SIMPLE MEASURES SAVE LIVES

EuroRAP 2011 Results
Leading Britain into the Decade of Action for Road Safety
“73 people on average, are killed or seriously injured on our roads every day”

“Safety engineering improvements are typically low cost and last decades”

“Simple, well known safety measures can pay back the costs of investment in 10 weeks”

CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forewords</td>
<td>3</td>
</tr>
<tr>
<td>Key findings</td>
<td>4</td>
</tr>
<tr>
<td>Tracking the safety performance of Britain’s motorways and A roads over a decade</td>
<td>10</td>
</tr>
<tr>
<td>Simple measures save lives</td>
<td>11</td>
</tr>
<tr>
<td>Improved roads</td>
<td>12</td>
</tr>
<tr>
<td>Persistently higher risk roads</td>
<td>16</td>
</tr>
<tr>
<td>Risk rating map of Britain’s motorways and A roads</td>
<td>18</td>
</tr>
<tr>
<td>High risk roads with motorcycles</td>
<td>24</td>
</tr>
<tr>
<td>High risk roads without motorcycles</td>
<td>26</td>
</tr>
<tr>
<td>Highest risk roads by region</td>
<td>28</td>
</tr>
<tr>
<td>Further information</td>
<td></td>
</tr>
<tr>
<td>About Risk Mapping</td>
<td>29</td>
</tr>
<tr>
<td>About Performance Tracking</td>
<td>30</td>
</tr>
<tr>
<td>About the Road Safety Foundation</td>
<td>30</td>
</tr>
<tr>
<td>About EuroRAP</td>
<td>30</td>
</tr>
<tr>
<td>Acknowledgments</td>
<td>31</td>
</tr>
</tbody>
</table>
The annual report from the Foundation on the safety of Britain’s main roads is now keenly awaited. Overall, it provides encouragement to Britain’s authorities. Our roads are getting safer over time and some authorities are doing well.

But the report is also disturbing. Road crashes cost up to 2.3% of GDP and the report confirms that we are failing to respond proportionately to the number of deaths and serious injuries and their cost. This report studies the busy high risk roads on which over half of road deaths are concentrated. It shows where simple, well known safety measures have been installed, paying back the costs of investment in an average of 10 weeks – a 500% rate of return in the first year alone.

This is however just the tip of the iceberg. The Foundation’s recent research report Saving Lives, Saving Money shows that attacking the problem systematically and achieving minimum 3-star safety levels on our A roads could achieve savings worth £35bn. Authorities could implement this programme during maintenance in the decade 2011-2020 at a cost of less than 10% of the roads budget.

In 2010, the Foundation received the Prince Michael Premier Road Safety Award for its work over the last decade in measuring the safety of our road infrastructure and making it transparent. The challenge for the next decade is to help authority leaders and public understand that it is no longer necessary to accept the tragedy of routine and predictable road deaths – busy high risk roads can be eliminated affordably with high economic returns.

For nearly a decade, Britain has been among pathfinding nations in seeking to measure systematically the risk posed to road users from road infrastructure. Practical support from Britain’s leading authorities means that the measured risk of death and serious injury on Britain’s motorways and main roads is now available across a 45,000km network. Results have been published annually since 2002 by the Road Safety Foundation, during which time improvements have been tracked, particularly progress in eliminating very high-risk sections of major routes.

The title of this year’s report – Simple Measures Save Lives – reflects the success of some road authorities in improving infrastructure safety. Over the last three years, the number of fatal crashes on motorways and A roads has dropped by 21%. Over the past decade average risk on Britain’s motorways and A roads has halved. While motorways and dual carriageways are moving towards the ‘low risk’ benchmark, the risk levels on non-primary single carriageway A roads in particular remain a cause for concern. These roads account for a large proportion of fatal and serious crashes and the majority of these routes are rated as ‘higher risk’.

We have worked with road authorities to demonstrate the importance to drivers of route consistency and predictability. We need to design out the hidden surprises that can result in tragic consequences.

On the top 15 most improved roads published in this report, affordable investment in measures to make routes more self-explaining and forgiving have contributed to a 62% drop in just three years, from 494 fatal and serious crashes to 190. This represents an economic saving of over £50 million annually (£130,000 per kilometre), to the costs borne by emergency services, the NHS, local authority care and by businesses and families.

This year marks the launch of the UN Decade of Action for Road Safety. The initiative aims to stabilise and then reduce the growing level of road traffic fatalities globally by 2020. This report provides crucial evidence about the safety levels achieved on Britain’s roads and the high social and economic returns which are there for the taking if we set priorities properly within existing roads and transport budgets.

Over the Decade, Britain should seek to achieve minimum safety levels on busy high risk roads as nations around the world look to us and other leading countries in road safety for guidance and support.
Key findings

30,000 killed on Britain's roads in the last decade

300,000 seriously injured in crashes on Britain's roads in the last decade

73 people, on average, are killed or seriously injured on our roads every day

11% The network assessed represents just 11% of Britain's road length but accounts for 54% of the traffic and over half the fatal crashes

21% reduction in the number of fatal crashes across Britain's motorways and A roads over the last three years

1% of Britain's motorways and A roads have shown a significant reduction in fatal and serious crashes

90% of motorways achieve the best possible safety standard, compared to 35% of duals and just 14% of single carriageways

8% of Britain's motorways and A roads have unacceptably high risk

65% of all fatal and serious crashes occur on single carriageways, 14% on mixed, 11% on duals and 10% on motorways

6 times Single carriageways have 6 times the risk of motorways and 3 times the risk of duals

1 in 48 primary A roads are rated as higher risk compared to 1 in 10 non-primary A roads

Twice Risk on motorways has improved at twice the rate of single carriageways

79% higher risk on non primary A roads compared to primary A roads

One-third of all fatal and serious crashes on motorways and A roads occur at junctions, 19% involve pedestrians and cyclists, 13% are head-ons, 8% involve single vehicles running off the road and 7% are rear-end shunts

5 times Britons face 5 times the risk of accidental death on the road than in any other daily activity

Half In the last 10 years average risk on motorways and A roads has halved moving from medium risk to low risk

Rear-end shunts account for a quarter of fatal and serious crashes on motorways
**Motorcyclists**
account for just 1% of traffic but 21% of all road deaths

**52%**
of all fatal and serious crashes involving a motorcyclist occur at junctions, 10% are head-ons, 6% shunts and 5% single vehicles running off the road

**1 in 4**
fatal and serious crashes on Britain's motorways and A roads involves a motorcyclist

**40 times**
Per kilometre travelled, motorcyclists are over 40 times more likely to be killed than car drivers

**North-West**
single carriageways carry one-third of the regions traffic but two thirds of fatal and serious crashes

**Scotland**
has the highest average risk rating in Britain, with lower levels of traffic carried over longer distances. 64% of the Scottish network is non-primary A road

**West Midlands**
is the safest region, with the lowest average risk rating and the smallest proportion of its network falling into the higher risk categories

**South-West England**
has the safest single carriageway roads of any region in Britain
Tracking the safety performance of Britain’s motorways and A roads over a decade

Since 2002, the Road Safety Foundation has been mapping and tracking the rate of death and serious injury on Britain’s motorways and main roads as part of the European Road Assessment Programme (EuroRAP). This year marks the tenth annual publication of results.

From 2002 until 2008, analysis included the primary route network – motorways and A roads – totalling 22,000kms. In 2009 the network was extended to include motorways and both primary and non-primary A roads. Covering 45,000kms, this represents just 11% of Britain’s road length, but carries 54% of the traffic. Half of all Britain’s fatal crashes occur on these roads.

- **Motorways**: major roads of regional and urban strategic importance, often used for long distance travel. Usually three or more lanes in each direction and generally have a maximum speed of 70mph.

- **Primary A roads**: include trunk roads (managed by national authorities), major roads forming the recommended routes for long-distance and freight traffic, and primary A roads (managed by local authorities). These busy through routes are connected in such a way that any part can be reached without leaving the network.

- **Non-primary A roads**: maintained by local authorities, these roads exist where the route is important but where a nearby primary A road or motorway duplicates the roads function.

The network excludes routes in urban cores, typically inside the inner ring road of major cities, where allocating crashes to specific roads is not straightforward, and where improvements to safety standards are very different to those in a rural setting.

For this report the crash and traffic data spanning 1997 to 2009 has been analysed. Trends over the past 5 and 10 years are presented. Figure 2 shows how the average risk rating has changed over time.

Based on rolling three-year data periods a steady drop is seen between 1997-99 and 2007-09, with the average risk of motorways and primary A roads showing an overall reduction of 48%. Over this time average risk rates have improved from the medium risk to low risk banding.

Data for motorways and all primary A roads have been collated from 2003-05 onwards. Figure 2 shows how the addition of non-primary A roads increase the average risk level by 28% compared to the equivalent measure for motorways and primary A roads. Once again, tracking performance shows a steady decrease in risk on this network, with the average rating dropping 11% over the past five years.

Figure 2. EuroRAP risk rating over time (no. fatal & serious crashes per bn veh km)

A comparison of the distribution of risk across the network reveals a positive shift to the lower risk categories (see Figure 3a). Motorways and primary A roads show little change over time with 45% and 48% respectively falling in the higher risk categories in 1997-99 and 2007-09.

A similar distribution is evident for motorways and all A roads over the past five years although the improvement has been more marked over time. In 2003-05, 40% of this network fell into the higher risk bandings. In the latest survey period this fell to 29%.
Tracking the safety performance of Britain’s motorways and A roads over a decade

Figure 3a. Evolution of risk distribution (motorways and primary A roads)

Figure 3b. Evolution of risk distribution (motorways and all A roads)

Table 1a gives the number of fatal and serious crashes and average risk rate by road type on motorways and primary A roads to pinpoint where the greatest crash savings have been made. The number of fatal and serious crashes on this network has dropped by 40%, with the greatest overall saving seen on mixed carriageways.

On the extended network including motorways and all A roads, fatal and serious crashes dropped by 18% between 2003-05 and 2007-09. All road types have seen a reduction in crash numbers during this period. Primary mixed carriageway A roads once again show the greatest reduction in both number of fatal and serious collisions (23%) and average risk rating (25%). Non-primary single carriageway A roads account for the highest proportion of fatal and serious crashes in both data periods (36% and 38% respectively), and show no change in average risk rating over time.

Table 1a. Trends in fatal and serious collisions and average risk rate by road type on motorways and primary A roads

<table>
<thead>
<tr>
<th></th>
<th>Number fatal &amp; serious collisions</th>
<th>Risk rate (no. fatal &amp; serious collisions per bn veh km)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1997-99</td>
<td>2007-09 % change</td>
</tr>
<tr>
<td>Motorways</td>
<td>3,078</td>
<td>2,558 -17</td>
</tr>
<tr>
<td>Primary A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dual</td>
<td>4,836</td>
<td>2,670 -45</td>
</tr>
<tr>
<td>Mixed</td>
<td>5,520</td>
<td>2,450 -57</td>
</tr>
<tr>
<td>Single</td>
<td>10,364</td>
<td>6,540 -37</td>
</tr>
</tbody>
</table>

Table 1b. Trends in fatal and serious collisions and average risk rate by road type on motorways and all A roads

<table>
<thead>
<tr>
<th></th>
<th>Number fatal &amp; serious collisions</th>
<th>Risk rate (no. fatal &amp; serious collisions per bn veh km)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2003-05</td>
<td>2007-09 % change</td>
</tr>
<tr>
<td>Motorways</td>
<td>3,094</td>
<td>2,558 -17</td>
</tr>
<tr>
<td>Primary A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dual</td>
<td>3,350</td>
<td>2,670 -20</td>
</tr>
<tr>
<td>Mixed</td>
<td>3,173</td>
<td>2,450 -23</td>
</tr>
<tr>
<td>Single</td>
<td>7,687</td>
<td>6,540 -15</td>
</tr>
<tr>
<td>Non-primary A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dual</td>
<td>590</td>
<td>520 -12</td>
</tr>
<tr>
<td>Mixed</td>
<td>1,430</td>
<td>1,256 -12</td>
</tr>
<tr>
<td>Single</td>
<td>10,980</td>
<td>9,599 -13</td>
</tr>
</tbody>
</table>
All the roads listed in this year’s top 15 most improved have implemented measures which make roads more self-explaining and forgiving.
Simple measures save lives

How safe a stretch of road is depends on a combination of drivers behaviour, the safety of the vehicle and the safety of the infrastructure.

The concept of “self-explaining and forgiving” roads formally entered leading international practice little more than a decade ago.

Drivers need to be presented with routes that are consistently treated and classes of road that are distinctive. Predictability and avoiding hidden surprises encourages road users to adopt driving behaviour well suited to the road and reduces the often small errors that can lead to fatal consequences.

Self-explaining design seeks to understand better the features which help drivers navigate the road network and, not least, choose the right speed.

The safety of road infrastructure depends on a road’s carriageway width, markings, signing, lighting, road surface and traffic management. It depends on separating fast moving streams of traffic and the provision of features which prevent high energy collisions, such as roadside barriers. The detailing of speed limits and other regulations (e.g. prohibiting overtaking at blind bends) must be fully fit for purpose.

Purpose-built motorways are designed from the outset to be self-explaining. The challenge is far greater on existing lower class roads where there may be pedestrians and cyclists in the traffic mix, as well as frequent accesses and development at the roadside.

All the roads listed in this year’s top 15 most improved have implemented measures which make roads more self-explaining and forgiving. These include:

- **speed limit reviews**, particularly the use of buffer zones which introduce gradual slowing of vehicles as users move from the rural to the more built-up areas of the network;
- **markings**, such as improvements to centre and edge lining and the use of hatched areas to warn against dangerous overtaking;
- **resurfacing**, particularly the use of high-friction anti-skid treatments at junctions and on bends;
- **signing**, including vehicle activated signs to warn of approaching hazards, interactive speed signs and clearer direction signs to guide users around the network.

Recent research has revealed the substantial economic returns achievable by upgrading existing infrastructure and ensuring that simple safety features such as safe roadsides and safe junction layouts are implemented on busy roads. This year’s most improved roads demonstrate vividly how huge savings in death, serious injury and economic cost arise.

Authorities following good practice should systematically assess possible road safety schemes for effectiveness in reducing crash numbers and find all those that represent a good investment return and responsible use of public money.

The value of engineering measures is commonly expressed in terms of a “first year rate of return”, where the value of crash savings up to one year after the introduction of measures is compared with the cost of the treatment. On average the schemes introduced on those roads listed in Table 2 were estimated to have achieved first year rates of return of 500% - in other words, the value of the crash savings achieved from the implementation of measures outweighed the costs five times over in a single year.

Research shows that these returns are only the tip of the iceberg. Every year Britain suffers serious injury crash costs alone of £0.5 billion on motorways, £1 billion on national trunk roads and £2.5 billion on local authority A roads.

Safety engineering improvements are typically low cost and last decades. Affordable investment to improve signing and lining and marry protection standards to the speed limit of the road can protect users from harm for 20 years, with nothing more than routine maintenance. Properly evaluated over the life of the measures, the returns from investment in safe road infrastructure are now difficult to ignore at a time when good investment decisions are demanded to promote economic growth and the nation’s social well-being.

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Improved roads

Improved roads are those where there has been a significant reduction in the number of fatal and serious crashes over time. Just 1% of the road sections analysed this year qualified.

The top 15 are shown in Table 2. On these alone the number of fatal and serious crashes has dropped from 494 to 190 – a 62% saving. Almost half of those listed are single carriageways, and are widely distributed across Britain.

Consultation with road authorities on sections listed found that common crash types included single vehicles losing control at bends, and rear-end collisions at junctions and during periods of congestion. The most common treatments included improvements to signing, markings and the design and layout of junctions, speed limit reviews and the use of speed enforcement, and resurfacing, including the use of anti-skid treatments on bends.

This year’s most improved road is an 11km section of the A4128 through Buckinghamshire leading from Great Missenden to the north to High Wycombe to the south.

Over the two survey periods, the route has moved from one of Britain’s highest risk roads with a medium-high risk (red) rating in 2004-06 to one of the safest, rated in 2007-09 as low-medium (yellow) risk. During this time, the number of fatal and serious collisions has dropped by 89%, from 19 to 2.

A non-primary A road, single carriageway along its entire length, the A4128 is a busy arterial route connecting local villages. Used as an alternative route to the A404 and the A4010, it carries commuter traffic to and from High Wycombe from the A413, Aylesbury, Chesham and north of the county. Permitted speeds are typically 30mph in villages and 40mph or 50mph between. Outside villages, the route is generally straight or gently curving and flat.

Buckinghamshire County Council has undertaken a number of measures to reduce crashes, including a review of speed limits. Speed restrictions were implemented in 2006, with short extensions of 30mph around the villages on the northerly section, and a 50mph restriction from the national speed limit on the southerly section of the route.

Road markings have been enhanced along the southerly part of the section to maximise visibility at night and during wet conditions.

A section of the road outside Hughenden Manor was also subject to a local safety scheme in 2006 to improve night time visibility with the use of solar-powered road studs following several fatal collisions. The studs automatically illuminate from dusk to dawn and are visible for up to ten times further than traditional retro-reflective studs, highlighting the road well beyond the headlight beam of a vehicle. The scheme includes the use of white studs to show centreline marking, red studs to show the side of the carriageway along high risk bends and a small number of green studs at lay-bys.
Fatal and serious crashes at junctions, accounting for 32% on the section in 2004-2006 were cut to zero in the later period. Those involving vehicles running off the road, accounting for 16%, were eliminated.

Closing the missing link in Britain’s motorway network

Of special note in this year’s results is the appearance of the M6 as the second most improved road. This 10km section operated by the Highways Agency, between the M6 at Carlisle and just south of the Scottish Border at Gretna saw an 87% reduction in the number of fatal and serious collisions between 2004-06 and 2007-09. It is now rated in the low-risk category.

The section of road was the only one not to motorway standard between the central belt of Scotland and England (and beyond to southern and eastern Europe).

In addition to providing important community links locally, it carries 75% of cross border traffic for heavy goods vehicles, commuters and tourists, at around 42,000 vehicles per day. Forming part of the Trans-European road network, heavy good vehicles make up 25% of all traffic carried. Prior to improvements the crash rate was 10% above the norm for a dual carriageway route.

The “Cumberland Gap”

From the 1960s onward the M6 was extended northwards and the route to and from Scotland underwent a gradual conversion to motorway standard to cope with growing volumes of traffic and the need for improved safety.

By 1992, the missing 10km section in England running up to the border began to gain notoriety and came to be known as the “Cumberland Gap”. It took some 16 years until, in 2008, the M6 was finally extended northwards.

At its northern end, the A74 was upgraded to motorway standard in the 1990s to bypass the larger towns in the area and eliminate the number of minor junctions along its length where low-speed local traffic precariously mixed with high-speed trunk road traffic.

Concern for the number of accidents and fatalities on the A74 route led to safety improvements throughout the 1970s, including the introduction of 1 metre hard shoulders at the side of the road and installation of crash barriers. Extra route confirmation signs were added to remind drivers that the road was not a motorway, and gaps in the central reservation were closed.

The upgrading of this section to motorway is a reminder that they are Britain’s safest roads and that there are safety dividends from upgrading deficits in safety features on busy dual carriageways.
### Improved roads

“Just 1% of Britain’s motorways and A roads showed a significant reduction in fatal and serious crashes.”

#### Table 2. Britain’s most improved roads (2004-2006 vs. 2007-2009)

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<tbody>
<tr>
<td>A4128*</td>
<td>High Wycombe – A413 (Great Missenden)</td>
<td>SE</td>
<td>11</td>
<td>Single</td>
<td>19</td>
<td>147</td>
<td>2</td>
<td>179</td>
<td>-89%</td>
<td>Speed limit review, improved directional and warning signs, improved road markings, intelligent road studs, traffic calming measures, upgrading pedestrian crossing facilities in villages</td>
</tr>
<tr>
<td>M6</td>
<td>J44 (Carlisle) – A74(M) (Gretna)</td>
<td>NW</td>
<td>10</td>
<td>Motorway</td>
<td>15</td>
<td>410</td>
<td>2</td>
<td>4.8</td>
<td>-87%</td>
<td>Upgrade from 2-lane dual carriageway to 3-lane motorway, 3m hard shoulder, junction improvements, local access road provided adjacent to route</td>
</tr>
<tr>
<td>A52</td>
<td>Nottingham ring road – Bingham</td>
<td>EM</td>
<td>13</td>
<td>Mixed</td>
<td>23</td>
<td>455</td>
<td>5</td>
<td>10.3</td>
<td>-78%</td>
<td>Average speed cameras, consistency of signing and markings, 50mph buffer zones between 40mph and NSL, central safety barriers</td>
</tr>
<tr>
<td>A985</td>
<td>Forth Bridge – Kincardine Bridge</td>
<td>Scotland</td>
<td>22</td>
<td>Single</td>
<td>22</td>
<td>76.8</td>
<td>5</td>
<td>18.9</td>
<td>-77%</td>
<td>Improved signing and lining approaching and at junctions, vehicle activated signs warning of approaching junction, pedestrian crossing</td>
</tr>
<tr>
<td>A1066</td>
<td>Thetford – Diss</td>
<td>E</td>
<td>31</td>
<td>Single</td>
<td>21</td>
<td>8.4</td>
<td>6</td>
<td>24.8</td>
<td>-71%</td>
<td>Centre hatching markings on non-overtaking sections, improved edge definition markings on lay-bys, vegetation clearance, signing improvements</td>
</tr>
<tr>
<td>A3102*</td>
<td>A350 (Melksham) – M4 J6 (Swindon)</td>
<td>SW</td>
<td>34</td>
<td>Single</td>
<td>23</td>
<td>64.4</td>
<td>7</td>
<td>19.8</td>
<td>-70%</td>
<td>Resurfacing, ladder markings on 30mph speed limit entering village, speed limit reduction on approach to villages</td>
</tr>
<tr>
<td>A632*</td>
<td>Chesterfield – A60 (Cuckney)</td>
<td>EM</td>
<td>20</td>
<td>Single</td>
<td>22</td>
<td>109.4</td>
<td>8</td>
<td>40.6</td>
<td>-64%</td>
<td>Signing &amp; lining improvements, re-surfacing, anti-skid surfacing, lighting improvements, drink drive education campaign for young drivers</td>
</tr>
<tr>
<td>A120</td>
<td>Puckeridge – Braintree</td>
<td>E</td>
<td>41</td>
<td>Mixed</td>
<td>27</td>
<td>25.0</td>
<td>10</td>
<td>7.7</td>
<td>-63%</td>
<td>Section of route dualled, local kerb re-alignment, additional warning signs, high friction surfacing, speed limit review, road marking improvements</td>
</tr>
<tr>
<td>M53</td>
<td>J1 (Bidston) – J12 (Chester)</td>
<td>NW</td>
<td>32</td>
<td>Motorway</td>
<td>36</td>
<td>18.1</td>
<td>15</td>
<td>7.2</td>
<td>-58%</td>
<td>Matrix signals upgraded, introduction of a central concrete barrier, Traffic Officer service introduced</td>
</tr>
<tr>
<td>A41, A515</td>
<td>Whitchurch – Chester</td>
<td>NW/WM</td>
<td>34</td>
<td>Single</td>
<td>33</td>
<td>73.4</td>
<td>14</td>
<td>33</td>
<td>-58%</td>
<td>High profile “Red Routes” campaign using signing to highlight levels of risk</td>
</tr>
<tr>
<td>A612*</td>
<td>A6011 (Nottingham) – A617 (Newark on Trent)</td>
<td>EM</td>
<td>27</td>
<td>Single</td>
<td>33</td>
<td>98.4</td>
<td>14</td>
<td>44.8</td>
<td>-58%</td>
<td>Improved signing, lining &amp; lighting, interactive speed signs, speed cameras, anti-skid surfacing</td>
</tr>
<tr>
<td>A1(M), A14</td>
<td>Cambridge – Alconbury</td>
<td>E</td>
<td>29</td>
<td>Dual</td>
<td>61</td>
<td>31.9</td>
<td>26</td>
<td>13.3</td>
<td>-57%</td>
<td>Introduction of average speed cameras</td>
</tr>
<tr>
<td>A466, A48</td>
<td>Chepstow – Gloucester</td>
<td>SW</td>
<td>45</td>
<td>Mixed</td>
<td>51</td>
<td>102.2</td>
<td>23</td>
<td>51.3</td>
<td>-55%</td>
<td>Resurfacing, including anti-skid at and on approach to the roundabout with M48, pedestrian refuge constructed</td>
</tr>
<tr>
<td>A30</td>
<td>Basingstoke – A322 (Bracknell)</td>
<td>SE</td>
<td>31</td>
<td>Mixed</td>
<td>49</td>
<td>83.5</td>
<td>24</td>
<td>42.0</td>
<td>-51%</td>
<td>Short sections of dual to single carriageway at junctions, anti-skid surfacing, vehicle activated signs and sign improvements</td>
</tr>
<tr>
<td>M8</td>
<td>J8 (Coatbridge) – J31 (Bishopton)</td>
<td>Scotland</td>
<td>38</td>
<td>Motorway</td>
<td>59</td>
<td>17.4</td>
<td>29</td>
<td>8.3</td>
<td>-51%</td>
<td>Reconstructing &amp; resurfacing carriageway &amp; hard shoulder, improvements to central safety barriers, lane layouts, signing, and anti-skid surfacing</td>
</tr>
</tbody>
</table>

Ranked by percentage reduction in the number of fatal or serious (F&S) crashes between 2004-06 and 2007-09; significant reduction in the number of F&S crashes between data periods at the 98% confidence level; section lengths are greater than 5.5 km; minimum of 8 F&S crashes 2004-06; minimum crash density of 1 F&S/mile 2004-06; * indicates roads classified as non-primary; road type accounting for at least 80% of section length; EuroRAP Risk Rating based on the number of fatal or 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 pre-publication consultation.
13

% F&S = percentage change in the number of fatal and serious collisions between 2003-05 and 2006-08

Figure 4. Britain’s most improved roads (2004-2006 vs. 2007-2009)

-87% F&S | Motorway | NW
M6, J44 (Carlisle) → A1(M) (Gretta)

-87% F&S | Motorway | NW
M8, J8 (Coatbridge) → J31 (Bishopston)

-77% F&S | Single | Scotland
A98, Forth Bridge → Kincardine Bridge

-64% F&S | Single | EM
A632, Chesterfield → A60 (Cuckney)

-87% F&S | Motorway | NW
M6, J44 (Carlisle) → A1(M) (Gretta)

-58% F&S | Motorway | NW
M53, J1 (Bidston) → J2 (Chester)

-58% F&S | Single | NW/WM
A41, A315 Whitchurch → Chester

-57% F&S | Motorway | NW
A52, Nottingham ring road → Bingham

-55% F&S | Mixed | SW
A466, A48 Chepstow → Gloucester

-55% F&S | Mixed | SW
A466, A48 Chepstow → Gloucester

-70% F&S | Single | SW
A302, A30 (Melksham) → M4 J16 (Swindon)

-51% F&S | Mixed | SE
A30, Basingstoke → A322 (Bracknell)

-89% F&S | Single | SE
A612, A6113 (Nottingham) → A69 (Newark on Trent)
Persistently higher risk roads

Persistently higher risk roads are those rated high or medium-high risk (black or red) in both data periods surveyed. They have shown little or no change over time. On the top 10 listed in Table 3, fatal and serious crashes have risen by 12%. Two of those listed have shown a reduction in the number of fatal or serious collisions between periods, but the change has not been reflected in the overall risk rating.

All are single carriageways, with 8 of the 10 being non-primary A roads. Risk on single carriageways is three times that of dual carriageways and 6 times that of motorways. Just 14% of single carriageways achieve the best possible safety standard, compared with 35% of duals and 90% of motorways.

The majority are concentrated in the North-West and East Midlands regions. The routes in these areas are rural single carriageway, challenging to drive with frequent blind corners and sweeping bends. Some are also scenic routes passing through national parks. Lighter traffic allows higher speeds and opportunities for safe overtaking can be restricted.

Head-on and junction crashes are predominant, together accounting for between one-third and three-quarters of all crashes. On average, single vehicles running off the road account for a further 10-20%. Measures implemented on these sections were generally aimed at reducing speeds.

The A537 Macclesfield to Buxton route has become notorious as Britain’s highest risk road, featuring in the top spot for the last four consecutive years of performance tracking. This challenging 12km route across the Peak District National Park has seen crashes rise by 62% in the last three years, with the equivalent of 3 crashes resulting in death or serious injury for every kilometre.

Bounded by dry stone walls or rock face for almost its entire length, the route is characterised by severe bends, uphill climbs and steep falls from the carriageway. The road’s elevation also means that weather conditions can change quickly and dramatically.


<table>
<thead>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A537</td>
<td>Macclesfield - Buxton</td>
<td>NW</td>
<td>12</td>
<td>Single</td>
<td>21</td>
<td>339.9</td>
<td>34</td>
<td>550.4</td>
<td>62%</td>
<td>3%</td>
<td>2.4%</td>
<td>12.4%</td>
<td>2.4%</td>
<td>0%</td>
<td>38%</td>
<td></td>
</tr>
<tr>
<td>A5012*</td>
<td>A513 (Pikehall) - A6 (Matlock)</td>
<td>EM</td>
<td>15</td>
<td>Single</td>
<td>12</td>
<td>222.9</td>
<td>20</td>
<td>345.1</td>
<td>67%</td>
<td>10%</td>
<td>30%</td>
<td>20%</td>
<td>10%</td>
<td>5%</td>
<td>25%</td>
<td></td>
</tr>
<tr>
<td>A621*</td>
<td>A619 (Baslow) - Totley</td>
<td>EM</td>
<td>9</td>
<td>Single</td>
<td>14</td>
<td>272.5</td>
<td>11</td>
<td>195.9</td>
<td>-21%</td>
<td>0%</td>
<td>18%</td>
<td>18%</td>
<td>18%</td>
<td>0%</td>
<td>45%</td>
<td></td>
</tr>
<tr>
<td>A62*</td>
<td>A633 (Calver) - Sheffield</td>
<td>EM/Y&amp;H</td>
<td>13</td>
<td>Single</td>
<td>9</td>
<td>177.7</td>
<td>9</td>
<td>194.6</td>
<td>0%</td>
<td>11%</td>
<td>4.4%</td>
<td>0%</td>
<td>11%</td>
<td>11%</td>
<td>22%</td>
<td></td>
</tr>
<tr>
<td>A5004*</td>
<td>Whaley Bridge (A6) - Buxton</td>
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<td>Single</td>
<td>13</td>
<td>199.5</td>
<td>13</td>
<td>193.5</td>
<td>0%</td>
<td>8%</td>
<td>8%</td>
<td>15%</td>
<td>0%</td>
<td>0%</td>
<td>69%</td>
<td></td>
</tr>
<tr>
<td>A54</td>
<td>Congleton - Buxton</td>
<td>NW</td>
<td>24</td>
<td>Single</td>
<td>19</td>
<td>165.8</td>
<td>21</td>
<td>180.6</td>
<td>11%</td>
<td>14%</td>
<td>10%</td>
<td>10%</td>
<td>19%</td>
<td>5%</td>
<td>43%</td>
<td></td>
</tr>
<tr>
<td>A530*</td>
<td>A525 (Whitchurch) - Nantwich</td>
<td>NW</td>
<td>13</td>
<td>Single</td>
<td>15</td>
<td>178.0</td>
<td>15</td>
<td>176.0</td>
<td>0%</td>
<td>13%</td>
<td>40%</td>
<td>13%</td>
<td>7%</td>
<td>0%</td>
<td>27%</td>
<td></td>
</tr>
<tr>
<td>A285*</td>
<td>A27 (Chichester) - A272 (Petworth)</td>
<td>SE</td>
<td>19</td>
<td>Single</td>
<td>15</td>
<td>132.4</td>
<td>18</td>
<td>161.6</td>
<td>20%</td>
<td>0%</td>
<td>33%</td>
<td>11%</td>
<td>28%</td>
<td>0%</td>
<td>28%</td>
<td></td>
</tr>
<tr>
<td>A581*</td>
<td>Asg (Rufford) - A49 (Chorley)</td>
<td>NW</td>
<td>11</td>
<td>Single</td>
<td>11</td>
<td>155.8</td>
<td>11</td>
<td>161.4</td>
<td>0%</td>
<td>0%</td>
<td>36%</td>
<td>18%</td>
<td>36%</td>
<td>0%</td>
<td>9%</td>
<td></td>
</tr>
<tr>
<td>A675*</td>
<td>M65 J3 (Blackburn) - Bolton</td>
<td>NW</td>
<td>13</td>
<td>Single</td>
<td>18</td>
<td>170.0</td>
<td>15</td>
<td>142.5</td>
<td>-17%</td>
<td>7%</td>
<td>20%</td>
<td>13%</td>
<td>33%</td>
<td>7%</td>
<td>20%</td>
<td></td>
</tr>
</tbody>
</table>

Ranked by EuroRAP Risk Rating 2007-09; no significant reduction in the number of F&S crashes between data periods; section lengths are greater than 5.5km; minimum number of 8 F&S crashes in 2004-06, 7 in 2007-09; minimum crash density of 1 F&S/mile in both data periods; EuroRAP Risk Rating above average of the medium-high (red) category or high risk (black) category in both data periods; * indicates roads classified as non-primary; ¹ road type accounting for at least 80% of section length; ² EuroRAP Risk Rating based on the number of fatal or serious crashes per billion vehicle km travelled: black (high risk), red (medium-high risk), orange (medium risk), yellow (low-medium risk), green (low risk); ³ percentages may not sum due to rounding. Some of the roads listed may have had measures implemented since 2009.

Risk on single carriageways is three times that of duals and 6 times that of motorways.
Figure 5. Britain’s persistently higher risk roads (2004-2006 & 2007-2009)

- A581, A59 (Rufford) to A49 (Chorley)
  - 11% F&S
  - Single NW
  - Rufford
  - Chorley

- A537, Macclesfield to Buxton
  - 62% F&S
  - Single NW
  - Macclesfield
  - Buxton

- A5004, Whaley Bridge (A6) to Buxton
  - 0% F&S
  - Single EM
  - Whaley Bridge
  - Buxton

- A625, A623 (Calver) to Sheffield
  - 0% F&S
  - Single EM/Y&H
  - Calver
  - Sheffield

- A621, A619 (Baslow) to Totley
  - 0% F&S
  - Single NW
  - Baslow
  - Totley

- A54, Congleton to Buxton
  - 11% F&S
  - Single NW
  - Congleton
  - Buxton

- A530, A525 (Whitchurch) to Nantwich
  - 0% F&S
  - Single NW
  - Whitchurch
  - Nantwich

- A285, A27 (Chichester) to A272 (Petworth)
  - 20% F&S
  - Single SE
  - Chichester
  - Petworth

- A5912, A515 (Pikehall) to A6 (Matlock)
  - 67% F&S
  - Single EM
  - Pikehall
  - Matlock

0% F&S = percentage change in the number of fatal and serious collisions between 2003-05 and 2006-08
The network assessed represents just 11% of Britain’s road length but accounts for 54% of the traffic and over half of the fatal crashes.

In the last 10 years, average risk on motorways and A roads has halved moving from medium risk to low risk.
90% of motorways achieve the best possible safety standard, compared to 35% of duals and just 14% of single carriageways.
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 2007-2009. Covering 45,000km in total, these roads represent just 11% of Britain’s road length but carry 54% of the traffic. Half of Britain’s fatal crashes occur on these roads.

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.

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 collision on the black road sections was more than 30 times higher than on the safest (green) roads.

For more information on the Road Safety Foundation go to [www.roadsafetyfoundation.org](http://www.roadsafetyfoundation.org).

For more information on the statistical background to this research, visit the EuroRAP website at [www.eurorap.org](http://www.eurorap.org).
Road Assessment Programme Risk Rating

- Low risk (safest) roads
- Low-medium risk roads
- Medium risk roads
- Medium-high risk roads
- High risk roads

- Motorway
- Single and dual carriageway
- Linking roads

Scale

0 10 20 30 40 50 60 80 kms
0 10 20 30 40 50 miles
This work forms part of the EU Road Safety Atlas Project supported by the EC in 2011. Collision information is for 2007-2009, the most recent available when the map was prepared. Traffic data is the average for 2007-2009 weighted by section length with local corrections where appropriate. The roads shown are based on the 2010 network but the map excludes the centres of major cities. No results are presented for roads shown in grey - these are either motorway spurs, connecting sections off the major route network, are short links, or roads that opened part way through the data period. 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.

© Road Safety Foundation 2011. The Foundation is indebted to the Department for Transport (DfT), the Scottish Government and the National Assembly for Wales for allowing use of data in creating the map. This work forms part of the EU Road Safety Atlas Project supported by the EC in 2011. Collision information is for 2007-2009, the most recent available when the map was prepared. Traffic data is the average for 2007-2009 weighted by section length with local corrections where appropriate. The roads shown are based on the 2010 network but the map excludes the centres of major cities. No results are presented for roads shown in grey - these are either motorway spurs, connecting sections off the major route network, are short links, or roads that opened part way through the data period. 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.

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Collision information is for 2006-2008, the most recent available when the map was prepared. Traffic data is for 2007 with local corrections where appropriate. The roads shown are based on the 2009 network but the map excludes the centres of major cities. No results are presented for roads shown in grey - these are either motorway spurs, connecting sections off the major route network, are short links, or roads that opened part way through the data period. 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.

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Motorcyclists account for just 1% of traffic but 21% of all road deaths

High risk roads with motorcycles

Road safety challenges can depend not only on how a road is designed and laid out but also on the type and mix of users and their behaviour. The vulnerability of riders to harm in the event of a crash often require different engineering, education and enforcement measures to those aimed at car occupants. Yet despite motorcyclists showing the greatest increase in traffic of all road users over the past decade, road infrastructure is generally designed with cars and heavier vehicles in mind.

During the past 15 years, the number of motorcycles in Britain has risen by 77%, now standing at 1.3 million licensed vehicles. More powerful machines are also becoming increasingly popular, with the proportion of those over 500cc now at 75% compared with 45% in 1999. Motorcycling is highly seasonal with usage doubling during the summer months.

Not normally protected by a rigid outer shell or secondary safety measures such as seatbelts or side impact bars typical in modern vehicles, fatalities amongst motorcyclists are falling slower than corresponding rates for all other road users.

Motorcyclists account for just 1% of Britain’s traffic but 21% of all road deaths (454) and 21% of all serious injuries (5,554). Per kilometre travelled, they are over 40 times more likely to be killed than car drivers. Over two-thirds of Britain’s motorcycle fatalities occur in rural areas.

Roads listed in Table 4 are the top ten high (black) or medium-high (red) risk roads in the latest survey period where at least 20% of the fatal and serious crashes involved a motorcyclist. They show where a combination of the proportion of motorcyclists travelling along the road, road-user behaviour and the road’s characteristics can contribute significantly to risk. All are single carriageways, with 5 of the 10 being non-primary A roads. Crashes at junctions are predominant.

The majority are concentrated in the North-West and East Midlands regions, in or near the Peak District National Park. Once again, the A337 from Macclesfield to Buxton heads this list. On this 12km section of single carriageway, 62% of all fatal and serious collisions involved a motorcyclist.

<table>
<thead>
<tr>
<th>Road no.</th>
<th>From – to description</th>
<th>Region/country</th>
<th>Length (km)</th>
<th>Road type</th>
<th>No. F&amp;S crashes involving motorcyclists (2007-09)</th>
<th>% of F&amp;S crashes on section</th>
<th>EuroRAP Risk Rating (all vehicles) (2007-09)</th>
<th>Contribution to EuroRAP Risk Rating from motorcyclists (2007-09)</th>
<th>% of F&amp;S crashes involving motorcyclists by type (2007-09)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A537</td>
<td>Macclesfield – Buxton</td>
<td>NW</td>
<td>12</td>
<td>Single</td>
<td>21</td>
<td>62%</td>
<td>530.4</td>
<td>0%</td>
<td>33%</td>
</tr>
<tr>
<td>A5012*</td>
<td>As5 (Pikehall) – A6 (Matlock)</td>
<td>EM</td>
<td>15</td>
<td>Single</td>
<td>15</td>
<td>75%</td>
<td>345.1</td>
<td>7%</td>
<td>20%</td>
</tr>
<tr>
<td>A5004*</td>
<td>Whaley Bridge (A6) – Buxton</td>
<td>EM</td>
<td>12</td>
<td>Single</td>
<td>9</td>
<td>69%</td>
<td>193.5</td>
<td>11%</td>
<td>78%</td>
</tr>
<tr>
<td>A621*</td>
<td>A619 (Baslow) – Totley</td>
<td>EM</td>
<td>9</td>
<td>Single</td>
<td>7</td>
<td>64%</td>
<td>195.9</td>
<td>14%</td>
<td>29%</td>
</tr>
<tr>
<td>A54</td>
<td>Congleton – Buxton</td>
<td>NW</td>
<td>24</td>
<td>Single</td>
<td>12</td>
<td>57%</td>
<td>180.8</td>
<td>17%</td>
<td>42%</td>
</tr>
<tr>
<td>A588*</td>
<td>A585 (Blackpool) – A6 (Lancaster)</td>
<td>NW</td>
<td>29</td>
<td>Single</td>
<td>11</td>
<td>52%</td>
<td>133.4</td>
<td>6%</td>
<td>18%</td>
</tr>
<tr>
<td>A371*</td>
<td>A303 (Wincanton) – A37 (Shepton Mallet)</td>
<td>SW</td>
<td>20</td>
<td>Single</td>
<td>6</td>
<td>38%</td>
<td>128.7</td>
<td>6%</td>
<td>13%</td>
</tr>
<tr>
<td>A21</td>
<td>A229 (Hurst Green) – Hastings</td>
<td>SE</td>
<td>23</td>
<td>Single</td>
<td>16</td>
<td>32%</td>
<td>141.1</td>
<td>19%</td>
<td>13%</td>
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<tr>
<td>A645</td>
<td>Knottingley – A1041</td>
<td>Y&amp;H</td>
<td>18</td>
<td>Single</td>
<td>6</td>
<td>29%</td>
<td>148.2</td>
<td>18%</td>
<td>17%</td>
</tr>
<tr>
<td>A646</td>
<td>Burnley – Halifax</td>
<td>NW/Y&amp;H</td>
<td>30</td>
<td>Single</td>
<td>11</td>
<td>24%</td>
<td>128.6</td>
<td>18%</td>
<td>27%</td>
</tr>
</tbody>
</table>

Table 4. Britain’s highest risk roads with high numbers of fatal or serious crashes involving motorcyclists (2007-2009)

Ranked by contribution to EuroRAP Risk Rating 2007-09. From motorcyclists; no significant reduction in the number of F&S crashes between data periods; section lengths are greater than 5.5 km; minimum number of 6 F&S crashes involving motorcyclists in both survey periods; minimum crash density (all vehicles) of 1 F&S/mile in 2007-09; EuroRAP Risk Rating (all vehicles) medium-high (red) or high (black) risk in 2007-09; 1% total of F&S crashes involving motorcyclists 2006 in 2007-09; contribution to EuroRAP Risk Rating from involving motorcyclists above average in 2007-09. * indicates roads classified as non-primary; † road type accounting for at least 80% of section length; ‡ EuroRAP Risk Rating based on the number of fatal or 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 2009. * DfT (2010). Reported Road Casualties Great Britain: 2009; DfT (2010). Motorcycling Statistics: Statistical Release, December 2010.
Figure 6. Britain's highest risk roads with high numbers of crashes involving motorcyclists (2007-2009)

- A5004, Whaley Bridge (A6) → Buxton
  - 69% F&S | Single | EM
  - 12km

- A537, Macclesfield → Buxton
  - 62% F&S | Single | NW
  - 12km

- A54, Congleton → Buxton
  - 57% F&S | Single | NW
  - 24km

- A5012, A515 (Pikehall) → A6 (Matlock)
  - 75% F&S | Single | EM
  - 15km

- A586, A585 (Blackpool) → A6 (Lancaster)
  - 52% F&S | Single | NW
  - 29km

- A646, Burnley → Halifax
  - 24% F&S | Single | NW/Y&H
  - 30km

- A645, Knottingley → A1041
  - 29% F&S | Single | Y&H
  - 18km

- A621, A69 (Baslow) → Totley
  - 64% F&S | Single | EM
  - 9km

- A21, A229 (Hurst Green) → Hastings
  - 32% F&S | Single | SE
  - 23km

- A371, A303 (Wincanton) → A37 (Shepton Mallet)
  - 38% F&S | Single | SW
  - 20km

% F&S = percentage of fatal and serious collisions involving motorcyclists (2007-09)
One in 48 primary A roads are rated higher risk compared with 1 in 10 non-primary A roads

Higher risk roads without motorcycles

Roads listed in Table 5 are the top ten highest risk (black or red) sections where collisions involving motorcyclists are excluded.

All are single carriageway roads and are concentrated in the North of the country: the North-West, Yorkshire and the Humber and the East Midlands.

Analysis of crashes and risk by road type over the latest 3 year data period reveals that 10% of single carriageways are rated higher risk compared to 3% of duals and 1% of motorways. Two-thirds of all fatal and serious crashes on the network outside towns and villages occurred on single carriageways.

Six of the ten roads listed are non-primary A roads. With a greater occurrence of small built-up areas regionally, risk on these routes is twice as high than on the strategic primary A route network. One in 48 primary A roads are rated as higher risk, compared to 1 in 10 non-primary A roads.

The contribution of the main crash types is shown. The high proportion of crashes at junctions and those involving pedestrians and cyclists indicate that these routes pass close to or through more built-up areas of the network such as villages and the outskirts of towns. Being of local importance, these routes tend to carry high traffic flows, a mix of road users and increased complexity in the road design and layout, with frequent changes in speed limits and the number and type of junctions. Junction crashes are often high speed and pedestrians and cyclists mix frequently with motorised traffic.

Table 5. Britain's highest risk roads when fatal or serious crashes involving motorcyclists are removed (2007-2009)

<table>
<thead>
<tr>
<th>Road no.</th>
<th>From - to description</th>
<th>Region/country</th>
<th>Length (km)</th>
<th>Road type</th>
<th>% of F&amp;S crashes not involving motorcyclists (2007-09)</th>
<th>% of F&amp;S crashes on section</th>
<th>EuroRAP Risk Rating (all vehicles) (2007-09)</th>
<th>Contribution to EuroRAP Risk Rating from motorcyclists (2007-09)</th>
<th>Pedestrians/cyclists</th>
<th>% of F&amp;S crashes not involving motorcyclists by type (2007-09)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A537</td>
<td>Macclesfield - Buxton</td>
<td>NW</td>
<td>12</td>
<td>Single</td>
<td>38%</td>
<td>580.4</td>
<td>210.5</td>
<td>8%</td>
<td>8%</td>
<td>15%</td>
</tr>
<tr>
<td>A16*</td>
<td>A16 (Ludborough) - A46 (Laceby)</td>
<td>EM/Y&amp;H</td>
<td>16</td>
<td>Single</td>
<td>82%</td>
<td>232.3</td>
<td>191.3</td>
<td>0%</td>
<td>14%</td>
<td>21%</td>
</tr>
<tr>
<td>A577*</td>
<td>Ormskirk - M58 J5 (Skelmersdale)</td>
<td>NW</td>
<td>12</td>
<td>Single</td>
<td>93%</td>
<td>162.9</td>
<td>152.1</td>
<td>50%</td>
<td>7%</td>
<td>7%</td>
</tr>
<tr>
<td>A65*</td>
<td>M65 J3 – Bolton</td>
<td>NW</td>
<td>13</td>
<td>Single</td>
<td>93%</td>
<td>142.5</td>
<td>133.0</td>
<td>7%</td>
<td>14%</td>
<td>14%</td>
</tr>
<tr>
<td>A1101</td>
<td>A1122 (Outwell) - A17 (Long Sutton)</td>
<td>EM/E</td>
<td>21</td>
<td>Single</td>
<td>90%</td>
<td>141.7</td>
<td>128.0</td>
<td>39%</td>
<td>14%</td>
<td>4%</td>
</tr>
<tr>
<td>A642*</td>
<td>M62 J30 - A61 (Wakefield)</td>
<td>Y&amp;H</td>
<td>6</td>
<td>Single</td>
<td>71%</td>
<td>167.2</td>
<td>119.4</td>
<td>50%</td>
<td>7%</td>
<td>0%</td>
</tr>
<tr>
<td>A60*</td>
<td>A57 (Worksop) - A631 (Tickhill)</td>
<td>EM</td>
<td>15</td>
<td>Single</td>
<td>78%</td>
<td>138.9</td>
<td>108.0</td>
<td>29%</td>
<td>29%</td>
<td>7%</td>
</tr>
<tr>
<td>A645</td>
<td>Knottingley - A104</td>
<td>Y&amp;H</td>
<td>18</td>
<td>Single</td>
<td>71%</td>
<td>148.2</td>
<td>105.9</td>
<td>47%</td>
<td>40%</td>
<td>0%</td>
</tr>
<tr>
<td>A530*</td>
<td>A525 (Whitchurch) - Nantwich</td>
<td>NW</td>
<td>13</td>
<td>Single</td>
<td>60%</td>
<td>176.0</td>
<td>105.6</td>
<td>22%</td>
<td>22%</td>
<td>22%</td>
</tr>
<tr>
<td>A21</td>
<td>A229 (Hurst Green) - Hastings</td>
<td>SE</td>
<td>23</td>
<td>Single</td>
<td>68%</td>
<td>141.1</td>
<td>95.9</td>
<td>29%</td>
<td>21%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Ranked by contribution to EuroRAP Risk Rating 2007-09. From non-motorcyclists; no significant reduction in the number of F&S crashes between data periods; section lengths are greater than 5.5km; minimum number of 6 F&S crashes not involving motorcyclists in 2004-06, 5 in 2007-09; minimum crash density (all vehicles) of 1 F&S/km in 2007-09; EuroRAP Risk Rating (all vehicles) medium-high (red) or high (black) risk in both survey periods; contribution to EuroRAP Risk Rating from F&S not involving motorcyclists above average in both data periods; * indicates roads classified as non-primary; 1 road type accounting for at least 80% of section length; 1 EuroRAP Risk Rating based on the number of fatal or 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 2009.
Figure 7. Britain's highest risk roads excluding fatal or serious crashes involving motorcyclists (2007-2009)

- A642, M62 J30 → A61 (Wakefield)
  - 71% F&S
  - Single
  - Y&H
  - 6km

- A645, Knottingley → A104
  - 71% F&S
  - Single
  - Y&H
  - 18km

- A18, A16 (Ludborough) → A46 (Laceby)
  - 68% F&S
  - Single
  - Y&H
  - 16km

- A60, A57 (Worksop) → A651 (Tickhill)
  - 82% F&S
  - Single
  - EM/Y&H
  - 15km

- A61 (Wakefield)
  - 71% F&S
  - Single
  - Y&H
  - 21km

- A577, Ormskirk → M58 J5 (Skelmersdale)
  - 93% F&S
  - Single
  - NW
  - 12km

- A537, Macclesfield → Buxton
  - 38% F&S
  - Single
  - NW
  - 13km

- A530, A325 (Whitchurch) → Nantwich
  - 60% F&S
  - Single
  - NW
  - 13km

- A350, A57 (Whitchurch) → Nantwich
  - 68% F&S
  - Single
  - EM
  - 18km

- A350, A325 (Whitchurch) → Nantwich
  - 60% F&S
  - Single
  - NW
  - 13km

- A46 (Laceby)
  - 90% F&S
  - Single
  - NW
  - 21km

- A21, A239 (Hurst Green) → Hastings
  - 68% F&S
  - Single
  - SE
  - 23km
Single carriageways in the North-West carry one-third of the region’s traffic but two-thirds of the fatal and serious crashes.

### Higher risk roads by region

Table 6 shows the highest risk road in each of the regions, Scotland and Wales. Roads listed are ranked by their EuroRAP risk rating from highest to lowest. Short sections and those with low crash numbers have been excluded.

Roads in the North-West, Scotland and East Midlands top this list, each with sections rated in the highest risk (black) category. The A695 in the North-East is the only section falling outside of the higher risk categories.

All are single carriageways, with 9 of the 10 being non-primary A roads. Single carriageways in the North-West carry one-third of the region’s traffic but account for two-thirds of fatal and serious crashes. The South-West has the safest single carriageways of any region in Britain.

Scotland has the highest average risk rating with 64% of its network length being non-primary A roads. The West Midlands is the safest, with the lowest average risk rating and the smallest proportion of its network falling into the higher risk categories.

The number of fatal and serious crashes on these 10 roads alone has increased by 80% between 2004-06 and 2007-09, from 84 to 150. This contrasts with a 21% reduction in the number of fatal crashes across Britain’s motorways and A roads in the last three years and a 12% drop in average risk.

EuroRAP Risk Mapping for each of the regions can be downloaded from www.roadsafetyfoundation.org.

#### Table 6. Britain’s highest risk roads by region (2007-2009)

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</tr>
</thead>
<tbody>
<tr>
<td>North West</td>
<td>A537</td>
<td>Macclesfield - Buxton</td>
<td>12</td>
<td>Single</td>
<td>34</td>
<td>62%</td>
<td>559.4</td>
<td>3%</td>
<td>24%</td>
<td>12%</td>
<td>24%</td>
<td>0%</td>
<td>38%</td>
</tr>
<tr>
<td>Scotland</td>
<td>A708*</td>
<td>Moffat - Selkirk</td>
<td>52</td>
<td>Single</td>
<td>12</td>
<td>140%</td>
<td>373.0</td>
<td>0%</td>
<td>0%</td>
<td>3%</td>
<td>33%</td>
<td>0%</td>
<td>33%</td>
</tr>
<tr>
<td>East Midlands</td>
<td>A5012*</td>
<td>A515 (Pikehall) - A6  (Matlock)</td>
<td>15</td>
<td>Single</td>
<td>20</td>
<td>67%</td>
<td>345.1</td>
<td>10%</td>
<td>30%</td>
<td>20%</td>
<td>10%</td>
<td>5%</td>
<td>25%</td>
</tr>
<tr>
<td>Wales</td>
<td>A542*</td>
<td>Llangollen - A525</td>
<td>13</td>
<td>Single</td>
<td>8</td>
<td>167%</td>
<td>189.5</td>
<td>13%</td>
<td>13%</td>
<td>38%</td>
<td>38%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Yorkshire &amp; the Humber</td>
<td>A696*</td>
<td>M62 J32 (Castleford) - A63 (Garforth)</td>
<td>8</td>
<td>Single</td>
<td>18</td>
<td>100%</td>
<td>175.7</td>
<td>28%</td>
<td>39%</td>
<td>0%</td>
<td>22%</td>
<td>11%</td>
<td>0%</td>
</tr>
<tr>
<td>East of England</td>
<td>A4012*</td>
<td>A905 (Leighton Buzzard) - A5 (Hockliffe)</td>
<td>8</td>
<td>Single</td>
<td>7</td>
<td>250%</td>
<td>162.9</td>
<td>14%</td>
<td>29%</td>
<td>14%</td>
<td>29%</td>
<td>0%</td>
<td>14%</td>
</tr>
<tr>
<td>South East</td>
<td>A285*</td>
<td>A27 (Chichester) - A272 (Petworth)</td>
<td>19</td>
<td>Single</td>
<td>18</td>
<td>20%</td>
<td>161.6</td>
<td>0%</td>
<td>33%</td>
<td>11%</td>
<td>28%</td>
<td>0%</td>
<td>28%</td>
</tr>
<tr>
<td>South West</td>
<td>A371*</td>
<td>A303 (Wincanton) - A37 (Shepton Mallet)</td>
<td>20</td>
<td>Single</td>
<td>16</td>
<td>33%</td>
<td>128.7</td>
<td>6%</td>
<td>38%</td>
<td>13%</td>
<td>38%</td>
<td>0%</td>
<td>6%</td>
</tr>
<tr>
<td>West Midlands</td>
<td>A422*</td>
<td>A429 (Ettington) - A46 (Stratford upon Avon)</td>
<td>11</td>
<td>Single</td>
<td>10</td>
<td>233%</td>
<td>123.8</td>
<td>60%</td>
<td>10%</td>
<td>20%</td>
<td>0%</td>
<td>10%</td>
<td>0%</td>
</tr>
<tr>
<td>North East</td>
<td>A695*</td>
<td>A69 (Hexham) - A68 (Riding Mill)</td>
<td>13</td>
<td>Single</td>
<td>7</td>
<td>250%</td>
<td>99.4</td>
<td>0%</td>
<td>71%</td>
<td>0%</td>
<td>29%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Ranked by EuroRAP Risk Rating 2007-09; section lengths are greater than 5.5km; minimum number of 7 F&S crashes in 2007-09; * indicates roads classified as non-primary; 1 road type accounting for at least 80% of section length; EuroRAP Risk Rating based on the number of fatal or 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 2009.
About Risk Mapping

In countries where detailed crash and traffic data are available, EuroRAP risk maps give an objective view of where people are being killed or seriously injured on a road network and where their crash risk is greatest. By showing the number of fatal and serious collisions per kilometre travelled the results demonstrate the risk arising from the interaction of road users, vehicles and the road environment.

The emphasis of Risk Mapping is on identifying high-risk routes rather than ‘blackspots’ or ‘cluster sites’. The costs of proactively treating known areas of high risks by upgrading the safety detailing along a length of road are often far lower than piecemeal change once a collision has occurred.

Risk maps help to create awareness and understanding of road safety risk as users move around a network. They are being increasingly adopted by road authorities and Governments across Europe as a way of prioritising network improvements and leveraging the funds required to take action.

The mapping in this report has been produced to a standardised methodology, making it possible to identify the lowest and highest risk sections nationwide. By comparing risk by region, they also provide consistent safety ratings of roads across borders. Risk Mapping is now available in over 20 countries across Europe.

Given that the majority of fatal and serious collisions happen outside major towns and cities, EuroRAP Risk Mapping concentrates on rural roads. Typically, national programmes map higher tier roads first, where data are most often available, developing to regional roads over time.

The methodology used here compares the number of collisions resulting in death or serious injury on a road with how much traffic it carries. This takes account of an individual road user’s exposure to risk. For example, a length of road with 20 fatal and serious collisions and carrying 10,000 vehicles per day will have a risk 10 times higher than a road with the same number of collisions but carrying 100,000 vehicles per day.

Motorways can have high crash numbers but they also carry the majority of the traffic, giving an overall small exposure to risk for any one road user. On the measure of the number of collisions by vehicle kilometres travelled, a road with relatively few fatal and serious collisions can be rated as higher risk if it carries low volumes of traffic.

Road networks are aggregated into sections where they fall along the same numbered road and where design and operation is uniform. Crash and traffic data are assigned to each section, compiled into three-year periods to minimise year-to-year fluctuations.

Sections are allocated into colour-coded categories from high risk to low risk.

The Risk Mapping shown in this year’s report uses the most up-to-date collision and traffic data available for Great Britain (2007-2009 inclusive). Collision data are from the national road injury and accidents (STATS19) database provided by the Department for Transport. Traffic flows are from the Department for Transport database based on automatic and manual vehicle counts, the latter carried out at three-yearly intervals.

Recognising that the view of road safety differs depending on the target audience, different maps can be produced, using the same basic crash and traffic flow data:

- Crashes per kilometre, used by road authorities to reflect more broadly how the total risk to all road-users is distributed across a network;
- Crash costs borne by society and the economy;
- Potential crash savings showing the opportunity for improvement from Safer Roads Investment Programmes.

Risk Mapping for those with colour vision deficiency is also available to download from www.roadsafetyfoundation.org.
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 Foundation 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 decade the charity has focused on leading the establishment of the European Road Assessment Programme (EuroRAP) in the UK and internationally. Since the inception of EuroRAP in 1999, the Foundation has been the member responsible for managing the programme in the UK (and, more recently, Ireland), ensuring that we provide a global model of what can be achieved.

The 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 which can be understood by the general public, policy makers and professionals;
- issuing guidance on the use of EuroRAP protocols at operational level by road authorities in order for engineers to improve the safety of the road infrastructure for which they are responsible;
- proposing national strategies and benchmarks.

For more information visit www.roadsafetyfoundation.org

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About EuroRAP

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

The programme aims 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, motoring organisations, vehicle manufacturers and road authorities, and aims to ensure that assessment of risk lies at the heart of strategic decisions on route improvements, crash protection and standards of route management.

Its Members are automobile and touring clubs, national and regional road authorities and researchers. The programme is supported by the FIA Foundation for the Automobile and Society, the European Commission, the International Road Assessment Programme, motor industry, and governments.

For more information visit www.eurorap.org.

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Acknowledgements

Crash data are from the STATS19 national road injury and accident database provided by the Department for Transport (DfT), and include all crashes resulting in fatal and serious injuries during the data periods 2004-2006 and 2007-2009 inclusive, the most recent available when the results were prepared. Traffic flow data are from the DfT database which collates automatic and manual vehicle counts, the latter carried out at three-yearly intervals. Values used for individual road sections are the average for the data periods 2004-2006 and 2007-2009 (inclusive) weighted by section length. The detailed data used to produce these results was commissioned from TRL Limited and included the creation of the British EuroRAP network of road sections, assignment of crashes and traffic data to individual routes and classification of crash types.

The British EuroRAP programme is managed by Dr Joanne Hill. Analysis and validation was carried out Dr Joanne Hill and Caroline Starrs (Road Safety Foundation). Pre-publication consultation with road authorities on roads listed in the report was carried out by Caroline Starrs and Neil Moss (Road Safety Foundation). Cartography was carried out by Nick Moss (Road Safety Foundation), using Digital Map Data (c) Collins Bartholomew Ltd (2010). Regional mapping contains Ordnance Survey data (c) Crown Copyright and database right 2010. Images courtesy of Neil Moss, Astucia, Roger Savage Photography and Cheshire East Council.

This work forms part of the EC Road Safety Atlas Project financially supported by the European Commission in 2011. The Foundation would like to thank those road authorities who responded to pre-publication consultation of the results and who have provided detailed information on specific road sections listed.

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.
For nearly a decade, Britain has been among pathfinding nations in seeking to systematically measure the risk posed to road users from road infrastructure. Measured risk of death and serious injury on Britain’s motorways and main roads is now available – where over half of road deaths occur. Results have been published annually since 2002 by the Road Safety Foundation, during which time improvements have been tracked, particularly progress in eliminating very high-risk sections of major routes.

**Simple Measures Save Lives** details the challenges and success stories in reducing the most serious crashes. It underlines the importance of designing out hidden surprises with self-explaining and forgiving roads. It shows how affordable investment in simple measures has made major contributions in achieving the best possible safety standards.

Just 1% of Britain’s roads have shown a significant improvement in fatal and serious crashes. On the top 15, crash numbers have dropped from 494 to 190 – a 62% saving, an annual cost saving of £56 million. Once implemented improvements to signing, markings and surfacing, and matching permitted speeds to road design and function will protect users from harm for decades with nothing more than routine maintenance required.

But the report reveals roads where risk can be 30 times higher than the safest routes. Single carriageways, particularly local routes away from the strategic network, are a particular cause for concern, failing to show the rate of improvement evident for motorways and dual carriageways.

The challenge for the next decade is to help authority leaders and the public understand that the tragedy of routine and predictable road deaths need not be accepted. Over the Decade of Action for Road Safety (2011-2020) we call for minimum safety standards on our busy high risk roads, and will work to demonstrate how affordable investment can benefit economic growth and social well-being.