

RIDEFREE

Refreshing our approach to motorcycle safety



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to motorcycle
safety**

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Introduction

Highways England works with partner organisations in each region of the country through Regional Safety Co-ordinators, to enhance the safety of road users on its Strategic Road Network and local roads. Highways England has responsibility for the safe design, operation and maintenance of its network, whilst this responsibility falls to local highways authorities for other roads. If road users are lacking in knowledge about road safety or have poor attitudes towards how they should behave when driving, riding or walking, it doesn't matter if they are using local or Highways England roads and often journeys straddle both types of network. Instead, improvements in behaviours are of benefit to all by reducing risk across the road network.

Influencing the behaviours of road users is therefore a joint responsibility with collaboration in road safety also more likely to be more effective, with consistent messages delivered across partners, using the most appropriate delivery methods. It can also achieve economies of scale and encourage best practice and evidence-led working.

In the East of England, Highways England therefore works with road safety partnerships comprising of local authorities, police forces and fire and rescue services to achieve the common aim of reducing the risk of injury collisions on the region's roads. One of the highest risk road user groups is motorcyclists, which are the focus of this project.

This report is comprised of four separate but related documents which take the reader from the starting point of identifying a collision issue through to piloting an intervention to address it. The reader is encouraged to read all four sections to understand the processes involved and the rationale behind the pilot intervention. The sections are:

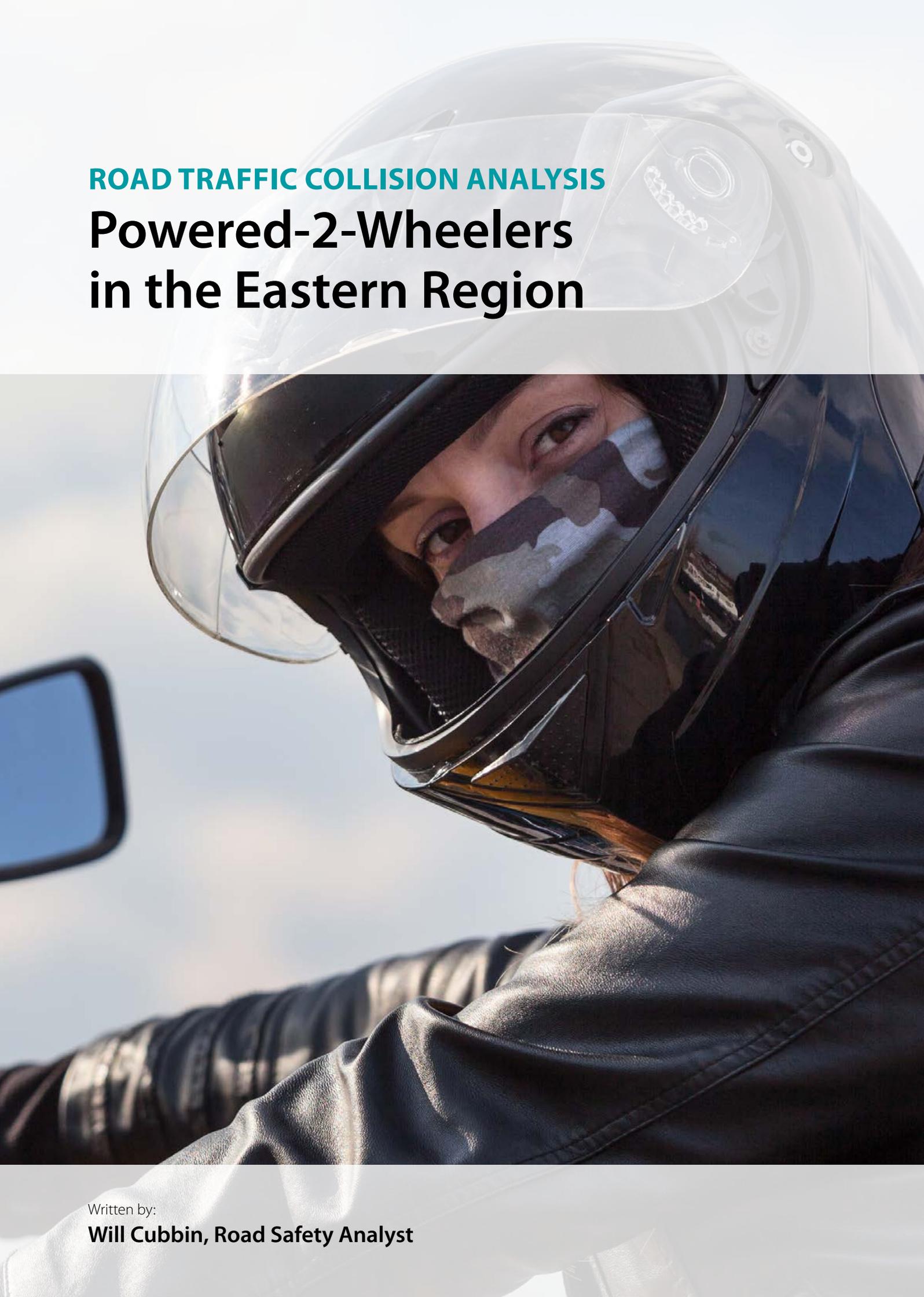
- RSA-17-319 P2W riders in the Eastern Region **Page 1**
- Motorcycling Service Delivery Review **Page 67**
- Young Riders Double Diamond **Page 109**
- RideFree Trial Findings **Page 137**

The project started with a need to understand how motorcyclists are involved in collisions in the East of England. The first section of this report, *RSA-17-319 P2W riders in the Eastern Region*, is a detailed analysis of when, where and how motorcyclists are involved in collisions and who those motorcyclists are. The analysis was undertaken by Will Cubbin of the Safer Essex Roads Partnership and was an essential starting point for understanding motorcycle collisions.

This section is followed by a *Motorcycle Service Delivery Review*, which was an exercise undertaken across the region by Road Safety Analysis to identify the road safety activities delivered in the East to reduce motorcycle collision risk. It identified gaps and duplications in delivery; assessed the evaluation results of interventions; and compared the target audiences of activities with the collision analysis to ensure the focus of messages were appropriate. A major conclusion was that young riders warranted stronger attention in interventions, leading to the next stage in the process.

The *Young Riders Double Diamond* section details a two-day workshop facilitated by Road Safety Analysis and attended by road safety partners in the East to perform a behavioural diagnosis of the risks facing young motorcyclists. It culminated in recommendations on the types of behaviours that could be targeted in interventions and provided suggestions on how those might be delivered.

The final section of this report, *RideFree Trial Findings*, presents the findings of a trial undertaken in the East by Road Safety Analysis and Agilysis, working with academics, researchers, road safety stakeholders and Government agencies to examine the effectiveness of four versions of Compulsory Basic Training (CBT) for young novice riders. The trial was founded on all of the evidence presented throughout this report, ensuring the final output from the two-year project was tailored to address the problem behaviours identified in the collision analysis, the review of existing interventions and the behavioural diagnosis.



ROAD TRAFFIC COLLISION ANALYSIS

Powered-2-Wheelers in the Eastern Region

Written by:

Will Cubbin, Road Safety Analyst

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Executive summary

The aim of this document is to provide an analysis of fatal and serious-injury collisions involving powered-2-wheelers (P2W) in the Eastern Region. This is to support a Highways England led initiative to reduce the number of P2W riders killed or seriously injured (KSI) on all roads across the region.

This document draws on published STATS19 collision data for the Eastern Region, spanning the most recent 5 year period available which is from 2011-2015. The trends identified in this document are long-term in nature, suggesting they will continue into 2017 and beyond if left unchecked. This document also uses other datasets that help understand rider profiles and demographics. It examines *riders* (as opposed to casualties) involved in KSI collisions in order to determine trends in risk resulting from the net-effect of exposure and behaviour. The vast majority (96%) of P2W riders involved in KSI collisions are themselves a KSI casualty¹, so understanding the role of the rider is an effective way of understanding the casualty.

Riders of powered-2-wheelers are consistently and considerably over represented in KSI collisions compared to other types of road user. These collisions cost the public sector in the Eastern Region £38 million per year, and although rider risk has reduced since the early 1990s, this reduction has been at a slower rate than it has been for other road users.

The analysis identifies three main rider groups, which between them are involved in 76% of P2W KSI collisions. The group termed “Young Riders” are aged 16-25 and tend to ride relatively short distances on low capacity bikes in the urban areas where they live and have most of their collisions. “Commuters” are aged 26-65 and have their collisions on weekdays, mostly during morning and afternoon commuting times on urban roads. “Leisure Riders” are mainly aged 26-55 and are the group most likely to have collisions on rural roads, riding bikes with 500cc+ engines, at the weekend.

Average engine capacity, proportion of KSI on rural roads, and severity ratio², all increase with rider age until riders reach their late 50s. These trends are reversed for the small number of riders aged 60+, but only slightly. Younger riders tend to live in more deprived areas, ride smaller capacity bikes, and are more likely to have collisions in winter, compared to middle aged and older riders.

Overall 56% of P2W KSI are on urban roads, with the biggest urban-road issue being collisions at junctions involving other vehicles³, often when the other driver is making a right hand turn and failing to give way to the motorcycle. Errors made by P2W riders most frequently lead to rear-end collisions with other vehicles, head-on collisions when overtaking, loss of control (both with and without the involvement of other vehicles), and collisions when filtering through heavy traffic.

Large urban areas have the greatest concentration of P2W KSI collisions, and these are most likely to occur during weekday commuting times. There is a smaller, secondary issue involving larger capacity bikes, often on rural roads during the afternoons at the weekend.

¹ The remaining 4% are involved in KSI collisions where one or more pedestrian, other vehicle occupant or other P2W rider is injured. They themselves may be uninjured or suffer a slight injury.

² The proportion of all casualties which are fatal or serious.

³ “Other vehicles” defined as all motorised traffic, excluding other P2Ws. 86% of “other vehicles” are cars, and 7% are vans.

Conclusions & Recommendations

- 1 The following areas have specific local issues with P2W casualties; Norwich, Bedford, Colchester, Ipswich, Southend-on-Sea, Epping Forest, Hertsmere and Three Rivers. These eight areas account for 20% of the KSI collisions analysed for this report.

Recommendation: *Use the local profile documents available from the author, for the areas listed above, to inform bespoke local interventions.*

- 2 P2W KSI collisions are geographically most concentrated in urban areas; 56% of P2W KSI take place on urban roads. All types of rider are involved in urban collisions, although collisions on urban roads are the ones most likely to involve the smaller bikes most commonly ridden by younger riders, or take place during weekday commuting times. Most of these collisions involve another vehicle (usually a car), often turning right at a junction into the path of a P2W, or failing to give way at a roundabout. Where P2W riders contribute to collisions involving other vehicles it is often when carrying out a manoeuvre such as overtaking, filtering through slower or stationary traffic, or running into the rear of vehicles when traffic is slowing or stopping. Peak times for urban collisions are usually during afternoon commuting times on weekdays.

Recommendation: *Enforcement activity addressing driver distraction and poor manoeuvres by drivers and riders to concentrate on urban areas during afternoon commuting times.*

Recommendation: *Publicity campaign to encourage other vehicle drivers to look out for motorcycles, particularly at junctions.*

Recommendation: *Consider campaign to lobby for the introduction of a “vulnerable road users” element to the driving test, requiring new drivers to demonstrate an understanding of how to fulfil their duty of care to vulnerable road users, including P2W riders.*

Recommendation: *Campaign aimed at normalising good practice for P2W riders when riding on busy urban roads, such as safe filtering/overtaking and avoiding rear end collisions with slowing traffic. Campaign media and content to be tailored for main Mosaic groups identified in this document.*

- 3 Middle aged riders have the lowest individual rider risk per vehicle mile, but they are the most numerous on the road. They are the group most likely to ride 500cc+ bikes and are prevalent in the rural road collisions most likely to result in serious or fatal injuries. Causes of rural road collisions away from junctions are more likely to be attributed to the P2W rider than drivers of other vehicles. Loss of control, including on bends, is a common type of collision and is consistent with excess speed. It is likely these riders know the risks, and enjoy the risks, so simply discouraging excess speed is unlikely to have a long term impact outside of a specific speed enforcement campaign. Better riding skills, road craft and judgement of potential hazards may be the best way of preventing rider behaviour turning into KSI casualties.

Recommendation: *Rear facing average speed systems to be considered for routes identified in figure 13 on page 16 of this document.*

Recommendation: *Campaign to increase participation in rider skills courses, focussing on road craft and hazard perception, using main Mosaic groups identified in this document to help target engagement.*

- 4 Young riders are a very high risk group but many only ride a P2W for a few years, which may disincentivise investment in training and equipment for some. Inexperience and careless or reckless behaviours appear to be the root cause of the mainly urban collisions young riders are involved in. This group are most over represented in low income areas.

Recommendation: *Create and incentivise participation in road craft, bike handling and hazard perception training tailored for young riders.*

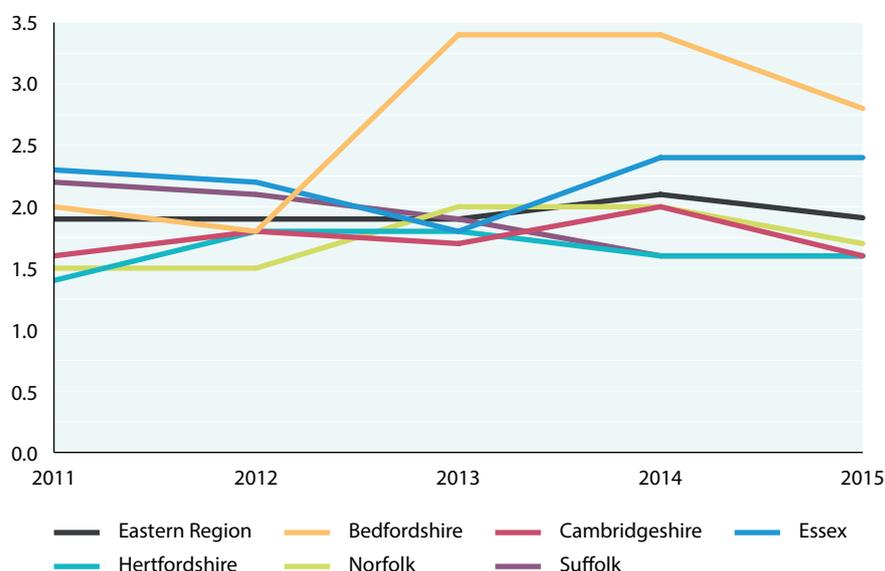
Recommendation: Publicity and engagement materials to be designed to appeal to young males, particularly those living in lower income areas.

Background

Prevalence

The chart below shows that with the exception of Bedfordshire and Essex, there are around 1.5-2.0 P2W riders involved in a KSI collision per million vehicle miles. Since 2012/2013 Bedfordshire and Essex have seen an increase in the rate of P2W riders involved in KSI collisions on their roads.

Figure 1: P2W KSI collision involvements per vehicle mile

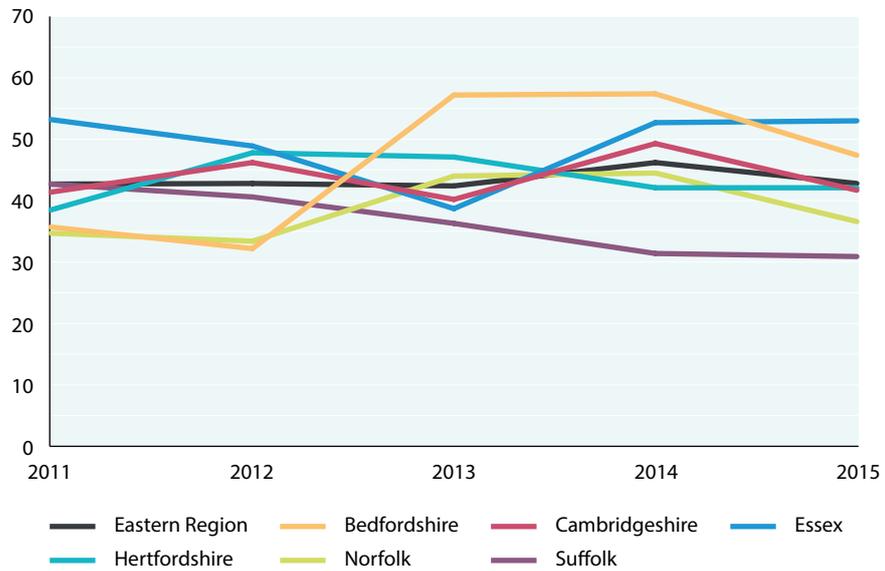


It is important to note that vehicle mileage data is derived by applying national travel survey data to local population estimates. This can result in a loss of accuracy for smaller areas, or areas with different demographics and geography to the UK average – a higher than average rate of P2W owner/ridership in a local area may result in an artificially inflated rate of collisions-per-vehicle-mile.

To adjust for this effect we can use an alternative measure of “P2Ws in KSI collisions per registered bike” (using DVLA registration data⁴). This gives the following chart:

⁴ See appendix for DVLA registration data.

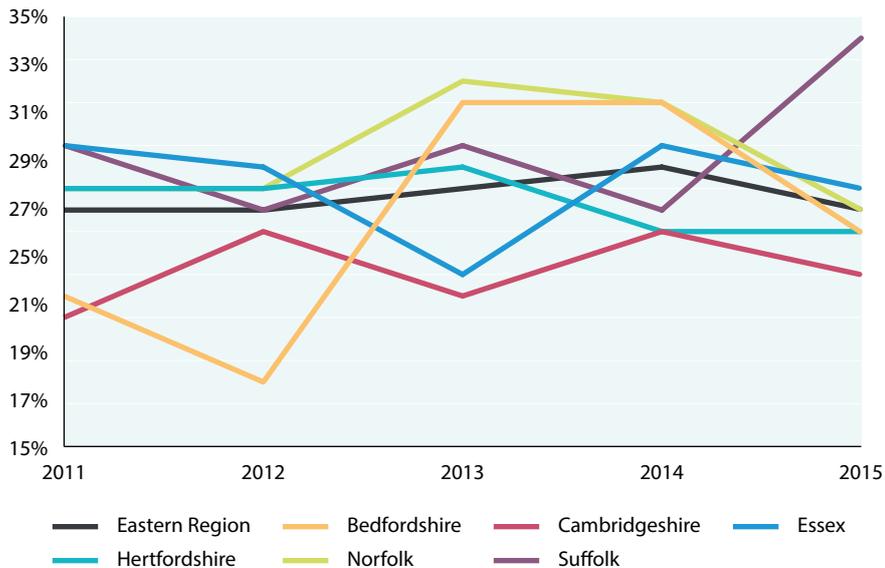
Figure 2: P2W collision involvements per 10k registered bikes



This measure shows much less variation between different areas, indicating the number of P2Ws involved in KSI collisions in a given area⁵ is fairly dependent on the number of bikes registered in that area. However, this still shows Bedfordshire and Essex as having above average rates of P2W KSI collision involvement.

The chart below shows the proportion of all KSI collisions which involve a P2W rider usually varies between 23% and 29%. In contrast, P2W riders account for around 0.6% of private motorised traffic by miles travelled⁶. This means that P2W riders are considerably over-represented in KSI collisions. This graph also shows the proportion of KSI involving a P2W increased sharply in Suffolk in 2015.

Figure 3: Percentage of all KSI collisions involving a P2W



⁵ Applicable to areas the size of any of the Eastern Region Police forces, may not be applicable to smaller areas.

⁶ National Travel Survey, table NTS0305, 2014.

Key Findings:

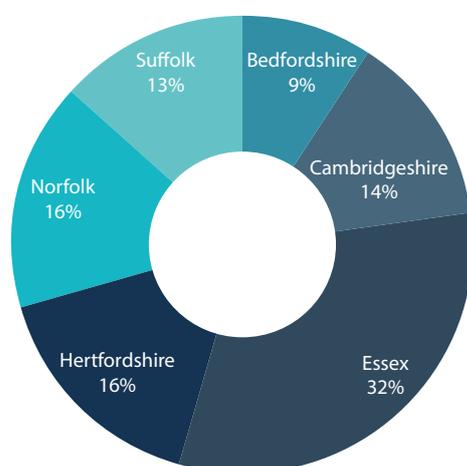
Across the Eastern Region there are around 1.5-2.0 P2W riders involved in a KSI collision per million vehicle miles. The number of P2Ws involved in KSI collisions in a given area is fairly dependent on the number of bikes registered in that area.

Bedfordshire and Essex have above average rates of P2W KSI collision involvement.

P2W riders are consistently over-represented in KSI collisions as they only account for around 0.6% of vehicle miles but 23-29% of KSI casualties.

The chart below shows the proportion of P2W riders involved in KSI collisions in the Eastern Region, by the Police force in which the collision took place.

Figure 4: Proportion of P2W KSI collision involvements by Eastern Region Police force area



This shows nearly a third of P2W riders involved in KSI collisions had their accident in Essex. The next busiest areas (Norfolk and Hertfordshire) each have only half the number of rider KSI involvements as Essex.

Despite its higher rate of involvements per vehicle mile and slightly higher rate per registered bike, the total number of rider involvements in Bedfordshire is relatively small, due to it having the smallest population in the region – see table below. Essex combines a relatively high rate of P2W KSI involvement with the largest population in the region.

Table 1: Eastern Region populations and P2W KSI involvements

Police Area	Population (2015 mid-year estimate)	P2W riders in KSI collisions 2011-15	Involvements per 100k population
Bedfordshire	654,984	275	0.42
Cambridgeshire	841,218	405	0.48
Essex	1,787,037	952	0.53
Hertfordshire	1,166,339	475	0.41
Norfolk	884,978	486	0.55
Suffolk	741,895	390	0.53

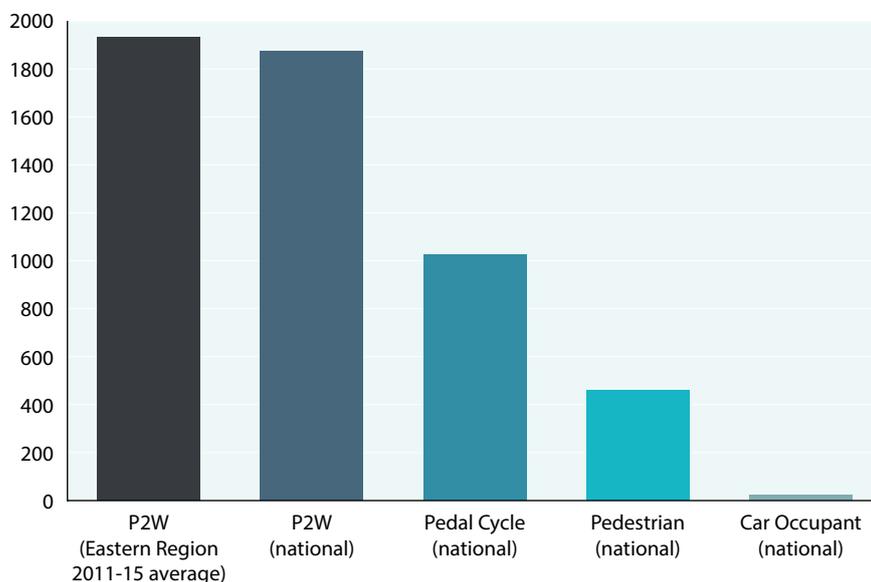
Key Findings:

Norfolk, Suffolk and Essex have the highest rates of P2W riders involved in KSI per 100k local population. Essex accounts for 32% of P2W KSI in the region and 29% of the population.

National comparison

National data for the relative risk of different modes of transport for 2015⁷ in the graph below shows P2W riders to be at considerably higher risk than users of other modes of transport. The risk in the Eastern Region is slightly higher than the average P2W risk nationally.

Figure 5: KSI per billion vehicle miles by transport mode



The document “Motorcyclists involved in collisions on the Strategic Road Network”⁸ examines reported injury collisions involving motorcycles on Highways England’s Strategic Road Network (SRN), nationally, between 2010 and 2014 (with some 2015 data). It provides detailed analysis of P2W issues on the types of road referred to here as “trunk roads”. As such most of the results are not directly comparable with the findings of this document, so the two should be read in conjunction as complementary pieces of work. However, the following findings are worthy of note:

- Severity ratio is very similar in both documents; East of England trunk roads: 38%. National SRN: 37%.
- Peak time analysis shows similar patterns with peaks around weekday commuting times and afternoons at the weekends.
- The SRN document shows an October peak for smaller bikes and summer peak for larger bikes. This is similar, albeit not identical to the seasonal trends described in this document which show a September peak for younger riders (who tend to be on smaller bikes) and a summer peak for older riders (who tend to be on larger bikes).

⁷ <https://www.gov.uk/government/publications/reported-road-casualties-great-britain-annual-report-2015>

⁸ Author: Tanya Fosdick, Road Safety Analysis Limited.

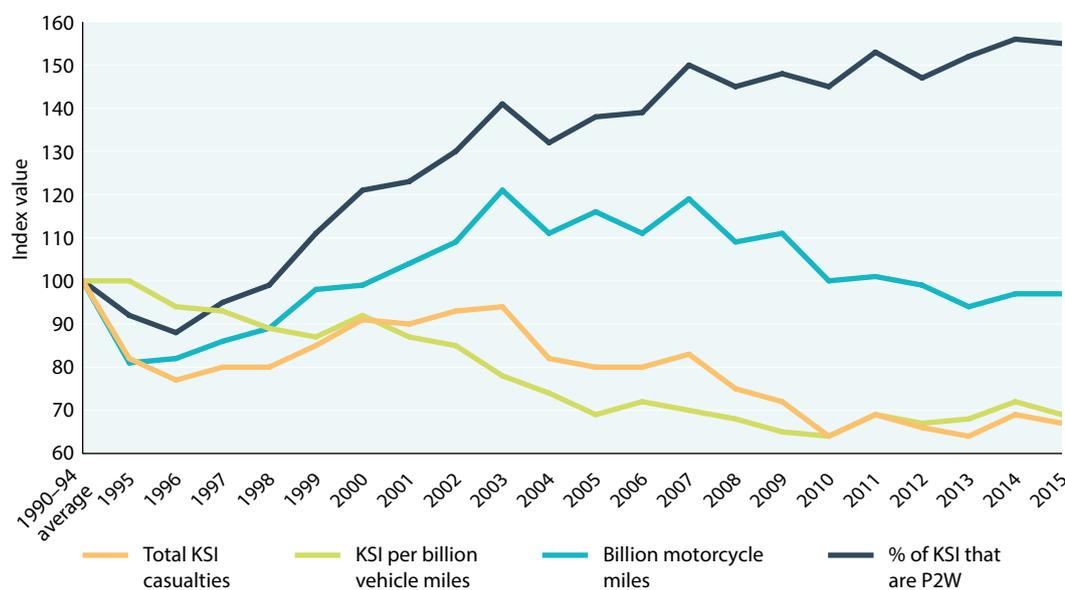
- The SRN document identifies 5 main types of rider, compared to the 3 identified in this document⁹. The 5 rider types in the SRN document have clear equivalents in the 3 types identified here.

SRN Document	This Document
Middle aged male, modest income, commuting on a small bike.	Commuter
Middle aged male, higher income, riding a more powerful bike for leisure at the weekend.	Leisure rider
Young male living with his partner on a very low income, using a bike with a small engine for commuting.	Young Rider
Young male student living with parents using a bike with a small engine to get to school, part time work and to meet friends.	
Young male, very similar to #3 but on a slightly higher income and with a higher level of education.	

Long term trends

Data from the DfT below shows long term national trends in P2W rider casualties. This shows a long term reduction in P2W KSI casualties at a time when miles travelled by P2W have fluctuated but returned to values close to the 1990-94 average, in recent years. This data also indicates that KSI reductions enjoyed by other road users have been greater than those recorded for P2W riders, as the proportion of all KSI that involve a P2W has increased by 50%.

Figure 6: Long term national P2W trends



Financial cost

The DfT document “Transport Analysis Guidance” (TAG) provides a breakdown of the costs associated with road traffic collisions. Each cost element is defined as follows:

⁹ Commuter, Leisure Rider, and Young Rider

- **Lost output** – Days of lost productivity by workers due to injury and death. Calculated on a *per casualty* basis.
- **Human costs** – Includes ongoing health and social care costs but most of this is made up of the intangible, non-cashable value of “costs people would be willing to incur to prevent the casualty”. Calculated on a *per casualty* basis.
- **Medical and ambulance** – Immediate emergency response and treatment in hospital. Does not include ongoing social care costs resulting from life-changing injuries, or other rehabilitation costs. Calculated on a *per casualty* basis.
- **Police cost** – The cost of emergency response and scene management, as well as subsequent collision investigation costs. Calculated on a *per collision* basis.
- **Damage to property** – Cost of replacing or repairing property damaged in the collision. Calculated on a *per collision* basis.
- **Insurance and admin** – Additional costs of insurance not included under property damage. Calculated on a *per collision* basis.

The document *Evaluating the costs of incidents from the public sector perspective, IAM Roadsmart – August 2016*¹⁰ provides a figure for the ongoing health and social care costs per casualty by severity. This figure combines the tangible cashable component of Human Costs, with the Medical & Ambulance costs, it is shown as the item “Total Health & Social Care” in the table below. Using this figure allows us to estimate to total financial burden on the public purse from collisions involving P2Ws. A full breakdown of costs is shown in the appendix, with annual averages summarised below:

Table 2: Summary of costs resulting from P2W collisions

	Fatal	Serious	Slight	KSI	Period total	Annual average
Lost Output	£26,925,336	£15,475,370	£4,545,188	£42,400,706	£46,945,894	£46,945,894
Total human costs	£52,918,185	£105,442,709	£21,657,286	£158,360,894	£180,018,180	£180,018,180
Intangible human costs	£52,613,801	£57,571,237	£9,338,556	£110,185,037	£119,523,593	£119,523,593
Medical & Ambulance	£239,227	£9,288,412	£1,928,124	£9,527,639	£11,455,763	£11,455,763
Social care	£65,158	£38,583,060	£10,390,607	£38,648,218	£49,038,824	£49,038,824
Ongoing Health & Social Care	£304,384	£47,871,472	£12,318,730	£48,175,857	£60,494,587	£60,494,587
Police	£789,900	£1,358,048	£825,106	£2,147,948	£2,973,054	£2,973,054
Damage to Property	£485,121	£3,241,161	£4,508,882	£3,726,282	£8,235,164	£8,235,164
Insurance & Admin	£13,257	£120,814	£172,776	£134,071	£306,847	£306,847
Total cost to society	£81,371,026	£134,926,514	£33,637,361	£216,297,540	£249,934,901	£249,934,901
Total financial cost	£28,757,225	£77,355,278	£24,298,805	£106,112,503	£130,411,308	£130,411,308
Total public sector	£1,333,511	£58,517,932	£15,071,960	£59,851,444	£74,923,403	£74,923,403

¹⁰ From <https://www.iamroadsmart.com/docs/default-source/research-reports/evaluating-the-costs-of-incidents-from-the-public-sector-perspective.pdf?sfvrsn=0> Accessed 6th January 2017.

The total cost to society is the sum of all exclusive¹¹ cost items in each column, the total financial cost excludes the intangible human costs, and the public sector cost is the sum of Police, Health and Social Care costs.

Key Findings:

P2W riders are at considerably higher risk of being killed or seriously injured than users of other modes of transport. This risk has reduced since the early 1990s, but by a smaller factor than the risk for other road users.

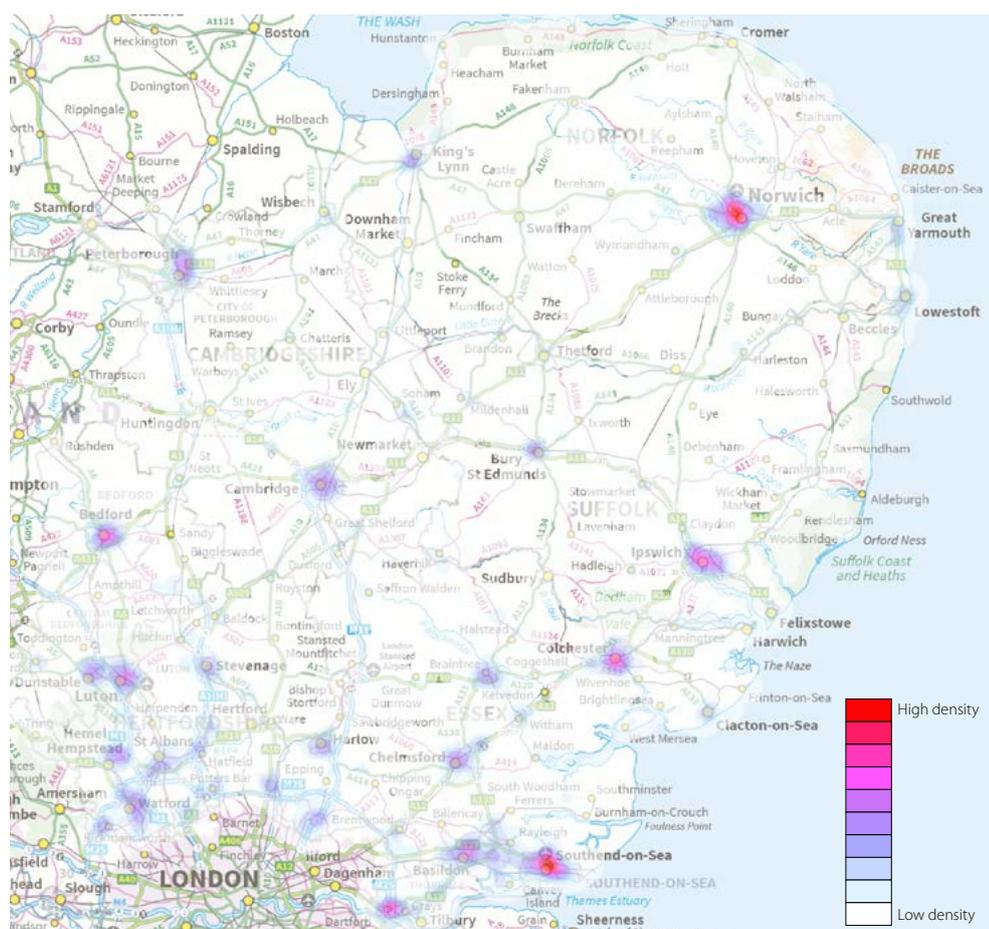
Injuries to P2W riders on the roads in the Eastern Region cost the public sector £75 million per year.

Geographic analysis

KSI Collision Locations

Hotspot areas

Figure 7: Hotspot map for KSI collisions involving a P2W



¹¹ Includes Total Human costs and Medical & Ambulance costs, excludes Social Care (part of Total Human costs) Total Health & Social Care (this is the sum of Medical & Ambulance and Social Care) and Intangible Human costs (part of Total Human costs).

The map above shows most KSI collision hotspots to be located in larger urban areas, particularly Norwich, Southend, Ipswich, Bedford and Colchester. There are a number of smaller hotspots and these are concentrated in the southern part of the region. There is also a concentration in the vicinity of the Dartford River Crossing, which includes the A282, M25, A13 and roads around the Lakeside shopping centre.

These are the areas where any localised initiatives aimed at drivers and riders on the road should be concentrated.

Road types

The table below gives a breakdown of the proportion of P2Ws involved in a KSI collision, by the type of road where the collision took place, for each Police Force area in the Eastern Region. These road types are defined as:

- **Urban:** All roads up to and including 40mph speed limit.
- **Rural:** Roads with a 50-60mph speed limit, excluding dual carriageways and slip roads.
- Dual carriageways and slip roads with a 50-60mph speed limit, and all roads with a 70mph speed limit.

Table 3: *Percent of P2Ws involved in KSI collisions by road type for each force area*

Area	Urban	Rural	Trunk
Bedfordshire	60%	33%	7%
Cambridgeshire	44%	40%	16%
Essex	60%	27%	13%
Hertfordshire	60%	23%	17%
Norfolk	54%	43%	3%
Suffolk	56%	39%	5%
Eastern Region	56%	33%	11%

This shows there is some variation between areas, which may reflect the differing highway network across the region. The following table shows the number of P2W KSI involvements per 100km of carriageway, broken down by urban, rural and trunk roads.

Key Findings:

KSI collision hotspots tend to be located in larger urban areas, particularly Norwich, Southend, Ipswich, Bedford and Colchester, with over half of all KSI collisions being on urban roads. 56% of P2W KSI are on urban roads and 33% on rural roads.

Table 4: P2W KSI collision involvements per 100km of carriageway

Area	Urban	Rural	Trunk	All roads
Bedfordshire	14	6	19	10
Cambridgeshire	13	4	26	7
Essex	15	5	50	10
Hertfordshire	11	5	68	10
Norfolk	20	2	9	5
Suffolk	16	3	16	6
Eastern Region	14	4	32	7

The table above shows the greatest concentration for collisions by mile of carriageway is on trunk roads. However in the Eastern Region there is a traffic density¹² of 19.4 million vehicle miles per mile of carriageway for trunk roads, compared to 0.8 for rural roads and 1.3 for rural roads. Traffic density may therefore explain much of the difference between urban, rural and trunk road collision involvement rates.

Figure 10 shows the majority of collisions in all Police Force Areas except Cambridgeshire are on urban roads. Most of the variation between Police Forces is in the proportion of KSI on rural and trunk roads. This data suggests advice for different types of riding should be focussed as follows:

- Urban riding – Bedfordshire, Essex, Hertfordshire, Norfolk, Suffolk
- Rural riding – Cambridgeshire, Norfolk, Suffolk
- Trunk road riding – Cambridgeshire, Essex, Hertfordshire

Severity factor is a measure of the proportion of all recorded injury collisions that resulted in serious or fatal injuries. Comparing severity factor for the three main road types shows:

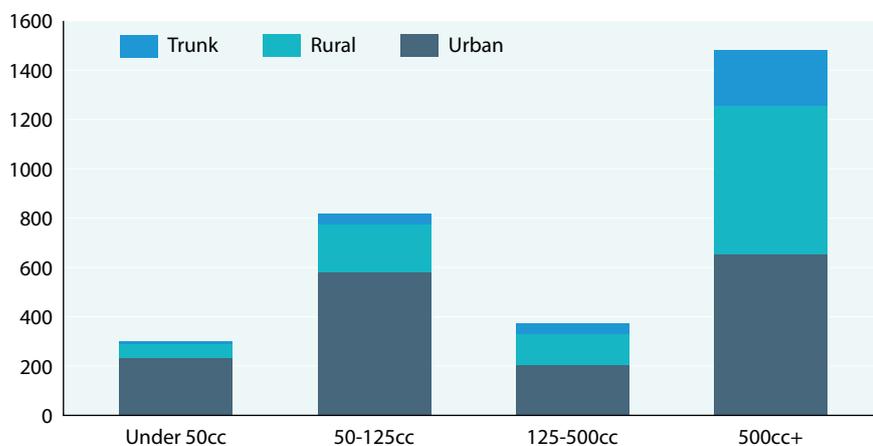
- Urban road P2W severity factor 26%
- Rural road P2W severity factor 43%
- Trunk road P2W severity factor 38%

Therefore collisions on rural roads are the ones most likely to result in a KSI. This is likely to be related to vehicle speed and traffic segregation; urban roads tend to have the lowest speeds hence the lowest severity factor (least likely that any given casualty is a KSI), trunk roads tend to have the highest speeds but have segregation of traffic flows, rural roads combine higher vehicle speeds with a lack of “Safer Systems” features, resulting in the highest severity factor.

The following table gives a breakdown of total KSI collision involvement for the 5 year period by P2W engine size and road type.

¹² Calculated using national statistics tables TRA01 and RDL02

Figure 8: P2W KSI involvement by engine size and road type



Despite comprising only 38% of bikes in all KSI collisions, P2Ws with engines up to 125cc account for 49% of urban KSI. While half of all bikes involved in a KSI have 500cc+ engines, these are under-represented in urban road collisions (39% of urban KSI), but over-represented in rural-road collisions (62% of rural KSI) and trunk road collisions (70% of trunk road KSI).

Key Findings:

Collisions are more likely to occur on roads with higher traffic densities. However, higher vehicle speeds and absence of traffic segregation means that collisions on rural roads are the ones most likely to result in a KSI.

Bikes with engines up to 125cc are over-represented on urban roads, while bikes with 500cc+ engines are over-represented on rural and trunk roads.

Routes

The following table shows the classified roads with the highest number of P2W KSI collisions during the 5 year period. In order to avoid double counting with the urban hotspots identified previously, this routes analysis only includes roads with speed limits of 50mph or above. Between them, these 22 routes account for 16% of all P2W KSI collisions in the region.

Table 5: Non-urban routes with most P2W KSI collisions

Route	% of total P2W KSI	Route	% of total P2W KSI	Route	% of total P2W KSI
A47	1.7%	A143	0.8%	A131	0.5%
A12	1.3%	A142	0.7%	M1	0.5%
A414	1.1%	A149	0.7%	A13	0.4%
A10	1.0%	A505	0.7%	A41	0.4%
A1	0.9%	A507	0.6%	A428	0.4%
A14	0.9%	A120	0.5%	A5	0.4%
M25	0.8%	A140	0.5%		
A127	0.8%	M11	0.5%		

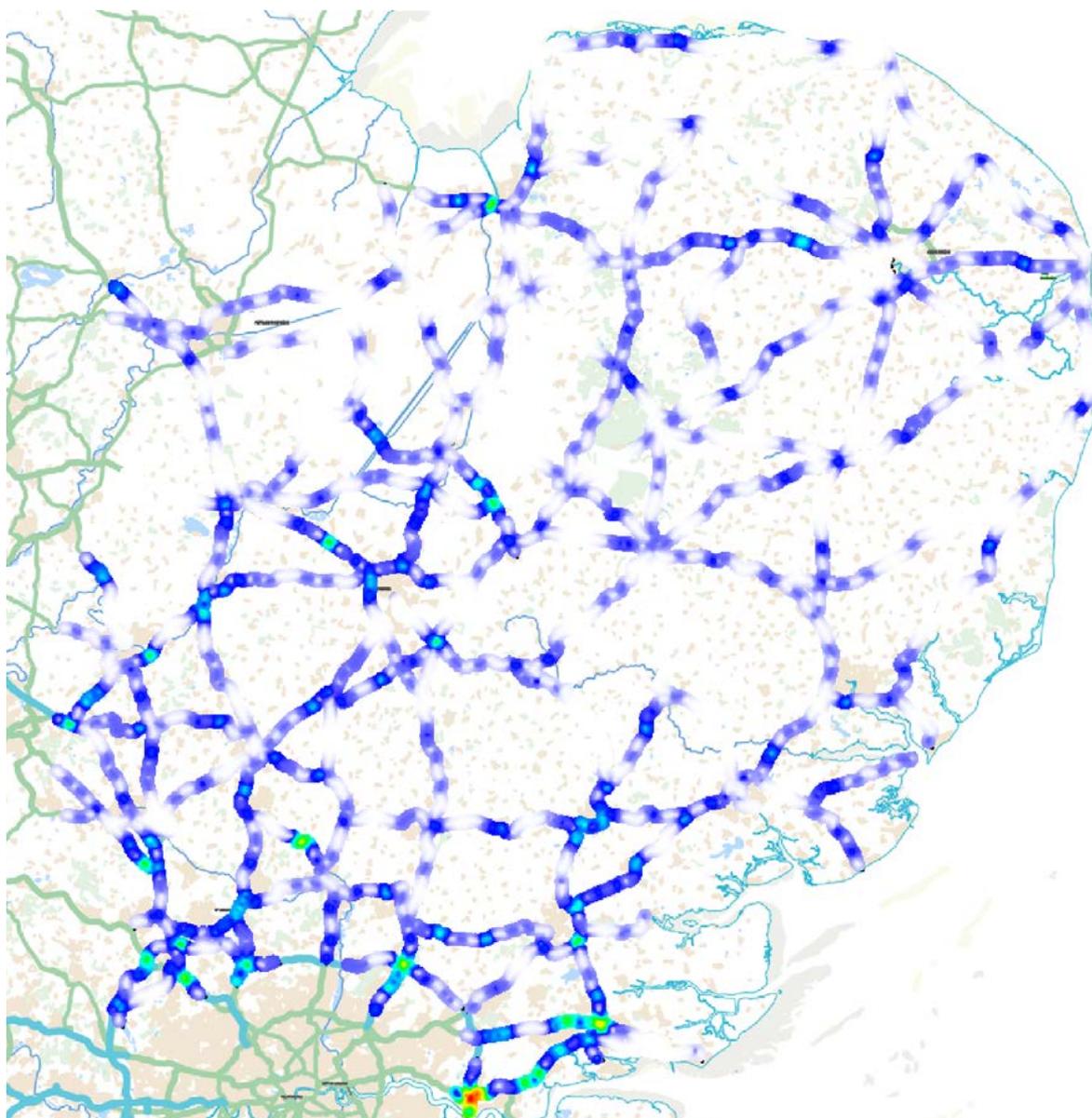
Table 5 shows which routes had the greatest number of P2W collisions on them, regardless of route length. Therefore some high risk routes may not appear on this list if they are short roads.

The following map shows collision frequency along these routes, highlighting the sections which see a relatively high frequency of P2W collisions. This map also includes a number of major roads not included in the table on the left, which are relatively short in length so would not feature in the table due to having a low total number of collisions despite a potentially high frequency of collisions per mile of carriageway. A full list of these roads can be found in the appendix.

Key Findings:

Around 16% of the collisions in the region take place on a group of 22 classified major roads, outside of urban areas.

Figure 9: P2W Route analysis



The route analysis shows the stretches of road with the greatest collision frequency include the following:

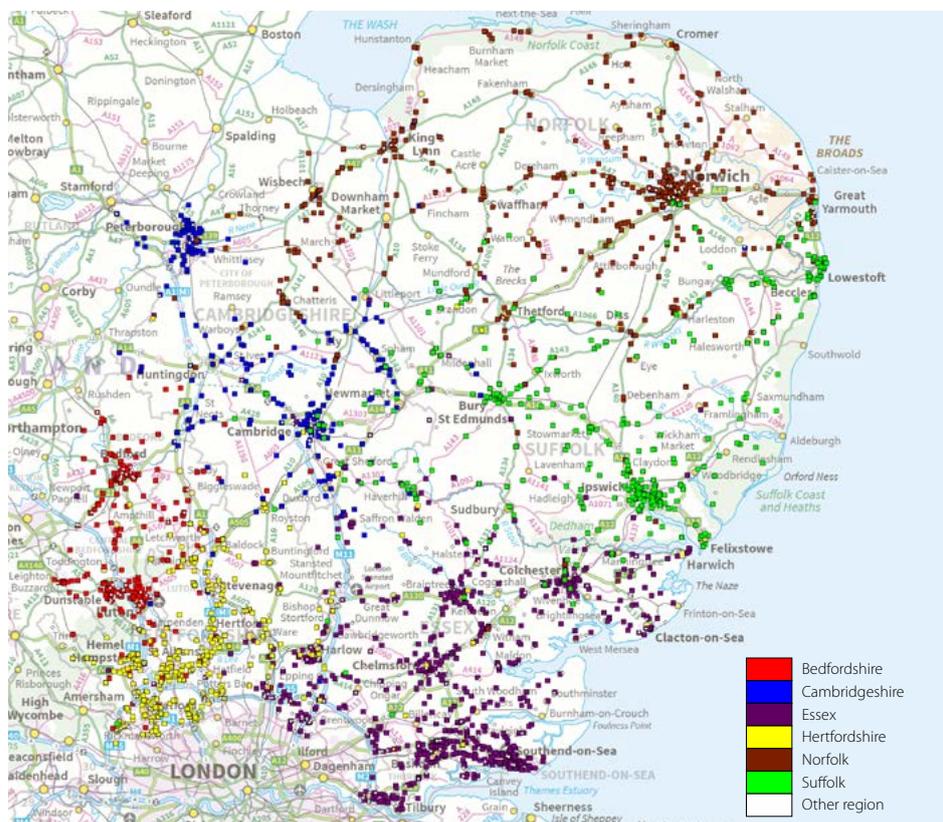
- A17 / A47 junction west of Kings Lynn and A149 north of Kings Lynn
- A47 west of Norwich
- A142 south of Mildenhall
- A14 north-west of Cambridge
- A11 junction with A505
- A5 south of Dunstable
- A1 Hatfield
- A127 west of M25
- A127 Basildon
- A13 and M25 DRC approach
- A13 Stanford-le-Hope
- A120 Braintree

Close-up images of these areas can be found in the appendix.

Rider home address

The map below shows collision locations colour coded by the Police Force area where the rider’s home address is located. For example a green square in Norfolk shows a Norfolk collision involving a Suffolk-based rider. ***This indicates where riders involved in specific collisions come from.***

Figure 10: Collision location by home Police Force for P2W riders involved in KSI collisions in the Eastern Region



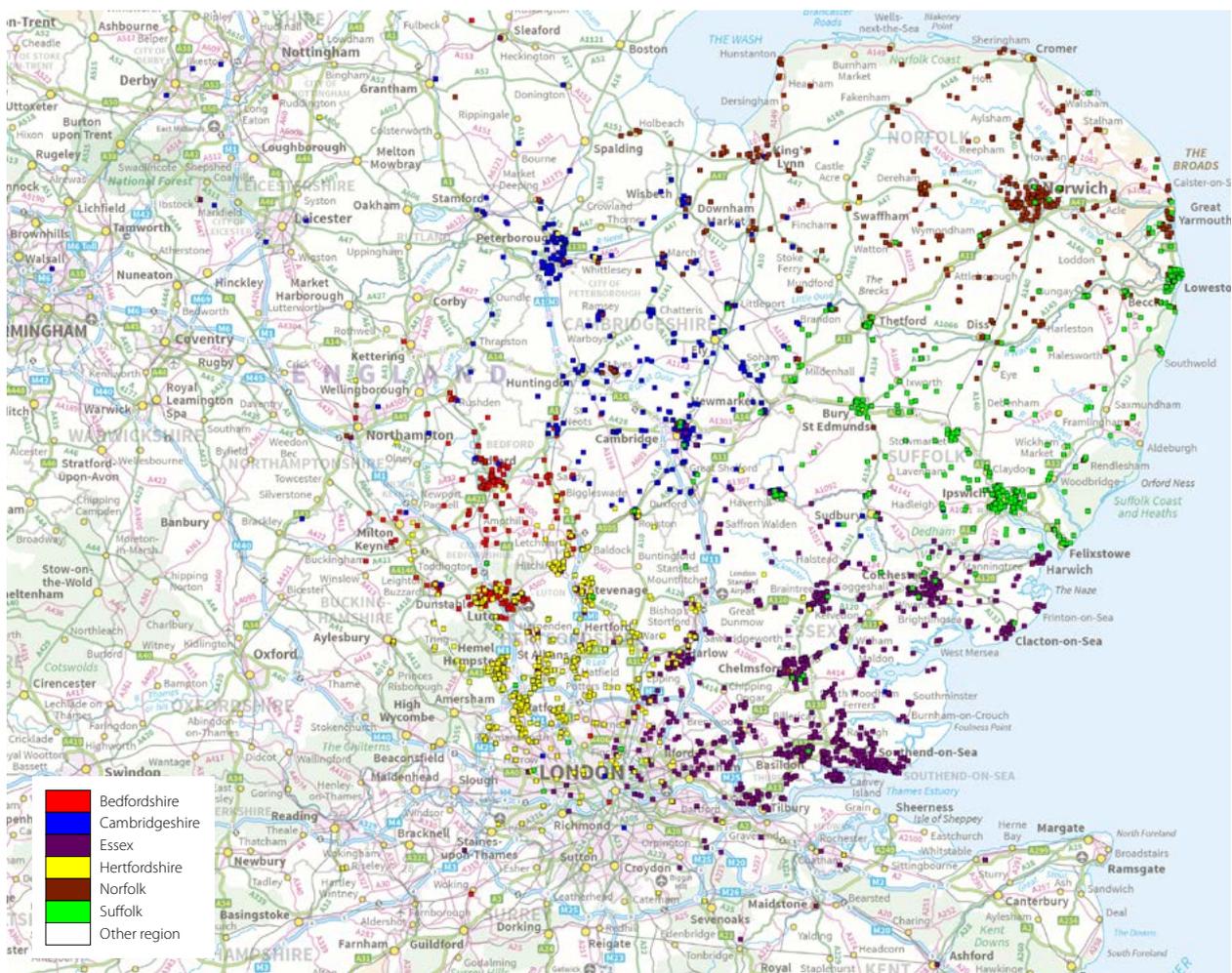
This shows most collisions involve riders from the same Police Force area as where the collision took place. Most cross border activity is close to the borders indicating there is not much impact on local figures from long distance riders.

Essex, Hertfordshire and Bedfordshire see most riders from outside the region, this is likely because these areas include most of the region’s border area.

There is a fair degree of overlap involving Suffolk, with many riders from Suffolk having collisions in Norfolk, Cambridgeshire and Essex, while a number of riders from Norfolk and Essex have collisions in Suffolk. North-East Cambridgeshire sees a majority of its involved riders coming from Norfolk and there is a lot of movement from Bedfordshire into North Hertfordshire.

The map below reverses the key of the previous map, showing approximate home address locations for P2W riders involved in KSI collisions in the Eastern Region, colour-coded by the police force area where they had their collision. In other words the location of the square shows where the rider lives, and colour indicates the Police Force area where they had their collision. For example a green square in Norfolk shows a Norfolk-based rider had a collision somewhere in Suffolk. ***This indicates where riders in specific areas go to for their collision.***

Figure 11: Home address locations for P2W riders involved in KSI collisions in the Eastern Region



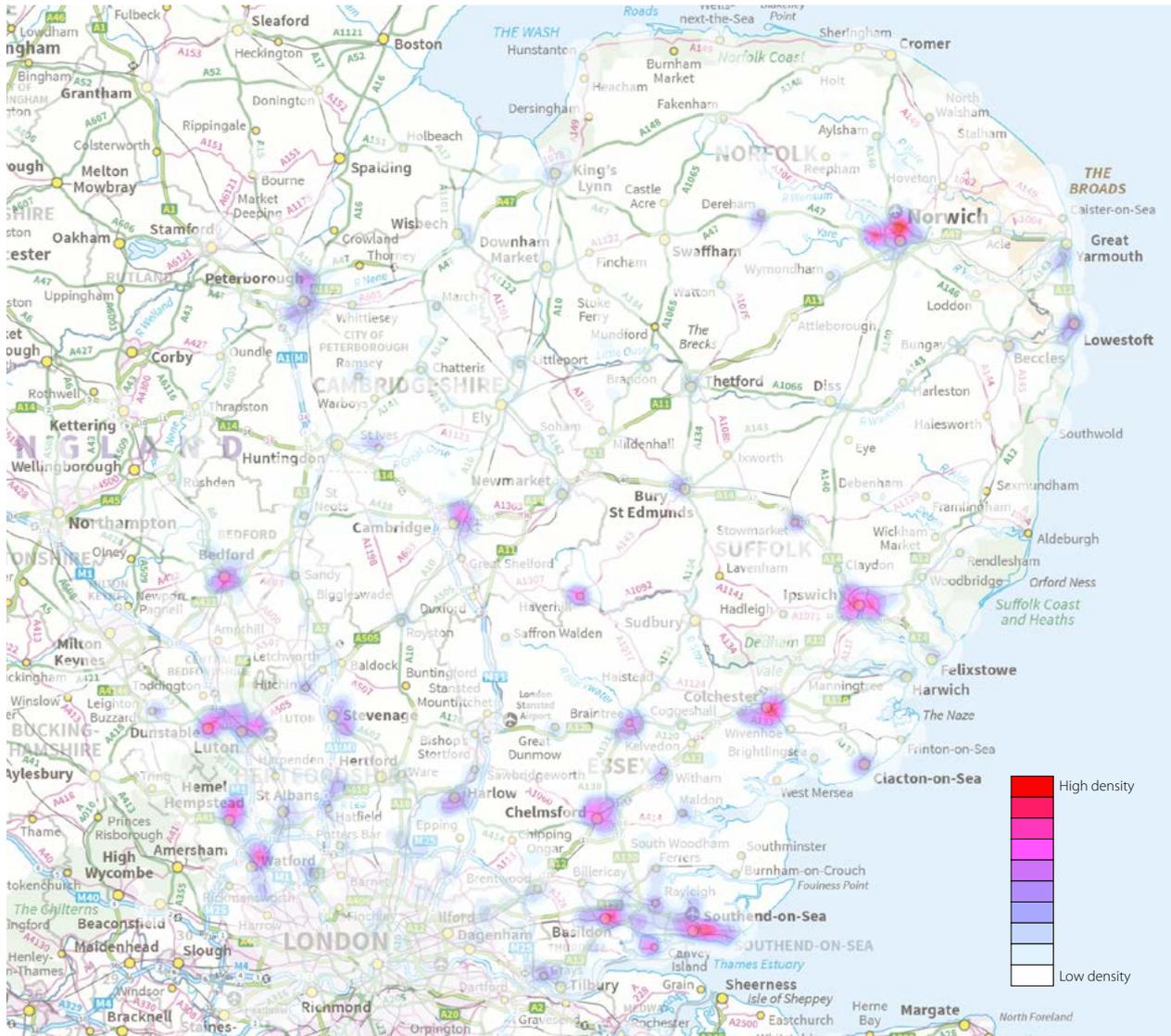
This shows the vast majority of riders come from within the region and parts of London north of the River Thames. Most riders from outside of the region are from East London (collisions in Essex), North

London (Hertfordshire) and Northamptonshire (Bedfordshire).

The map also shows most riders have their collision in their home force, with the majority of 'cross-border' riders living near the border and having their collision in a *neighbouring* force area. A very small number of riders travel across the region or from other regions to have their collision.

The following map shows where the hotspot locations for rider home-addresses are.

Figure 12: Hotspot map for home address of P2W riders involved in KSI collisions



The map above shows the pattern of rider-home-address hotspots are more dispersed than the pattern for collision location. Hotspots are still concentrated in urban areas, but places like Luton, Hemel Hempstead, Watford, Chelmsford, Basildon and Cambridge are more prominent than they are on the collision location map.

This suggests riders who live in Luton, Hemel Hempstead, Watford, Chelmsford, Basildon and Cambridge are more likely to have collisions in areas away from the town where they live.

All the hotspot areas shown above are the areas where a campaign aimed at local resident P2W riders should be focused.

Key Findings:

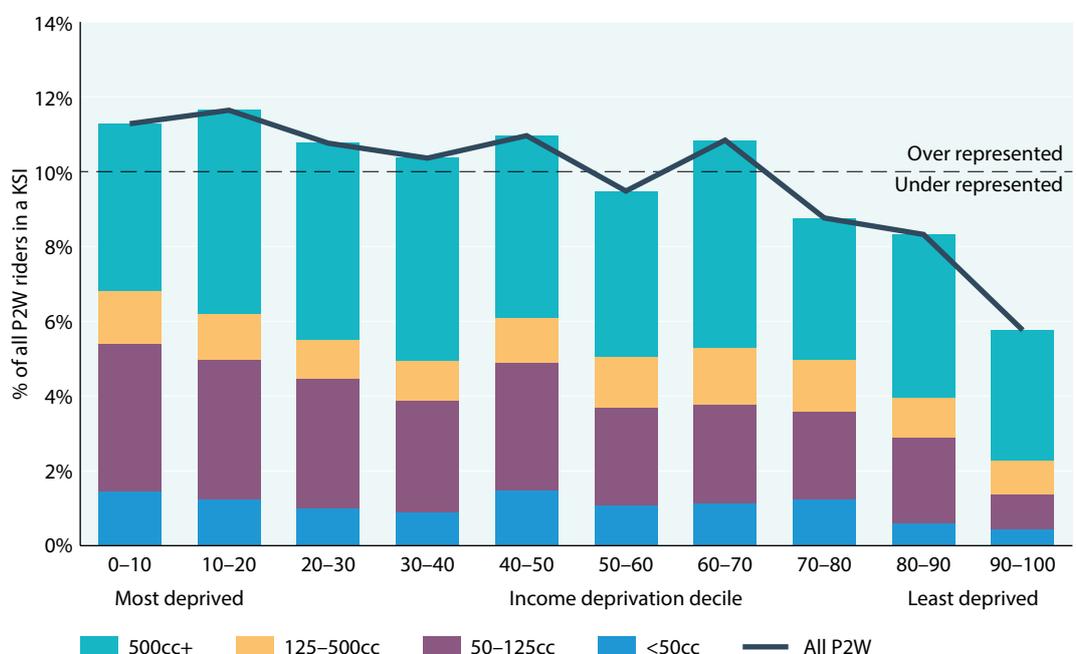
Most cross border activity is close to the borders indicating there is not much impact on local figures from long distance riders. Furthermore most riders have their collision in their home Police Force area, with the majority of ‘cross-border’ riders living near the border and having their collision in a neighbouring force area.

There is a more dispersed pattern of rider home hotspots compared to collision location hotspots, but they are still most concentrated in urban areas.s.

Rider neighbourhood types

The graph below shows the proportion of P2W riders involved in a KSI by *Income* deprivation decile¹³ of their home address. The data used includes just those riders who live in the Eastern Region.

Figure 13: Deprivation decile of P2W riders by motorcycle engine size



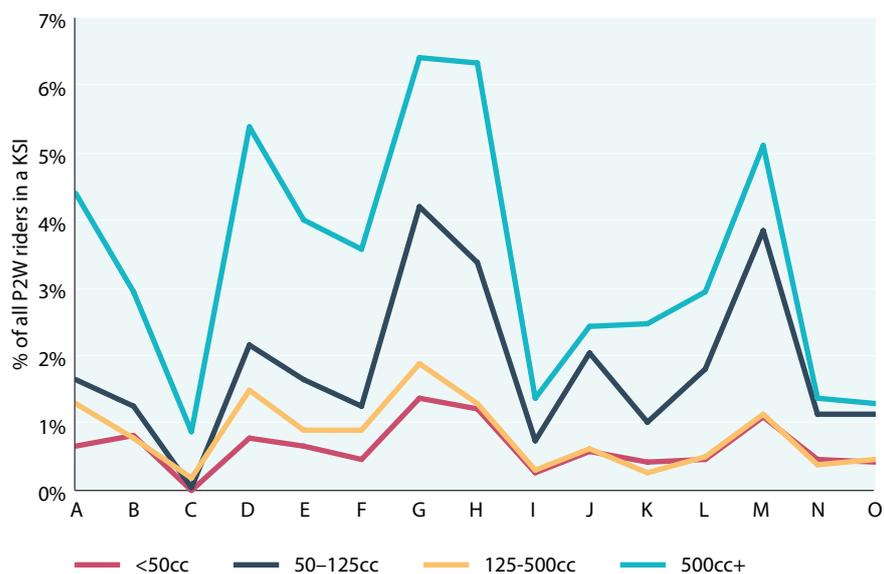
The general population of the Eastern Region is evenly distributed across the deprivation deciles (i.e. not normally distributed, so there are the same number of people in each decile). This indicates P2W riders involved in a KSI are slightly more likely to come from areas with average to lower levels of income. Although it is only at the very highest levels of income that P2W rider involvement in a KSI becomes notably less likely. This data suggests engagement designed for people with average to lower incomes would be most likely to find the target audience.

The next graph shows the same data split by Mosaic¹⁴ grouping.

¹³ IMD – Indices of Multiple Deprivation. This is a measure of how deprived or affluent an area is. Areas are sorted in order of deprivation and divided into 10 equal deciles, with 0-10 being the most deprived and 90-100 being the most affluent. These deciles are for the population of the Eastern Region.

¹⁴ Mosaic is a socio-economic tool for categorising the predominant types of household in a residential postcode area.

Figure 14: Mosaic grouping of P2W riders by motorcycle engine size



For the most common type of motorcycle (500cc+) the most common Mosaic types are:

- A: Well-off owners in rural locations enjoying the benefits of country life
- D: Thriving families who are busy bringing up children and following careers
- G: Householders living in inexpensive homes in village communities
- H: Younger households settling down in housing priced within their means
- M: Families with limited resources who have to budget to make ends meet

This shows riders of 500cc+ bikes are from a range of areas, from well-off rural communities to areas where people live on tight budgets.

For the second most common type of motorcycle (50-125cc) the most common Mosaic types are:

- D: Thriving families who are busy bringing up children and following careers
- G: Householders living in inexpensive homes in village communities
- H: Younger households settling down in housing priced within their means
- J: Educated young people privately renting in urban neighbourhoods
- M: Families with limited resources who have to budget to make ends meet

This shows riders of 50-125cc bikes also come from a range of areas, although these tend to be less affluent than the places where 500cc+ riders live.

Communications strategies for these Mosaic groups can be found in the appendix.

Key Findings:

P2W riders involved in a KSI are slightly more likely to come from areas with average to lower levels of income, although it is only at the very highest levels of income that P2W rider involvement in a KSI becomes notably less likely. Riders of 500cc+ bikes are from a range of areas, from well-off rural communities to areas where people live on tight budgets. Riders of small bikes up to 125cc also come from a range of areas, although these tend to be less affluent than the places where 500cc+ riders live.

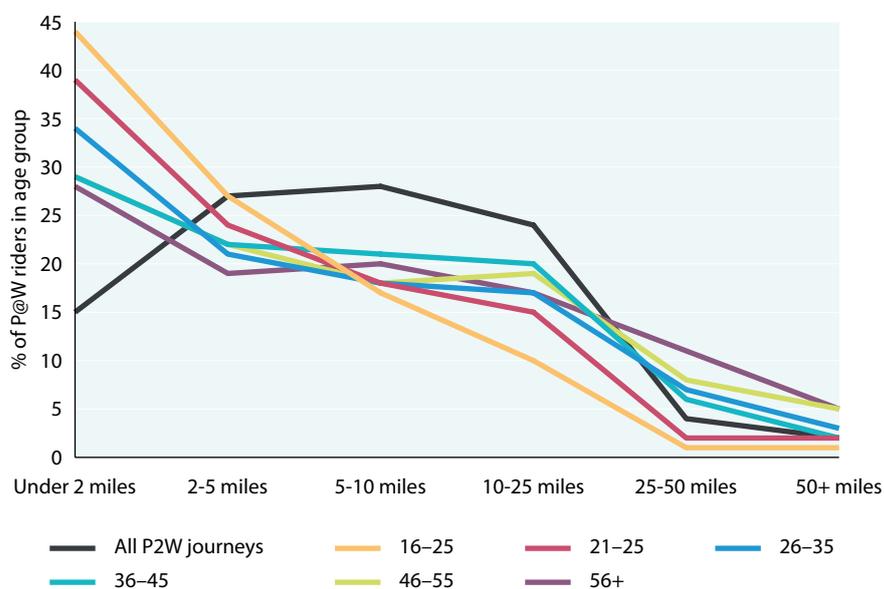
The over-representation of riders in lower income areas reflects a wider trend in deprivation being a predictor of collision risk for all road users. Although not possible to test using STATS19 data, it is possible deprivation may be linked to specific risk factors such as level of bike ownership, behavioural trends, bike maintenance and quality and usage of protective equipment.

Distance from home

Rider distance

The distance “as the crow flies” from the rider’s home address¹⁵ to the location of their KSI collision can be calculated for the majority of cases where an accurate postcode has been recorded. The following chart summarises this information and compares it to trip distance range distribution data for motorcycles from the national travel survey (“All P2W journeys” field):

Figure 15: Distance from home to collision by rider age group



This graph and the data it is based on, illustrates the following:

- Across all age groups, 59% of riders involved in a KSI have their collision less than 5 miles from home, this is compared to 42% of all P2W journeys being in this mileage range.
- A further 36% of riders involved in a KSI have their collision between 5 and 25 miles from home, this is compared to 52% of all P2W journeys being in this mileage range.
- All age groups see a decrease in collision numbers with increased distance from home. However there is a clear trend of larger proportions of riders having collisions at greater distances from home as rider age increases. For example Younger riders, aged 16-25 are the biggest group in the under 5 miles range, while riders aged 56+ are the biggest group in the 25+ miles range. The order of age groups converges between the 5 and 10 miles range, before reversing in order.
- Comparison with national travel survey trip distance data indicates the under 2 miles range is the most risky.

¹⁵ Using the grid reference of their postcode centroid. It is not possible to determine actual distance ridden.

The average distance from home to collision location for each age group is as follows:

Table 5: Average distance from home to KSI collision location

	Age Group	16 - 20	21 - 25	26 - 35	36 - 45	46 - 55	56 - 65	66 - 75
Average distance (miles) from home to collision location	P2W Riders	3.7	7.7	10.6	9.7	12.3	14.9	9.3
	Car Occupants	7.7	11.8	12.8	11.4	13.0	13.3	11.6

This shows riders aged 56-65 travel the furthest from home to collision locations so are the age group most likely to be involved in non-local collisions. This is reflected in the reversal of order in the age groups in figure 20 between the 5 and 50 miles ranges.

Comparing this with the distances for car occupants, overall there is not a lot of difference in the average distances, with most variation being in the younger age groups. This is manifested in shorter distances for young P2W riders – suggesting they ride more ‘locally’ than young car drivers.

Average distances increase with age up to and including the 56-65 year old group, **therefore any cross-border casualty reduction initiatives directed at P2W riders should focus on those aged 46-65.**

Key Findings:

Although riders of all ages tend to have their collision within 15 miles of home there is a clear trend of older riders travelling further distances between home and collision location. Most young rider collisions are close enough to home to be in the same town as where the rider lives, suggesting these riders are best helped by localised initiatives and cross border initiatives should focus on older riders.

Cross border activity

There is some variation across the region in the percentage of collisions involving ‘local’¹⁶ riders. For each district/unitary two measures have been applied to determine cross border activity:

- Percentage of collisions in district/unitary involving riders who live elsewhere – **“Import rate”**
- Percentage of riders living in district/unitary, involved in a collision elsewhere within the Eastern Region – **“Export rate”**

An area with low import and export rates may be relatively isolated from the rest of the region in terms of P2W activity. If this is combined with a high rate of P2W rider involvements per local population it would indicate the area has a problem with local P2W rider safety. **This type of area may benefit from initiatives targeting local resident P2W riders.** The top areas in this group are as follows¹⁷:

¹⁶ Defined as living in the same local authority district/unitary as their collision

¹⁷ See appendix for full tables of import and export rates by district/unitary.

Table 6: Local authorities with low rider import and export rates

Local Authority Area	Import Rate	Export Rate	KSI involvements per 10k population	
			Selected area	Regional Average
Ipswich	29%	37%	5.11	
North Norfolk	32%	32%	3.69	
Peterborough	29%	13%	4.52	4.96
Southend-on Sea	39%	27%	5.23	
Waveney	19%	27%	4.92	

This highlights Ipswich and Southend-on-Sea as having a particular issue with local P2W riders, both with an import and export rate of less than 40% and an above average rate of involvement per 10k population.

An area with a high import rate and a low export rate, combined with a high rate of P2W rider involvements per local population, is likely to be attracting P2W riders from elsewhere. **This type of area may be more likely to see the benefits of a P2W safety campaign for riders on the road in the area** as well as a wider regional campaign targeting all riders. The following areas were identified as having a combination of an import rate of over 55% and an export rate of under 45%¹⁸:

Table 7: Local authorities with high rider import and low rider export rates

Local Authority Area	Import Rate	Export Rate	KSI involvements per 10k population	
			Selected area	Regional Average
Brentwood	60%	39%	4.63	
Broxbourne	57%	20%	2.92	
Epping Forest	73%	34%	7.77	4.96
Hertsmere	62%	23%	5.08	
Three Rivers	67%	43%	5.42	

This highlights Epping Forest, Hertsmere and Three Rivers as being areas particularly attractive to P2W riders, with import rates of over 60%, low export rates and KSI involvement rates above the regional average.

Key Findings:

Ipswich and Southend-on-Sea appear to have issues with local riders; relatively few local riders have collisions elsewhere and relatively few riders from elsewhere have collisions in these areas. They also have above average rates of P2W KSI involvements per 10k population.

Epping Forest, Hertsmere and Three Rivers also have above average rates of P2W KSI involvements per 10k population and relatively few local riders being involved in KSI elsewhere, but in contrast they see relatively large numbers of riders from other areas. This suggests these areas are an attractive destination for many P2W riders.

¹⁸ See appendix for full list of P2W rider KSI involvements per 10k population by local authority area.

Peak time analysis

Peak times by Police Force area

The table below summarises the peak times for all P2W KSI collisions:

Table 8: Peak time summary for P2W KSI collisions by Police Force area

	Peak times	Peak Days	Peak periods
Bedfordshire	1700-1900	Monday Wednesday Thursday	Thursday and Friday 1700-2000
Cambridgeshire	1700-1800 1200-1400	Tuesday Thursday Sunday	Monday, Tuesday and Friday 1700-2000 Weekends 1000-1400
Essex	1600-1800	Tuesday Wednesday Friday	Weekdays 1600-1900 Weekends 1200-1700
Hertfordshire	1600-1900	Friday	Tuesday and Friday 1600-1900 Wednesday, Thursday and Friday 0700-0900
Norfolk	1700-1900	Monday Saturday	Weekdays 1700-1900 Weekends 1200-1700
Suffolk	1400-1800	Saturday Sunday	Monday 1500-1800 Weekends 1200-1700

Although there are differences between each area, peak times across the region are generally during weekday afternoon commuting times, and during the afternoon at weekends.

These peak times suggest a mix of commuting traffic, and social/leisure riding at the weekend.

Key Findings:

There is some variation in peak times for collisions but they are largely around afternoon weekday commuting times, and through the afternoon at weekends.

Peak times in main hotspot areas

The table below summarises peak times for P2W KSI collisions in the collision hotspot areas identified in the Geographic Analysis section.

Table 9: Peak time summary for P2W KSI collisions by main collision hotspot area

	Peak times	Peak Days	Peak periods
Norwich	1600-1800	Monday Tuesday	Thursday and Friday 1600-1800 Tuesday 0900-1200
Ipswich	1600-1900	Friday	Thursday and Friday 1600 - 1900
Bedford	1700-2000	Thursday	none
Colchester	1600-1900	Friday	none
Southend	1600-2000	Wednesday Thursday Friday	Tuesday to Friday 1600 - 2000 Saturday 2000 - 2200
Thurrock / DRC	none	none	none

NOTE: Where the table states there are no peak periods, this means the peak times are spread over most days and/or the peak days have collisions at various times that day.

This data shows the urban hotspots tend to have peak times around the weekday afternoon commute.

Key Findings:

The urban hotspots tend to have peak times around the weekday afternoon/evening commute.

Peak times by road type

The table below shows a summary of peak times by road type.

Table 10: Peak time summary for P2W KSI collisions by road type

	Peak times	Peak Days	Peak periods
Urban	1600-1900	Tuesday Friday	Weekdays 1600-1900 Weekends 1200-1400
Rural	1600-1800	Saturday Sunday	Weekends 1100-1800
Trunk	1500-1900	Friday	Friday 1600-1900

This shows peak times in line with expected road use:

- Urban roads peaking during weekday commuting times
- Rural roads peaking at times when weekend leisure riders would be expected to ride
- Trunk roads peaking on Friday afternoon with people getting away for the weekend on longer trips.

Key Findings:

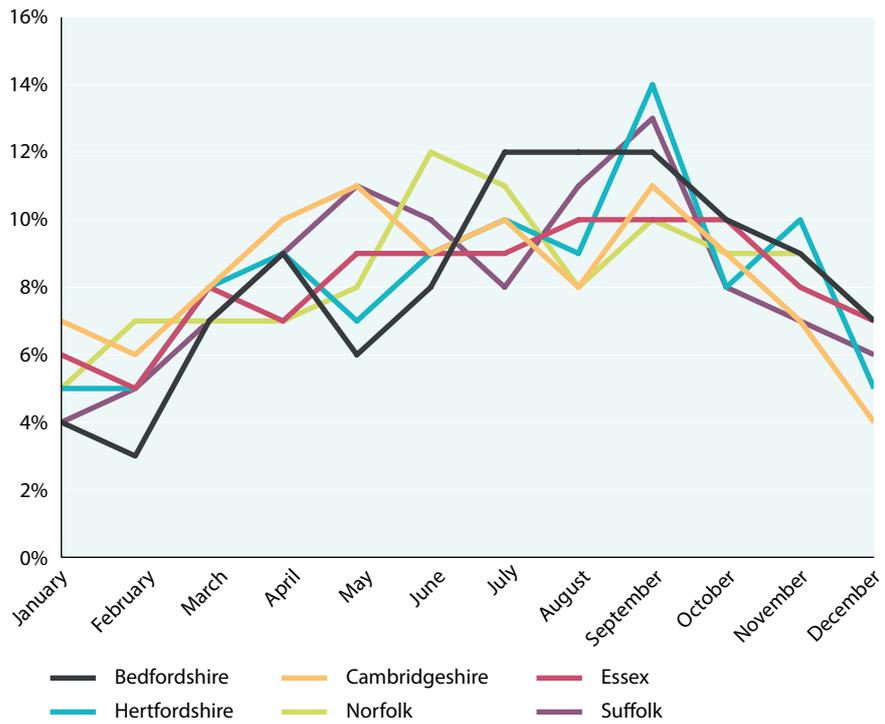
The peak times for each road type are in line with the expected road use; urban roads peaking during weekday afternoon/evening commuting times, rural roads peaking at times when weekend leisure riders would be expected to ride, and trunk roads peaking on Friday afternoon when it is possible some people are getting away for the weekend on longer trips, or riding further because they have more time.

Seasonal trends

This section examines seasonal trends for P2W KSI collisions, comparing Police Force area, road types and rider ages. The graphs in this section show the percentage of the total annual KSI collision involvements for each category, for each month of the year.

Police force area

Figure 16: Seasonal trend by Police Force area



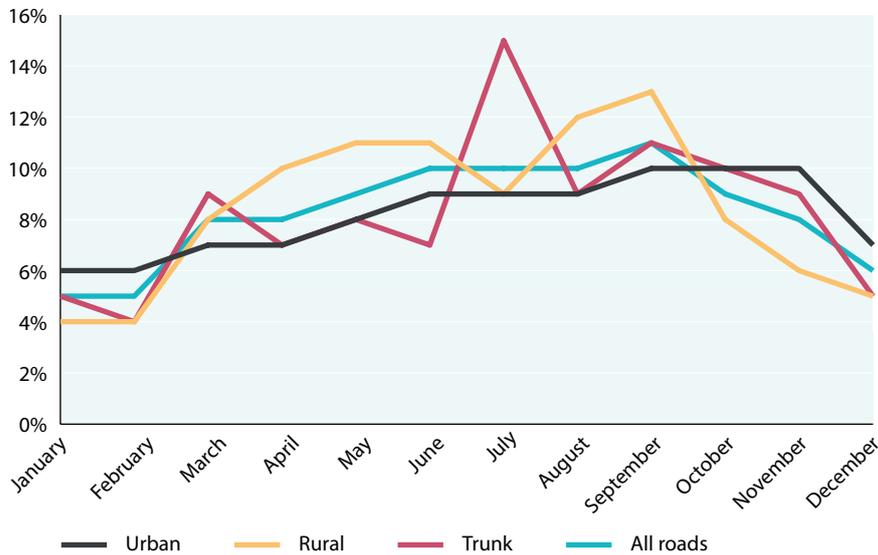
This shows all areas broadly follow the same trend of more P2W KSI collisions during summer months. The effect is particularly noticeable in Bedfordshire for the July-September period, with Suffolk and Hertfordshire seeing notable peaks in September.

This trend is likely to be because of the following factors:

- More miles are ridden on P2Ws during summer months, especially when trips are for leisure purposes. This is consistent with usage survey data shown in the appendix.
- Riders may be more inclined to take risks or ride at higher speed in the good conditions more common during summer months.

Road type

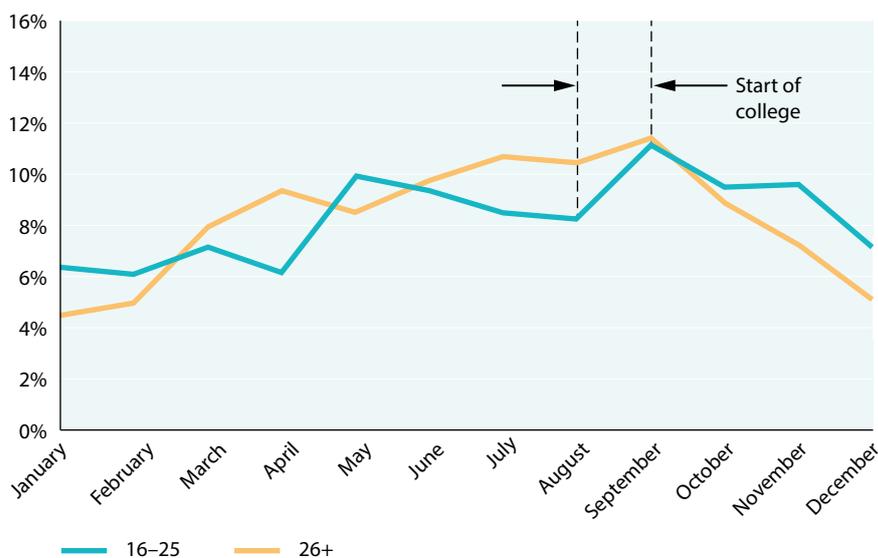
Figure 17: Seasonal trend by road type



This shows the same seasonal trend as before, but is particularly pronounced for rural and trunk roads. This is consistent with collisions on urban roads being more likely to involve year-round commuter traffic, with rural and trunk roads seeing more seasonal leisure riders. It is also worth noting that July sees a big switch from rural road collisions to trunk road collisions. **This would suggest July is the ideal month for running any campaigns focussed on P2W safety on trunk roads.**

Rider age

Figure 18 Seasonal trend by age group



This graph shows the seasonality of rider KSI involvements is less pronounced for younger riders than it is for those aged 26+ i.e. the line for 16-25 year olds is flatter than the line for riders aged 26+.

This seasonality tends to increase with age. For example 14% of involved riders aged 56+ have their KSI collision in July, compared to 10% of riders aged 26-35. While only 2.7% of involved riders aged

56+ have their collision in January, compared to 5% for riders aged 26-35. This increased seasonality suggests that for older riders P2Ws are more of an optional leisure activity they can choose to save for good weather, whereas younger riders may rely on them for year-round transport.

So although all riders are more likely to have their collision in summer, younger riders are more likely than older riders to have a collision in the 'off-season' during winter. This suggests a combination of the following factors may have an effect:

- Younger riders are more likely to ride through the year, possibly because they rely on the P2W as their primary means of transport.
- Younger riders are likely to be less experienced, and therefore less able to safely deal with adverse road, lighting and weather conditions encountered during winter.
- Older riders may be more likely to ride for pleasure and therefore less likely to go out in the adverse weather conditions more common in winter.

Key Findings:

There are more P2W KSI involvements during summer months (April to September) as more miles are ridden by P2W during the summer. This is especially true of leisure riding, but it still applies to commuter traffic albeit to a lesser extent.

There is a more distinct seasonal trend for the rural roads associated with leisure riding, compared to the less pronounced seasonal trend for urban roads associated with commuters.

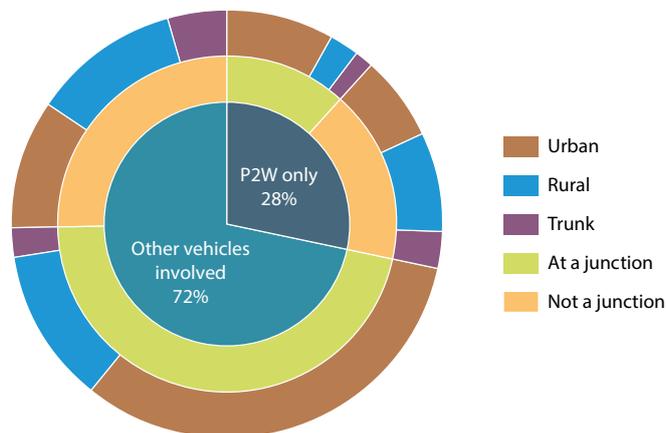
The seasonal trend is most pronounced for older riders, with younger riders more likely to ride through the whole year. This suggests younger riders are more likely to rely on their P2W as a means of transport, while older riders are more likely to ride for leisure.

Collision Analysis

Collision type

The chart below gives a breakdown of the P2W KSI collision types as defined by road, junction and presence of other vehicles. The inner ring shows whether it was a single or multiple vehicle collision, the middle ring shows if it was at a junction or not for each group in the inner ring. The outer ring shows road type for each group in the middle ring.

Figure 19: P2W KSI collision type



This data shows 72% of P2W KSIs involved other vehicles, 58% were at junctions and 57% were on urban roads.

This data also shows the four most common types of collision are:

- 1 Other vehicles involved, at a junction, urban road (33%)
- 2 Other vehicles involved, at a junction, rural road (12%)
- 3 Other vehicles involved, not at a junction, rural road (11%)
- 4 Other vehicles involved, not at a junction, urban road (10%)

The behaviours behind these types of collision will be examined in the next section.

Key Findings:

The most common type of P2W KSI collision involves a non-P2W vehicle at a junction on an urban road, with the second most common type involving a non-P2W vehicle at a junction on a rural road. 72% of P2W KSI collisions involve other non-P2W vehicles.

Road user behaviour

In theory matching combinations of vehicle-manoevre, points of impact and vehicle-position-in-the-road data as recorded in STATS19 should tell us the most common ways in which collisions occur between P2Ws and other vehicles. However, due to the number and ambiguity of options in these fields there are many ways of recording essentially the same collision, and various ways of interpreting each combination of vehicle location and manoeuvre data.

Therefore this section will only be able to identify broader themes in vehicle manoeuvre and position, and then infer what the most dominant types of collision mechanics are likely to be.

Urban junctions (multi vehicle)

Urban junction, multi vehicle	P2W Riders	Other vehicles
Top contributory factors	Failed to look properly (14%)	Failed to look properly (38%)
	Misjudged path/speed (12%)	Misjudged path/speed (15%)
	Careless/reckless (11%)	Careless/reckless (11%)
	Exceeding speed limit (9%)	Poor manoeuvre (11%)
Share of contributory factors	46%	54%
Collision types	Other vehicle right turn into path of P2W (40%)	
	P2W loss of control/head on impact (19%)	
	P2W filtering through traffic (11%)	
P2W rider profiles	32% aged 16-25 on bikes up to 125cc	
	26% aged 26-55 on 500cc+ bikes	

This data indicates the biggest issue at urban junctions to be other vehicles pulling into the path of P2Ws, primarily due to poor observational practices.

In some cases recklessness and excess speed on the part of the P2W rider may make it difficult for other drivers to correctly judge the speed of the P2W, and in other cases result in a loss of control by the P2W rider. Filtering and loss of control by P2W riders has also led to P2Ws crossing into oncoming traffic resulting in some head-on collisions. Around 1 in 10 of these collisions involve a P2W filtering through traffic or overtaking.

A range of rider types are involved in these collisions, but the biggest group are young riders on lower capacity bikes.

Rural junctions (multi vehicle)

Rural junction, multi vehicle	P2W Riders	Other vehicles
Top contributory factors	Misjudged path/speed (14%)	Failed to look properly (34%)
	Failed to look properly (13%)	Misjudged path/speed (19%)
	Poor manoeuvre (10%)	Poor manoeuvre (15%)
	Careless/reckless (10%)	Careless/reckless (9%)
Share of contributory factors	44%	56%
Collision types	Other vehicle right turn into path of P2W (42%)	
	P2W loss of control/head on impact (17%)	
	P2W filtering through traffic (16%)	
P2W rider profiles	51% aged 26-65 on 500cc+ bikes	

This data indicates the main issue at rural junctions to be other vehicles pulling into the path of P2Ws, primarily due to poor observational practices.

The issues appear similar to those for urban junctions, albeit with filtering/overtaking a bigger issue on rural roads than urban roads, and a bigger proportion involving middle aged riders on 500cc+ bikes.

Rural open road (multi vehicle)

Rural no junction, multi vehicle	P2W Riders	Other vehicles
Top contributory factors	Loss of control (16%)	Failed to look properly (25%)
	Poor manoeuvre (11%)	Careless/reckless (13%)
	Failed to look properly (10%)	Poor manoeuvre (12%)
	Misjudged path/speed (10%)	Misjudged path/speed (10%)
Share of contributory factors	67%	33%
Collision types	P2W loss of control on a left hand bend (25%)	
	Head on impact (possible overlap with above) (22%)	
	P2W filtering through traffic (18%)	
P2W rider profiles	50% aged 26-65 on 500cc+ bikes	

This data indicates that, unlike collisions at junctions, it is the P2W riders who contribute most to these collisions occurring. Filtering/overtaking is an even bigger issue, but loss of control is the main problem. This suggests behaviours such as excess speed and risky manoeuvres are more of an issue for rural open road collisions. The biggest rider group involved is middle aged riders on 500cc+ bikes.

Urban open road (multi vehicle)

Urban no junction, multi vehicle	P2W Riders	Other vehicles
Top contributory factors	Failed to look properly (12%)	Failed to look properly (26%)
	Misjudged path/speed (9%)	Poor manoeuvre (13%)
	Loss of control (9%)	Careless/reckless (12%)
	Careless/reckless (9%)	Misjudged path/speed (15%)
Share of contributory factors	62%	38%
Collision types	P2W loss of control/head on impact (19%)	
	P2W shunt other vehicle (16%)	
	P2W filtering through traffic (14%)	
P2W rider profiles	34% aged 16-25 on bikes up to 125cc	
	29% aged 26-55 on 500cc+ bikes	

This data indicates this is the type of scenario where P2W riders are most likely to contribute to a collision. This includes a range of collision types including head-on collisions, P2Ws shunting other vehicles and collisions occurring when P2Ws are filtering through traffic.

A range of rider types is involved in these collisions, but the biggest group are young riders on lower capacity bikes.

Key Findings:

Where P2Ws are involved in collisions with non-P2Ws at junctions, the driver of the non-P2W is the party most likely to contribute to the collision. However the opposite is true for collisions away from junctions.

Younger riders are the biggest user group in urban collisions, and riders of 500cc+ bikes are most prevalent in rural collisions.

The main issues for car/non-P2W drivers appear to be observational failings and making poor manoeuvres, particularly when performing right hand turns. Careless and reckless behaviour also feature in some cases.

The main issues for P2W riders appear to be poor observation while carrying out more risky manoeuvres (such as overtakes and filtering) and also when approaching junctions. Excess speed and loss of control (not always at the same time) also appear to put P2Ws in conflict with other traffic, especially on the rural roads away from junctions where bikes with 500cc+ engines are more frequently involved. On some occasions the excess speed is linked to the loss of control, but in other cases the loss of control occurs at normal road speed. Careless or reckless riding (including excess speed), misjudging speed and direction of other traffic, and loss of control are the most prevalent factors attributed to P2W riders on urban roads where young riders are most prevalent.

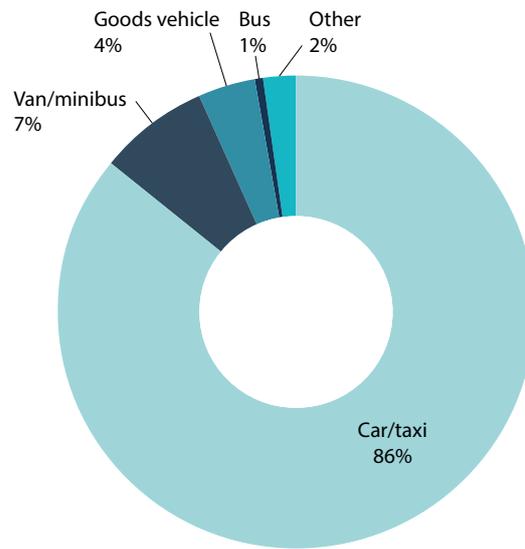
Non P2W Road users

This section examines the demographics and behaviours of non P2W road users involved in KSI collisions with P2W riders.

Demographics

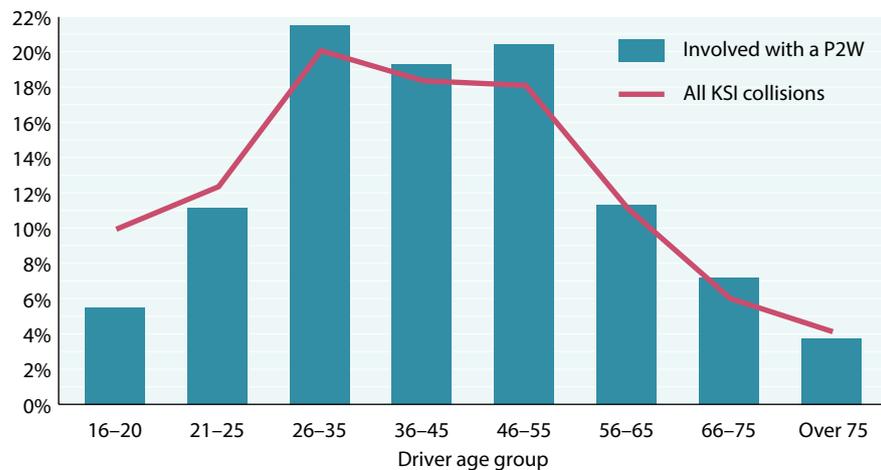
The chart below gives a breakdown of vehicle type involved in P2W KSI collisions. It shows the vast majority (93%) are cars, taxis vans and minibuses.

Figure 20: Types of non-P2W vehicle involved in P2W KSI collisions



The graph below shows the age distribution of non-P2W motorists involved in KSI collisions.

Figure 21: Non-P2W motor vehicle drivers involved in KSI collisions

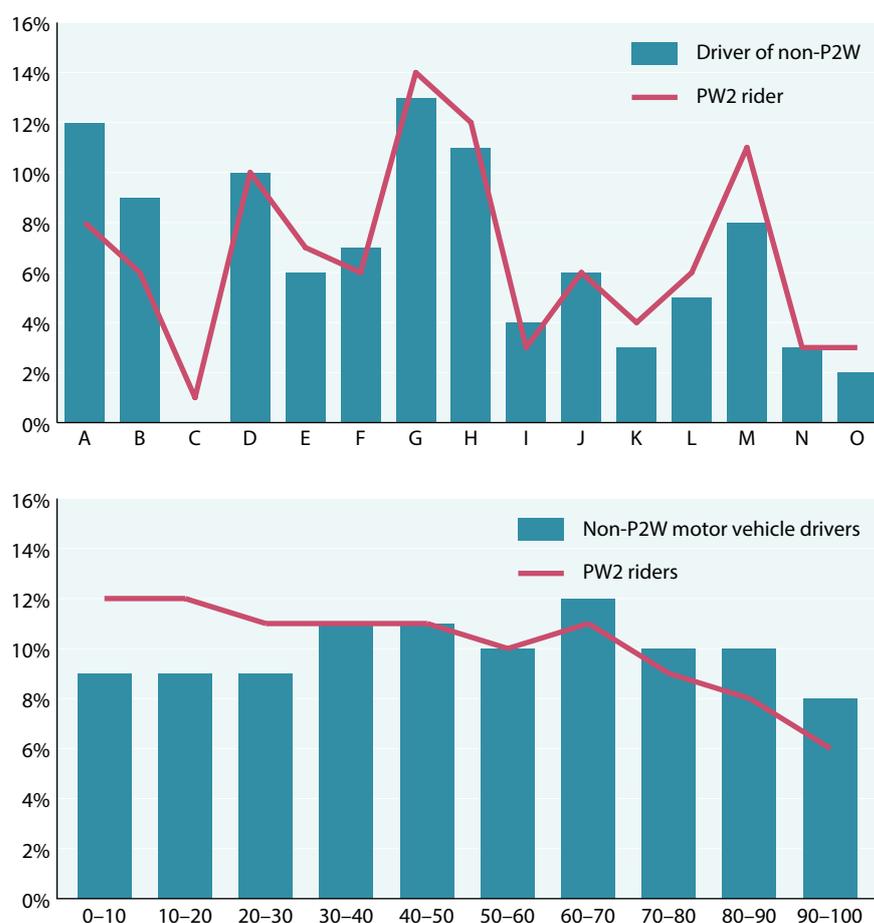


This indicates that the middle three age groups spanning ages 26-55 are over represented in collisions involving P2Ws, with younger drivers seemingly better at avoiding P2W collisions. This observation may be because younger drivers tend to make more 'unforced' errors in the absence of other vehicles,

so have a higher proportion of single vehicle collisions¹⁹. These 'extra' single vehicle collisions for younger drivers effectively dilute the proportion of KSI collisions that involved any other road user type, including P2Ws.

The graph in figure 32 may appear to contradict the established fact of young drivers posing a higher risk to others than middle aged drivers. However this graph shows total number of collision involvements; *collisions per vehicle mile* is the measure normally used to determine driver risk. Younger drivers account for fewer miles driven than middle aged drivers which is the reason for the lower overall number, despite their higher risk.

Figure 22: Mosaic and income deprivation comparison of drivers and riders involved in P2W KSI collisions



The graphs above show that compared to P2W riders, other vehicle drivers are more prevalent among the more affluent Mosaic types A and B, and less prevalent in the less affluent types K, M and O. This trend is reflected in income deprivation data showing P2W riders are much more likely than other vehicle drivers to come from the poorest 30% of the Eastern Region population. Other vehicle drivers are more likely than P2W riders to come from the wealthiest 40% of the population.

Overall, non P2W drivers are most likely to live in Mosaic type G, H and A areas, and are over represented in income deprivation deciles 30-50 (slightly below average income) and 60-70 (slightly above average income).

¹⁹ 2011-15 KSI data for the Eastern Region shows 33% of collisions involving car drivers aged 17-25 are single vehicle collisions, compared to 21% for drivers aged 26+

Key Findings:

93% of drivers of non-P2Ws involved in a P2W KSI were driving a car, taxi or van. They are slightly more likely than people involved in all types of KSI collision to be aged 26-55. They are less likely to come from areas of high income deprivation than P2W riders and more likely to come from the affluent Mosaic type A and B areas.

Manoeuvres

Overall, 63% of P2W KSI collisions involving other vehicles were at junctions. Nearly half of these (48%) involved the non-P2W turning right at a crossroads, T-junction or private drive. These types of collision comprise mainly vehicles turning right into the path of the P2W (fig. 23), but can also include P2Ws filtering through traffic (fig. 24).

Figure 23: Other vehicle right turn

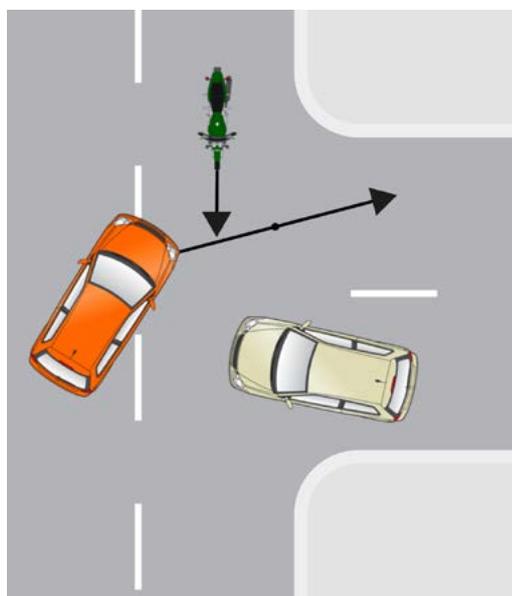
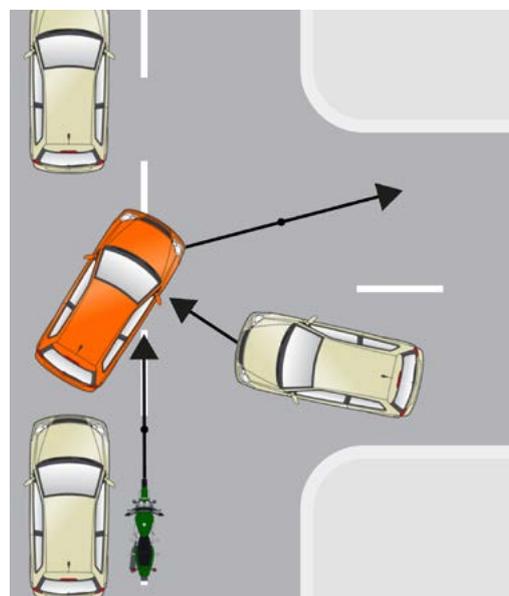
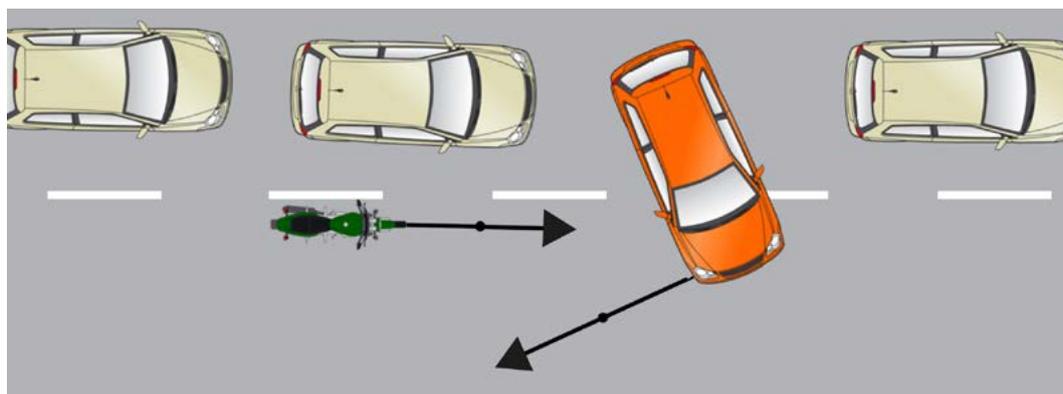


Figure 24: P2W filtering



Other types of collision can occur with P2Ws filtering through traffic, such as non P2W making a U-turn away from a junction (fig. 25) accounting for a further 3% of collisions.

Figure 25: P2W filtering other vehicle U-turn



“Shunts” where P2Ws go into the back of other vehicles slowing or stopping account for 15% of collisions, these occurred both on junction approaches and away from junctions. Other vehicles going into the back of P2Ws only accounted for 3.5%. Failures to give way at roundabouts accounted for a further 7% of P2W KSI involving other vehicles.

Table 11: Road type for P2W KSI collisions involving other vehicles

Road Type	P2Ws involved in KSI	Other vehicle involved in P2W KSI
Urban	56%	58%
Rural	33%	31%
Trunk	11%	11%

Table 11 shows there is very little difference in the road type breakdown of P2W KSI collisions when other vehicles are involved. The only difference is a slightly higher proportion of other vehicle involvements on urban roads.

Key Findings:

63% of P2W KSI collisions involving other vehicles were at junctions. Nearly half of these involved the non-P2W turning right at a junction, usually into the path of the P2W. P2Ws going into the back of other vehicles account for a further 15% of P2W KSI where non-P2Ws are involved.

Contributory Factors

The table below shows the main contributory factors attributed to non-P2W drivers involved in P2W KSI collisions. The highlighted cells show where factors in the three main collision types are more prevalent than they are in the “Other collision type” column.

Table 12: Proportion of contributory factors attributed to non-P2W riders involved in P2W KSI collisions

Row Labels	% P2W into rear of other vehicle	% other vehicle right turn into P2W at a junction	% roundabout collisions	% Other collision type
Failed to look properly	17%	30%	29%	19%
Failed to judge other persons path or speed	15%	16%	15%	10%
Careless/Reckless/ In a hurry	10%	11%	8%	8%
Poor turn or manoeuvre	7%	10%	11%	8%
Sudden braking	9%	1%	1%	5%
Other misc	42%	32%	34%	51%

In all cases, a failure to look properly is the most common factor. However this factor is fairly ubiquitous, so the columns where this factor is greatest indicate the areas where this is most likely to be a major issue. This shows that failing to look properly is mainly an issue at junctions. Misjudging the path or

speed of an approaching P2W is also an issue at junctions, and may reflect the investigating officer’s differing interpretations of the same circumstances where “failed to look properly” may be recorded as an alternative. Carelessness or recklessness and poor manoeuvres also each feature in around 10% of collisions at junctions.

Sudden braking is not a particularly common factor, but is present in almost 1 in 10 cases where a P2W goes into the back of another vehicle. Sudden braking is a factor in 7% of Bus/HGV>P2W KSI collisions and also in 7% of trunk road P2W>Other-vehicle KSI collisions. This is consistent with situations where drivers of smaller vehicles may be unable to see past larger vehicles, so have no prior warning of traffic ahead slowing before a larger vehicle appears to brake suddenly.

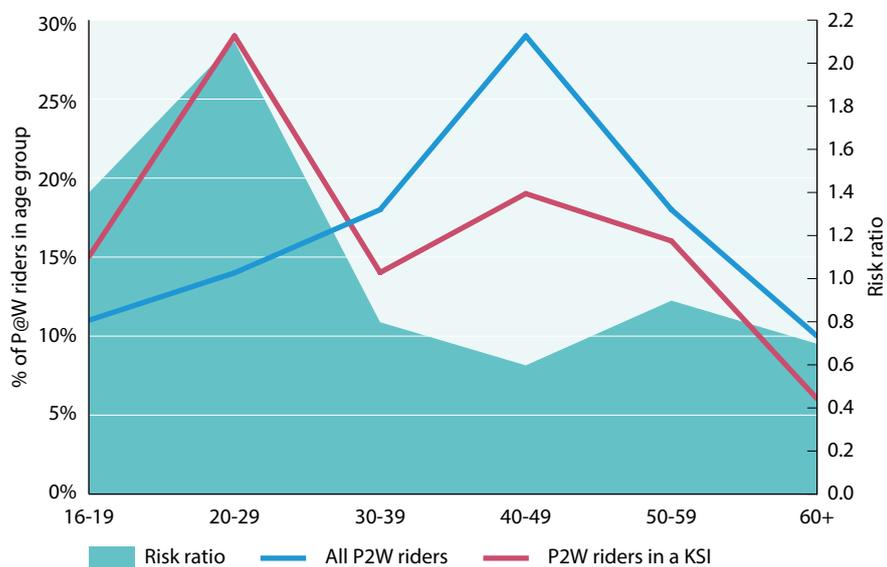
Key Findings:

The main issue for drivers of non-P2Ws at junctions is observation skills; either noticing the P2W approaching or accurately judging its path and speed. Careless driving and poor manoeuvres feature in about 1 in 10 P2W KSI collisions involving non-P2Ws at junctions.

Rider profiles

Comparing national travel survey data²⁰ showing the ages of all P2W riders with the ages of P2W riders involved in KSI collisions, indicates the risk of being involved in a KSI collision for riders within each age group. This is illustrated on the chart below.

Figure 26: All-rider and KSI involved rider age distribution



This shows riders under the age of 30 are involved in a disproportionate number of collisions, even for P2W riders. **With a risk ratio of 2.1, riders aged 20-29 have more than double the average risk of all P2W riders.** It also shows that nearly 30% of all riders (not just those involved in a collision) are in their 40s, and this age group has the lowest risk ratio.

²⁰ Table NTS0610 – Number of respondents who were motorcyclists.

There is a notable increase in risk from the 16-19 year old group to the 20-29 year old group. This may be influenced by factors including:

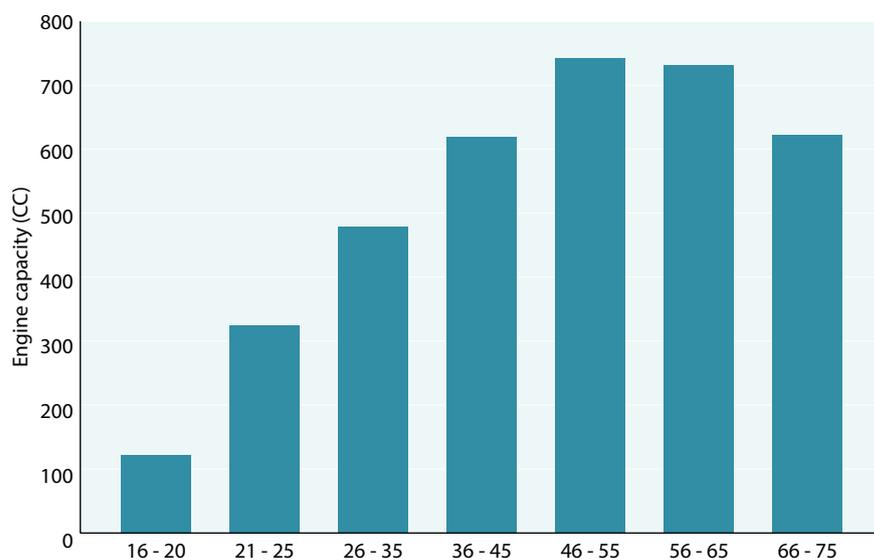
- More miles travelled by group – “All P2W riders” refers to the proportion of all P2W riders who are in each age group. It is a measure of the number of people in each age group and is not weighted for differences in total distance travelled. Although riders aged 40-60 appear to make the longest journeys by P2W, Riders in their 20’s appear more likely to use their bikes all year ‘round, so may travel more miles overall.
- A shift towards more powerful bikes as riders enter their mid 20s.
- Bad habits or over-confidence developing over time.

Key Findings:

Riders aged 20-29 have double the average risk of all P2W riders and are the age group which account for the greatest number of KSI. Riders aged 40-49 account for the second greatest number of KSI, but are the largest age group on the road and have about 60% the average risk for a P2W rider, and less than 30% of the risk of 20-29 year olds.

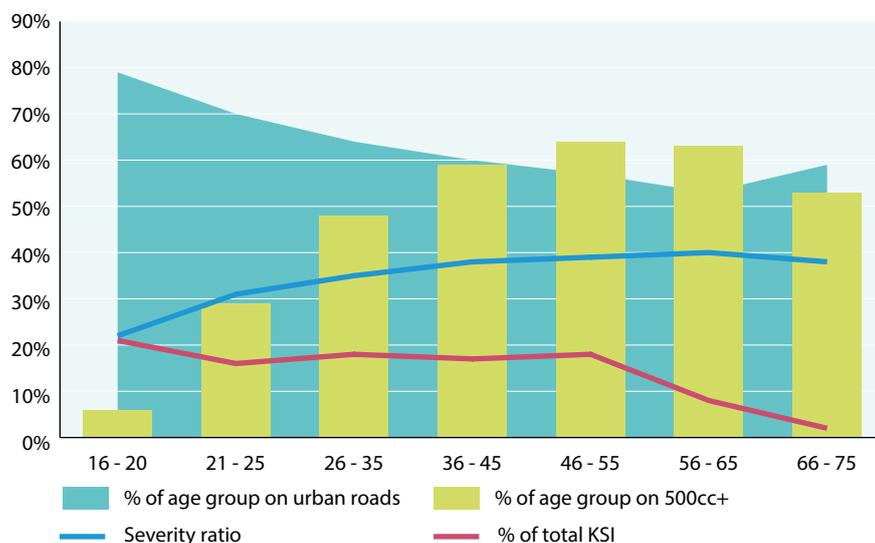
The graph below shows average engine capacity of motorcycles involved in collisions of all severities, by rider age group.

Figure 27: Average engine capacity by age group - all collision severities



This indicates riders continue to graduate onto bigger and bigger machines as they get older. After riders reach their mid-50s it appears many opt for slightly smaller bikes, but they are not returning to small capacity bikes in large numbers as the average engine size for the 66-75 year old age group is still over 600cc.

Figure 28: Various P2W casualty measures by age group



The graph above highlights the following age related trends among P2W riders involved in collisions of all severities:

- Severity ratio²¹ has a 98% correlation with the percentage of the age group riding bikes with engines over 500cc. This is consistent with the idea that bigger bikes = greater speed = more severe injuries. However, older riders tend to ride bigger bikes, and there may also be an effect resulting from reduced resilience to injury among older riders due to the physical ageing process of the body. This is consistent with the fact that “Statistically, older athletes are much more likely to injure themselves than younger athletes who are doing the same sport”²².
- The contribution to the total KSI figure made by each age group gradually reduces as riders get older. Referring back to figure 39 shows this cannot be a result of reduced numbers of riders since rider numbers increase between the ages of 16 and 49. This is a strong indicator that rider experience is a major factor in riders avoiding becoming involved in a KSI. This is consistent with the findings of a study²³ conducted by the European Transport Safety Council.
- The percentage of riders involved in collisions on urban roads is inversely proportional to the percentage on bikes with 500cc+ engines. This indicates smaller engines are more commonly used in urban areas, while larger engines are more commonly used on rural roads.

Key Findings:

Average engine size increases as riders approach their mid-fifties, as does the proportion having collisions on rural roads and the severity ratio of casualties.

The table below shows the breakdown of rider KSI involvements by engine size/age group combination.

Table 13: Rider age / engine size combination

²¹ The percentage of casualties of all severities that were either serious or fatal.
²² *Sports Injuries and the Aging Athlete*. John E. Morley, M.D. September 2000. From <http://www.thedoctorwillseeyounow.com/content/aging/art2075.html> accessed 24th January 2017.
²³ *Young road user risks: Is age the only fix?* Twisk, D. 2015. European Transport Safety Council. From <http://etsc.eu/wp-content/uploads/ETSC-lecture-versie-2.pdf> accessed 24th January 2017.

Rider Age	Up to 50cc	50-125cc	125-500cc	Over 500cc
16-20	7%	10%	2%	2%
21-25	1%	6%	2%	6%
26-35	1%	5%	2%	11%
36-45	1%	3%	2%	11%
46-55	0%	2%	2%	13%
56+	1%	1%	2%	6%

This shows two distinct groups, which between them account for over half of rider KSI involvements:

- Riders aged 26-55 on bikes over 500cc (35% of KSI involvement) – “Established riders”
- Riders aged 16-25 on bikes up to 125cc (24% of KSI involvement) – “Young riders”

Across all groups, 83% of involved riders are male

Most of the “Young Riders” group are on bikes with 50-125cc engines. Riders aged 17 or older can ride a bike up to 125cc, while those aged 16 are limited to 50cc machines. Riders of 50cc bikes tend to be at the younger end of this group, with more than two thirds of them being aged 16 or 17.

Peak time analysis for the “Established riders” group shows two clear trends; 23% of collisions occur during the afternoon at weekends and 29% occur during weekday commuting times. There is also a greater proportion of collisions on rural roads at weekends. This suggests “Established riders” may comprise two groups – “Commuters” (weekdays) and “Leisure Riders” (weekends). The following table compares these sub-groups:

Table 14: Comparison of commuter and leisure sub-groups within experienced riders group

	Commuter	Leisure
Average Engine capacity (cc)	738	823
Average distance (miles) home to collision	9.1	16.1
Average age of rider	41.1	42.4
Collision road type		
% Rural	36%	50%
% Urban	48%	33%
% Not at a junction	41%	53%
Rider home area type		
% Rural	12%	17%
% Small town	23%	16%
Least deprived 30%	25%	37%
Middle 40%	41%	34%
Most deprived 30%	34%	29%

The table above shows that leisure riders are more affluent, rider bigger bikes longer distances, and live and ride in less urban areas than commuter riders, confirming that “Established riders” comprise two distinct groups. Therefore the groups that will be examined in detail are:

- Young Riders (aged 16-25 bikes up to 125cc) – 23% of rider KSI involvements
- Commuters (weekday collisions, aged 26-65, any engine size²⁴) – 42%
- Leisure Riders (weekend collisions, aged 26-55, 500cc+ bikes) – 11%

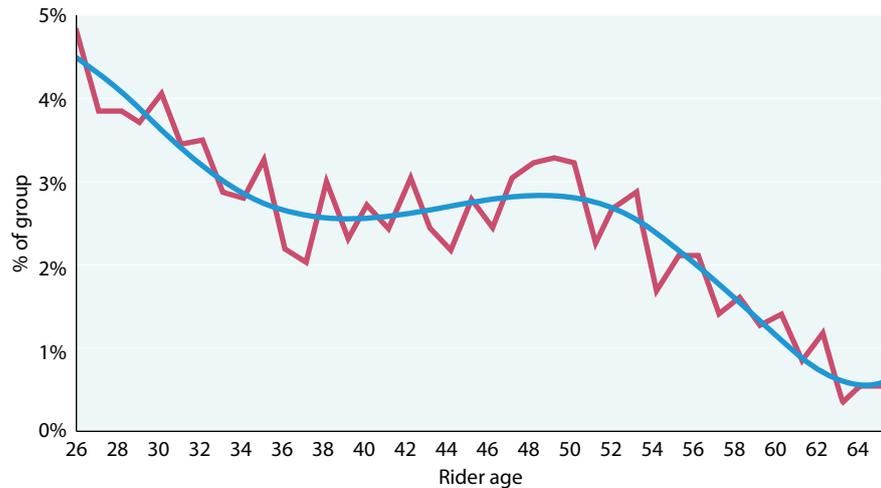
Key Findings:

76% of P2W riders involved in a KSI fall within one of three groups; “Young Riders” aged 16-25 on bikes up to 125cc, “Commuters” aged 26-65 having weekday collisions on various bikes, and “Leisure Riders” aged 26-55 having weekend collisions on 500cc+ bikes. 83% of involved riders are male.

“Commuters” Rider profile

- Riders aged 26-65 on weekdays account for 42% of all riders involved in a KSI.
- The chart below shows the age distribution of the commuters group.

Figure 29: Commuters age distribution



The graph above shows a gradual reduction in rider numbers with age. This is consistent with some riders moving to other modes of transport as they become more affluent, and others becoming better at avoiding collisions with more experience.

- The most common Mosaic profiles for this group are:
 - **Type H:** Younger households settling down in housing priced within their means (12.5%).
 - **Type G:** Householders living in inexpensive homes in village communities (11.9% of group).
 - **Type M:** Families with limited resources who have to budget to make ends meet (10.2%).

A table showing a breakdown of all Mosaic groups, and communications strategies for the groups highlighted above, can be found in the appendix.

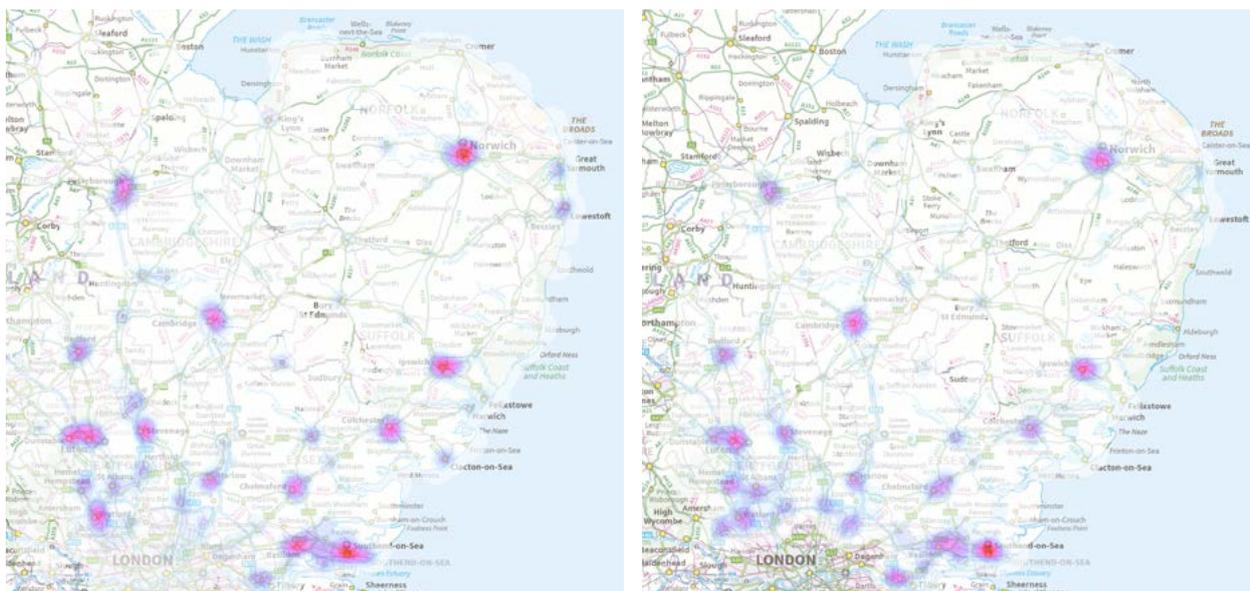
²⁴ Expanded from the initial scoping of 500cc+ engines and aged 26-55 to include all potential commuters who are not young riders, so will be based on slightly different data to that used in figure 43.

- Average distance: Home address > KSI Collision location = 10.2 miles. *This is compared to 3.7 miles for the Young Rider group and 16.1 miles for the leisure riders group.*
- Peak time analysis: As per the definition of this group, peak times are Monday to Friday 1600-1900, with a lesser peak from 0700 to 0900.
- The maps below compare home address hotspots with collision hotspots for commuters.

Figure 30: Home address and KSI collision hotspots for riders in the “Commuters” group

Home Address Hotspots

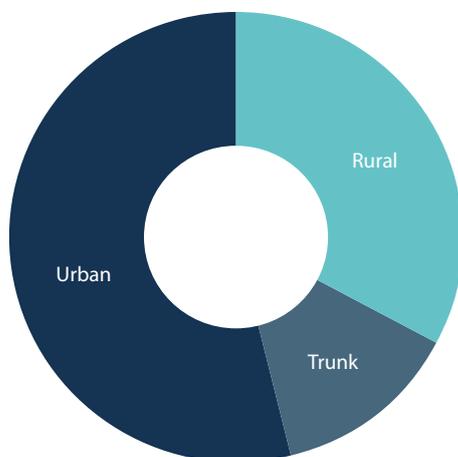
KSI Collision Hotspots



These hotspot maps show commuter riders home addresses are concentrated in the main towns of Luton, Watford, Stevenage, Norwich, Ipswich, Cambridge, Peterborough, Chelmsford, Colchester, Basildon and Southend. Collision hotspots are similar, but show a slightly more dispersed pattern, with a greater number of less intense hotspots.

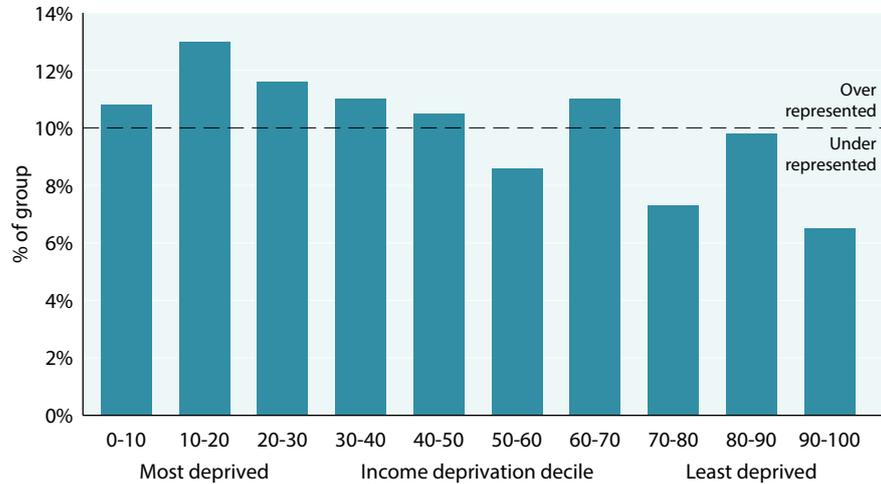
- Road type: The chart below shows that over half of commuter KSI collisions occur on urban roads.

Figure 31: Road type – Commuters KSI collisions



- Deprivation data shows this group is slightly over represented in deciles 0 to 50, and under represented in more affluent areas.

Figure 32: Income deprivation deciles - “Commuters”



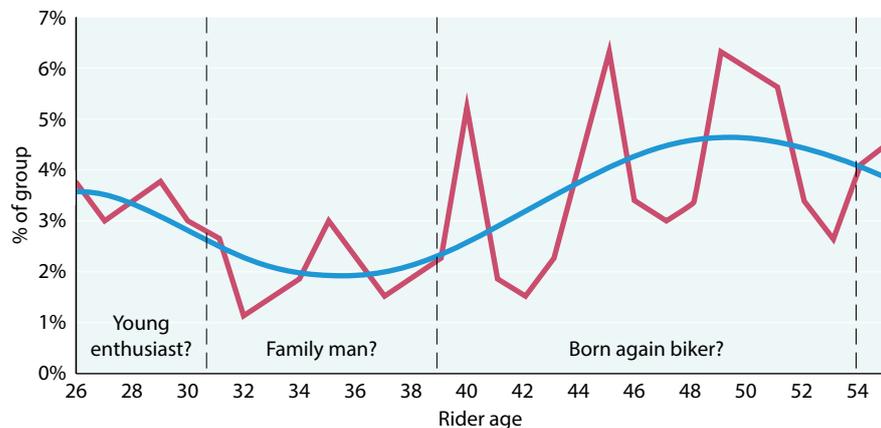
Key Findings:

Riders in this group are concentrated at the younger end of the 26-65 age group, but with a secondary peak age in their mid to late forties. They tend to have collisions on urban roads during afternoon commuting times, with a smaller morning peak, an average of about 10 miles from where they live. These riders tend to live in areas of lower than average incomes. Almost 12% live in Mosaic type G areas (village communities) some of which may be underserved by affordable public transport alternatives.

“Leisure Riders” profile

- Riders aged 26-55 on 500cc+ bikes at weekends account for 11% of all riders involved in a KSI.
- The chart below shows the age distribution of the leisure riders group.

Figure 33: Leisure riders age distribution



The graph above shows that engagement for the Leisure Riders group will have the most potential impact if designed to appeal to riders aged 45-55.

- The most common Mosaic profiles for this group are:
 - **Type G:** Householders living in inexpensive homes in village communities (12.9% of group).
 - **Type H:** Younger households settling down in housing priced within their means (11.6%).
 - **Type D:** Thriving families who are busy bringing up children and following careers (11.6%).

A table showing a breakdown of all Mosaic groups, and communications strategies for the groups highlighted above, can be found in the appendix.

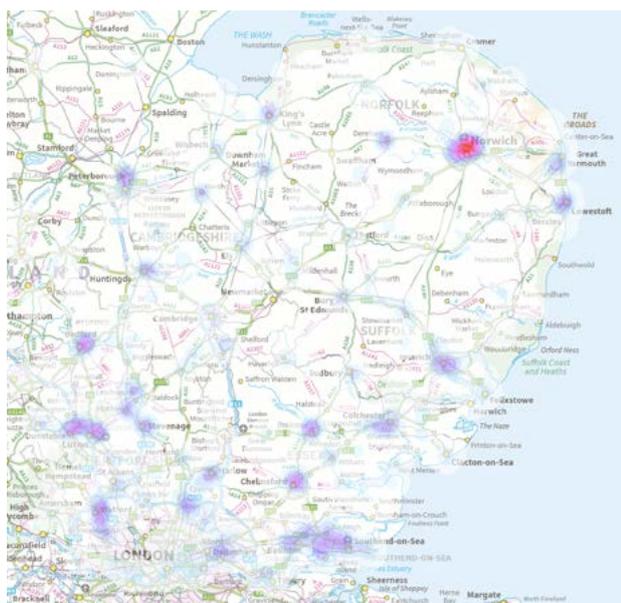
- Average distance: Home address > KSI Collision location = **16.1 miles**. *This is compared to 3.7 miles for the Young Rider group and 10.2 miles for the commuters group.*
- Peak time analysis: Peak times for this group are Saturdays and Sundays from 1100 to 1700, with a slightly more collisions on Sundays.
- The hotspot maps on the next page show leisure rider home address hotspots concentrated in the main towns in the region, with a particular concentration in Norwich. Although a hotspot in Norwich would be expected due to it being the biggest city in the region, it is much more pronounced than it is for the “Commuters” group. The level of dispersal when looking at the collision location map is much more pronounced, reflecting the greater distances, and more rural routes travelled by leisure riders compared to commuters. This makes targeted intervention on the road more problematic, pointing towards interventions based on rider home addresses, rather than where they have collisions.

However there are still some clear targetable hotspots including Southend, Thurrock, Watford and Kings Lynn, as well as the local authority areas of Epping Forest, Hertsmere and Three Rivers identified in the Cross Border Activity section of this document.

- The maps below compare home address hotspots with collision hotspots for leisure riders.

Figure 34: Home address and KSI collision hotspots for riders in the “Leisure Riders” group

Home Address Hotspots

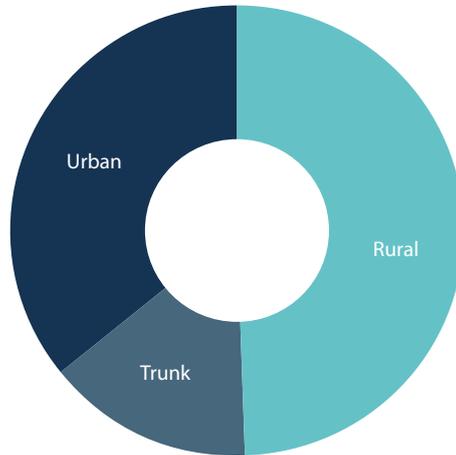


KSI Collision Hotspots



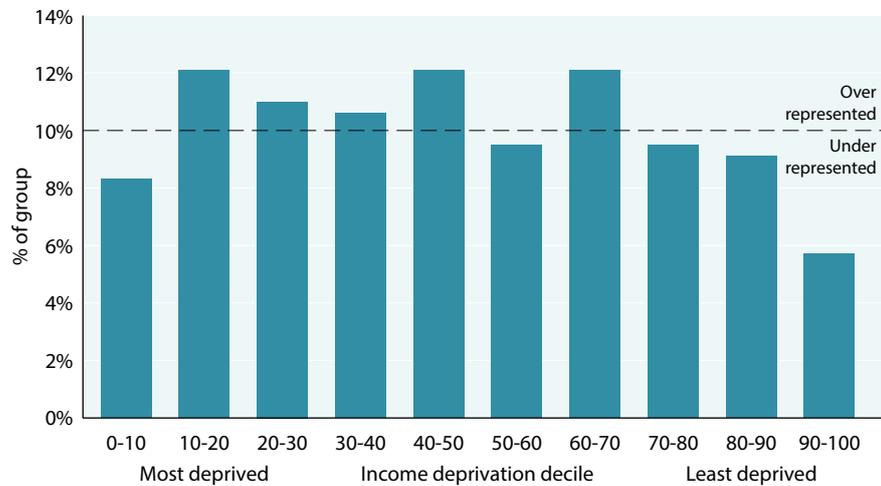
- Road type: The chart below shows that around half of the leisure riders collisions occur on rural roads.

Figure 35: Road type – Leisure Riders KSI collisions



- Deprivation data shows this group is slightly over represented in deciles 10 to 50 and 60-70. This shows Leisure riders are the least deprived of the three main groups, but are still over represented in more deprived areas, and under-represented in more affluent areas.

Figure 36: Income deprivation deciles - "Leisure riders"



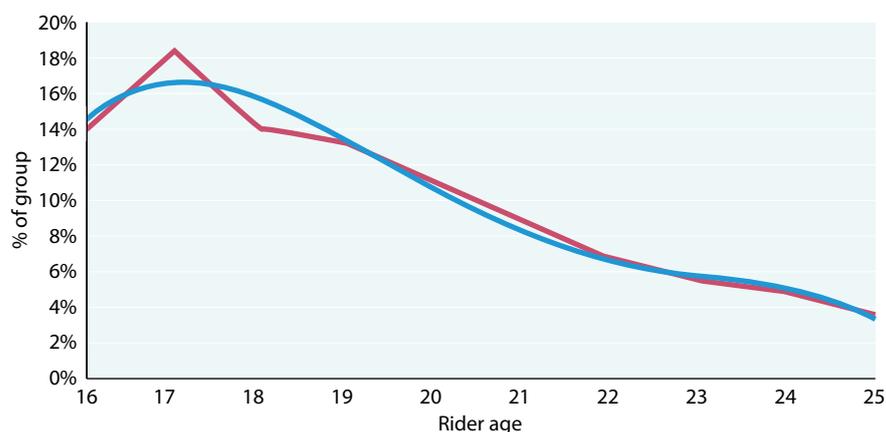
Key Findings:

Riders in this group are most likely to be aged in their mid-forties to early-fifties. They tend to have collisions on rural roads during afternoons at the weekend, particularly Sundays. Consequently their collision locations are fairly dispersed, resulting in fewer areas suitable for on-the-road interventions. They appear to ride further than the commuter group, averaging 16 miles from home to collision location. Although over represented in areas of lower than average incomes, they are on average more affluent than other P2W rider groups.

“Young Riders” Rider profile

- Riders aged 16-25 on bikes with engines up to 125cc account for 23% of riders involved in a KSI.
- The chart below shows the age distribution of the young rider group.

Figure 37: Young Rider age distribution

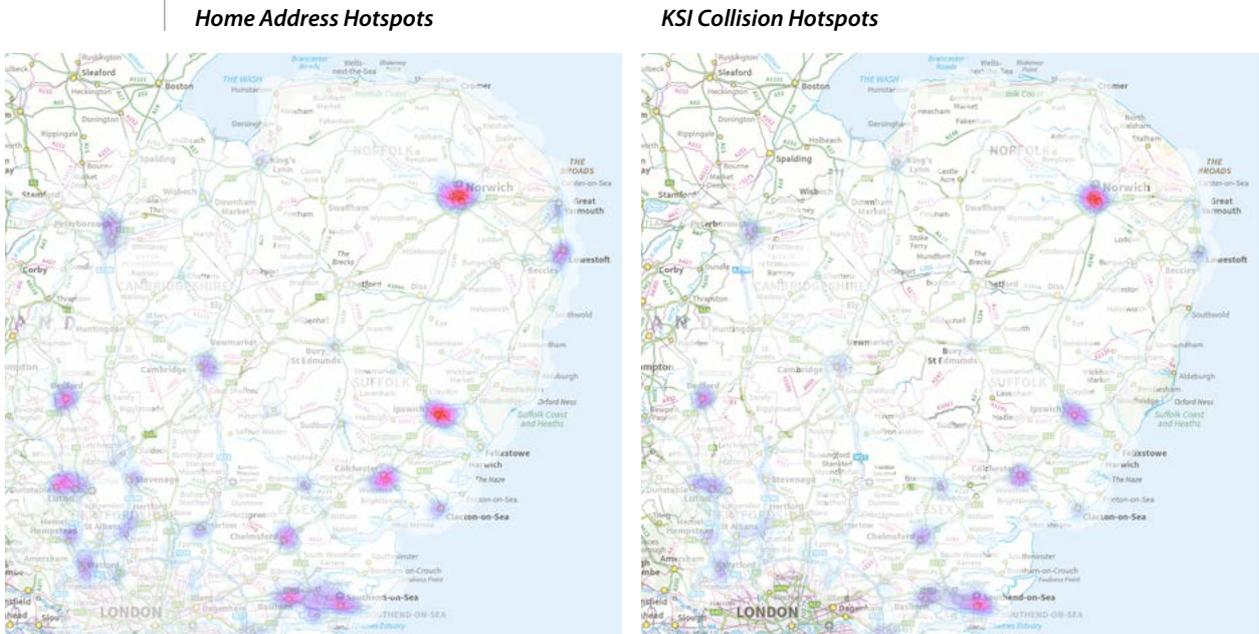


This shows that riders are concentrated towards the younger end of the age group, particularly 16-19 year olds, with a drop in rider involvements between the ages of 19 and 21. This is consistent with some riders moving to other modes of transport or bigger bikes as they become more affluent, and others becoming better at avoiding collisions with more experience.

- The most common Mosaic profiles for this group are:
 - **Type G:** Householders living in inexpensive homes in village communities (17.8% of group)
 - **Type M:** Families with limited resources who have to budget to make ends meet (15.8%)
 - **Type H:** Younger households settling down in housing priced within their means (12.9%)

A table showing a breakdown of all Mosaic groups, and communications strategies for the groups highlighted above, can be found in the appendix.
- Average distance: Home address > KSI Collision location = **3.7 miles**. *This is compared to 10.2 miles for the commuters group and 16.1 miles for the leisure riders group.*
- Peak time analysis shows three peak times for the group:
 - Weekdays 3pm to 7pm (26% of KSI collisions)
 - Weekdays 7am to 9am (12%)
 - Saturdays Noon to 10pm (12%)
- The maps below compare home address hotspots with collision hotspots for young riders.

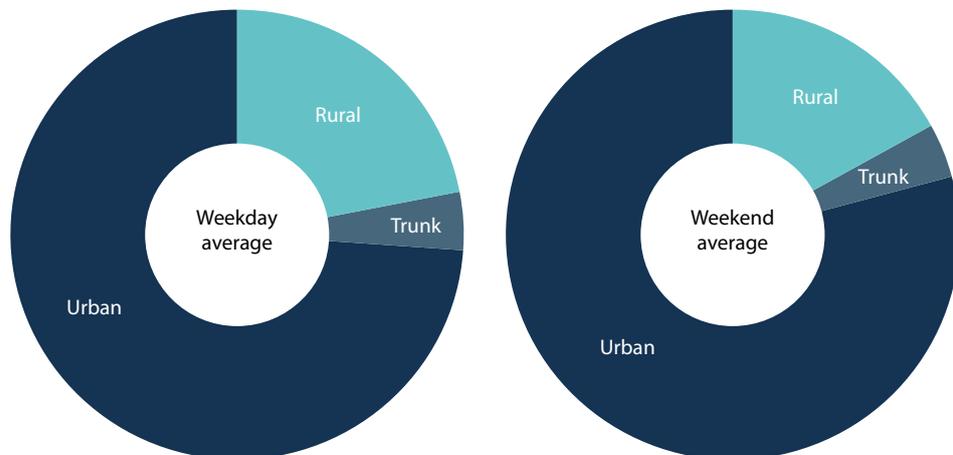
Figure 38: Home address and KSI collision hotspots for riders in the “Young Riders” group



The hotspot maps show very little difference between home address hotspots and KSI collision hotspots, reflecting the short average distance between rider home and collision location. As with other groups, hotspots are located in centres of population, with Norwich, Ipswich, Colchester, Luton and the Southend/Basildon conurbation being the most concentrated hotspots.

- Road type: The charts below show this group has the vast majority of their collisions on urban roads, both on weekdays and at weekends. This suggests similar types of journey for this group throughout the week, although the purpose may be different²⁵, and with the low average distance from home to collision, it suggests most journeys and collisions are within the town where the rider lives.

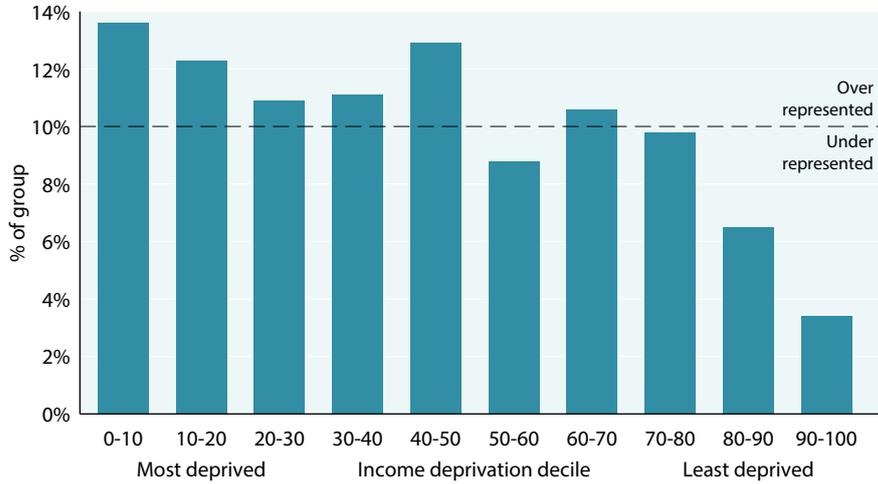
Figure 39: Road type - Young Rider KSI collisions



²⁵ “Journey purpose” is a STATS19 field but it is populated too infrequently to allow any useful analysis.

- Deprivation data shows this group is slightly over represented in deciles 0 to 50, being most over represented in the most income deprived decile of 0-10. This suggests many may ride a P2W out of financial necessity, rather than a specific desire to ride a motorcycle.

Figure 40: Income deprivation deciles - "Young riders"



Comparison with young drivers

The charts below compare demographic and behavioural factors associated with young P2W riders and young car drivers involved in KSI collisions in the Eastern Region.

Figure 41: Socio-demographic comparison of young drivers and young riders

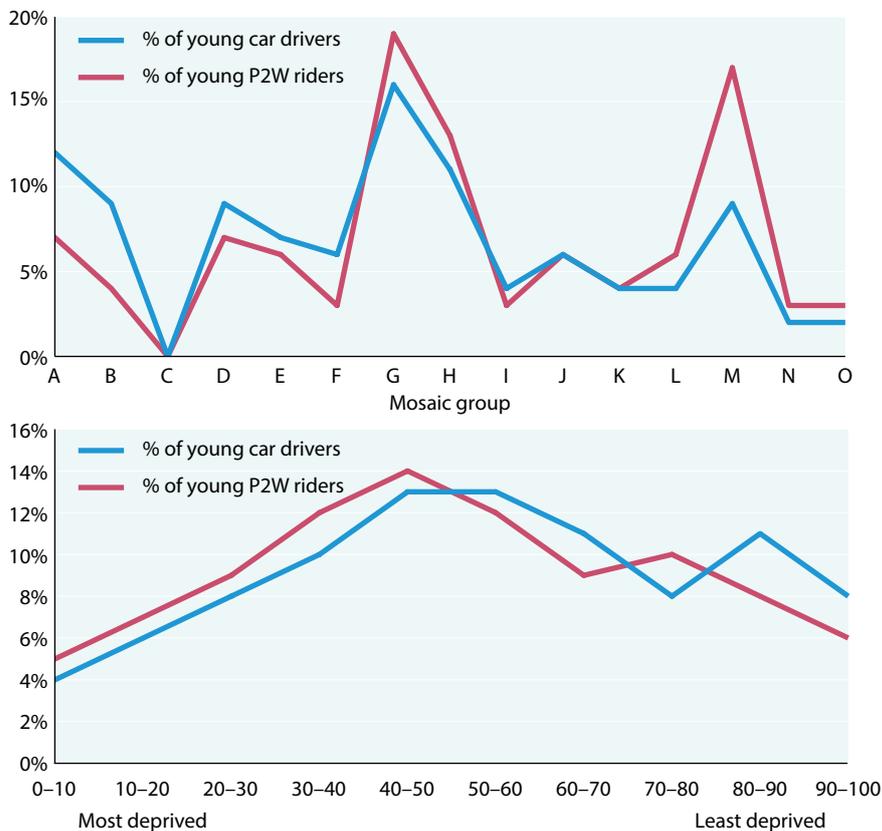
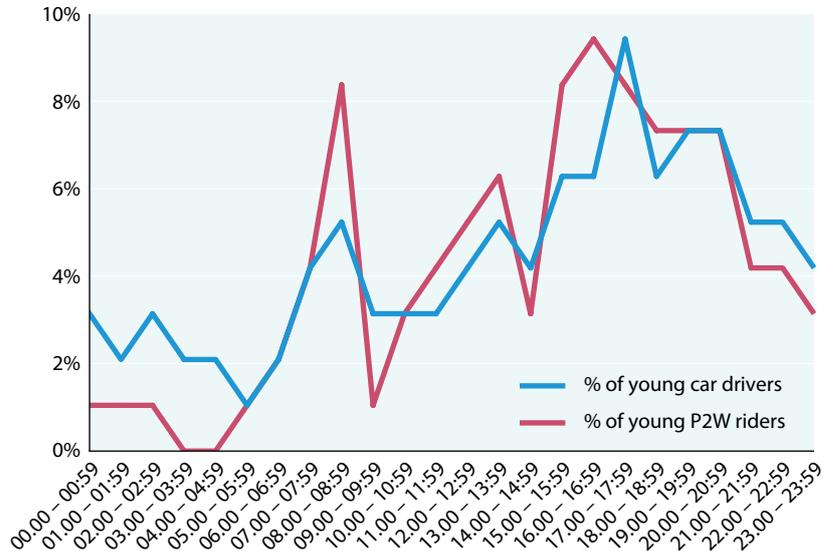


Figure 42: Peak time comparison of young drivers and young riders

	Young drivers	Young P2W Riders
Manoeuvre		
% Going ahead	69%	73%
% Overtaking	4%	11%
% Turning	12%	6%
Road Type		
Urban	47%	75%
Rural	41%	22%
Trunk	12%	3%
Gender		
Female	33%	6%
Male	67%	94%
At a junction	41%	65%



These comparisons show the following:

- Young drivers and young riders have many similar demographic traits, but the main difference between the two groups is that young riders tend to be from more deprived areas, especially Mosaic Group M areas (Families with limited resources who have to budget to make ends meet).
- While young drivers and riders all have more collisions on urban roads than rural or trunk roads, young rider collisions are much more concentrated in urban areas, and also more likely to be at a junction.
- The majority of both groups are male, but young riders are much more overwhelmingly male than young drivers.
- Peak times are similar for both groups, but the morning peak is more pronounced for young riders and the afternoon peak begins sooner.

This suggests that some young P2W engagement could “piggy back” on more general young driver initiatives, but it is important to include specific engagement to address the issues most pertinent to young P2W riders.

Key Findings:

Mosaic, deprivation and age distribution data suggests many individuals in the “Young Riders” group may be influenced by financial or transport availability related factors, more than a specific desire to ride a motorcycle.

The fact that the vast majority of collisions occur on urban roads throughout the week and weekend, combined with the average distance from home to collision of 3.6 miles, indicates Young Riders do not usually travel long distances.

A combination of inexperience, low quality CBT training, and greater numbers on the road may be a reason for the greater number of riders at the younger end of this age group being involved in KSI collisions. As riders reach their early to mid-20s, they may avoid collisions due to experience and maturity, and be fewer in number as other options such as car ownership become viable.

Comparison of young drivers with young P2W riders suggests that some young P2W engagement could “piggy back” on more general young driver initiatives, but it is important to include specific engagement for young P2W riders to address the issues most pertinent to this group.

Appendices

Registered P2Ws by Eastern Region Police Force

Registered P2Ws	2011	2012	2013	2014	2014
Bedfordshire	12,036	11,805	11,890	12,018	12,018
Cambridgeshire	18,844	18,387	18,398	18,468	18,468
Essex	38,938	38,476	38,284	38,687	38,687
Hertfordshire	22,578	21,738	21,646	21,606	21,606
Norfolk	25,624	25,163	24,753	25,153	25,153
Suffolk	21,782	21,432	21,215	21,331	21,331
Eastern Region	139,802	137,001	136,186	137,263	137,263

Involved rider local authority import and export rates

District	% of local riders having collisions elsewhere (export rate)	District	% of local collisions involving non-local riders (import rate)
Stevenage	73%	Cambridge	76%
Cambridge	67%	Epping Forest	73%
Forest Heath	65%	South Cambridgeshire	70%
Castle Point	58%	Three Rivers	67%
South Cambridgeshire	54%	Stevenage	65%
Rochford	52%	East Hertfordshire	65%
Watford	52%	Forest Heath	65%
Harlow	52%	Hertsmere	62%
Broadland	49%	North Hertfordshire	61%
Maldon	47%	Brentwood	60%
North Hertfordshire	47%	Broxbourne	57%
Great Yarmouth	46%	Breckland	56%
St. Edmundsbury	45%	Uttlesford	56%
Babergh	44%	Watford	56%
East Hertfordshire	44%	Maldon	55%
Three Rivers	43%	St. Edmundsbury	54%
Central Bedfordshire	42%	South Norfolk	54%
Luton	41%	Central Bedfordshire	53%
Braintree	40%	Braintree	53%
Colchester	40%	Norwich	52%
Norwich	39%	St. Albans	51%
Brentwood	39%	Rochford	50%
Fenland	39%	Thurrock	49%
Mid Suffolk	39%	East Cambridgeshire	49%
Uttlesford	38%	Babergh	49%
Chelmsford	38%	Welwyn Hatfield	48%
Ipswich	37%	Harlow	47%
Huntingdonshire	37%	Huntingdonshire	47%
Breckland	36%	Mid Suffolk	46%
Basildon	35%	Broadland	45%
Epping Forest	34%	Chelmsford	43%
South Norfolk	34%	Basildon	43%
Dacorum	33%	Dacorum	43%
Welwyn Hatfield	33%	King's Lynn and West Norfolk	43%
Tendring	33%	Bedford	43%
King's Lynn and West Norfolk	32%	Tendring	41%
North Norfolk	32%	Suffolk Coastal	40%
Suffolk Coastal	30%	Colchester	39%
East Cambridgeshire	28%	Castle Point	39%
Waveney	27%	Southend-on-Sea	39%
Southend-on-Sea	27%	Great Yarmouth	38%
Bedford	24%	Fenland	36%
St. Albans	23%	Luton	34%
Hertsmere	23%	North Norfolk	32%
Broxbourne	20%	Peterborough	29%
Thurrock	17%	Ipswich	29%
Peterborough	13%	Waveney	19%

P2W rider KSI collision involvements by local authority area of collision

Local Authority Area	Population (2014 estimate)	P2W riders involved in KSI 2011-15	KSI involvements per 10k population
Epping Forest	128,777	100	7.77
East Cambridgeshire	86,685	61	7.04
Breckland	133,986	94	7.02
Braintree	149,985	104	6.93
Mid Suffolk	99,121	65	6.56
South Norfolk	129,226	84	6.50
Norwich	137,472	89	6.47
St. Edmundsbury	112,073	72	6.42
Maldon	62,767	40	6.37
Chelmsford	171,633	102	5.94
South Cambridgeshire	153,281	91	5.94
Uttlesford	84,042	48	5.71
King's Lynn and West Norfolk	150,026	82	5.47
Rochford	84,776	46	5.43
Three Rivers	90,423	49	5.42
Forest Heath	62,812	34	5.41
Bedford	163,924	87	5.31
Colchester	180,420	95	5.27
Southend-on-Sea	177,931	93	5.23
Broadland	125,961	65	5.16
Ipswich	134,966	69	5.11
Hertsmere	102,427	52	5.08
Tendring	139,916	70	5.00
Waveney	115,919	57	4.92
Central Bedfordshire	269,076	132	4.91
Thurrock	163,270	79	4.84
Suffolk Coastal	124,776	58	4.65
Brentwood	75,645	35	4.63
St. Albans	144,834	67	4.63
Peterborough	190,461	86	4.52
North Hertfordshire	131,046	59	4.50
Fenland	97,732	44	4.50
Basildon	180,521	79	4.38
Dacorum	149,741	63	4.21
Huntingdonshire	173,605	73	4.20
Welwyn Hatfield	116,024	46	3.96
Babergh	88,845	35	3.94
Cambridge	128,515	50	3.89
North Norfolk	102,867	38	3.69
East Hertfordshire	143,021	51	3.57
Watford	95,505	34	3.56
Harlow	84,564	30	3.55
Castle Point	88,907	31	3.49
Great Yarmouth	98,172	34	3.46
Stevenage	85,997	26	3.02
Broxbourne	95,748	28	2.92
Luton	210,962	56	2.65
Eastern Region	6,018,383	2,983	4.96

Roads included in route analysis

Top 22 classified roads by total KSI collisions:

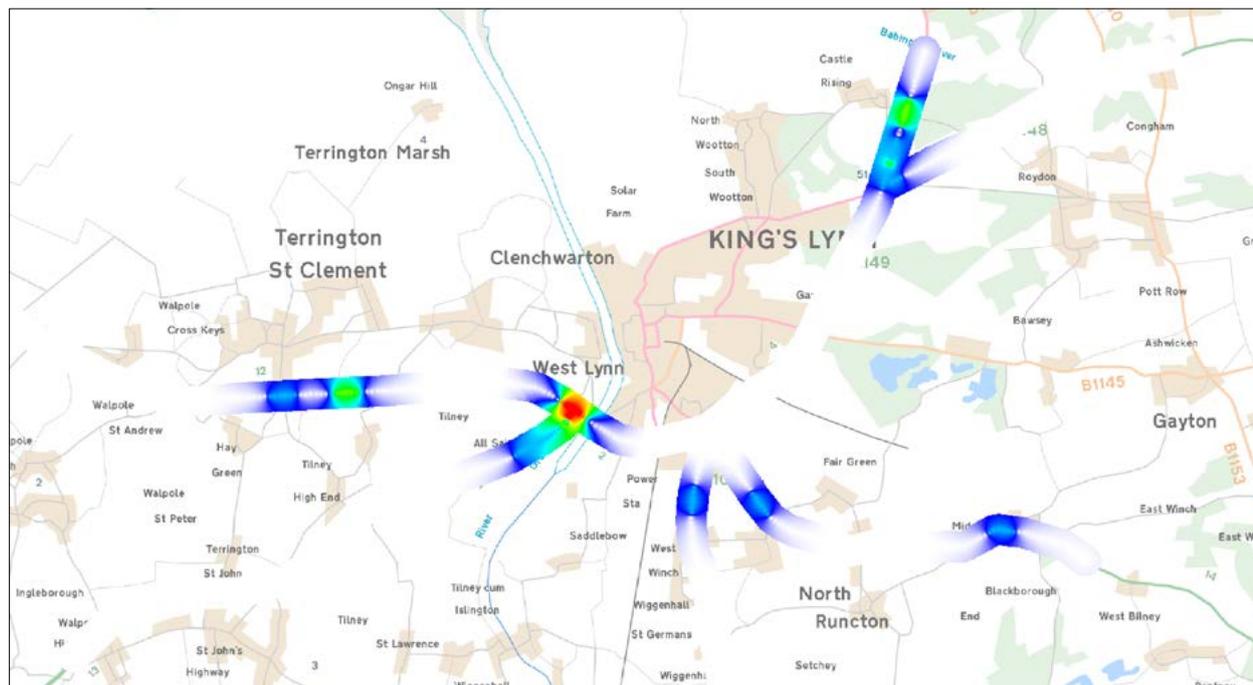
A1	A13	A143	A47	M11
A10	A131	A149	A5	M25
A12	A14	A41	A505	
A120	A140	A414	A507	
A127	A142	A428	M1	

Other major roads also included:

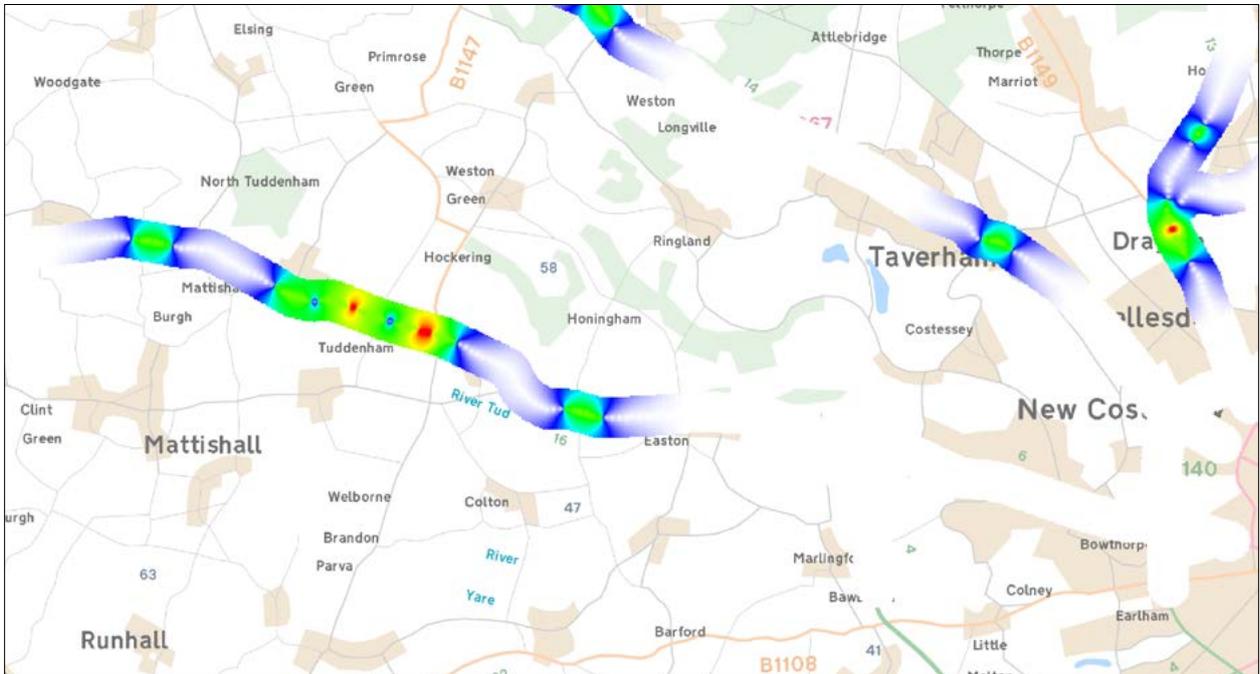
A1012	A1074	A1122	A133	A17	A605
A1017	A1075	A1123	A134	A412	
A1065	A11	A1151	A141	A421	
A1066	A1101	A130	A146	A6	
A1067	A1120	A1307	A148	A602	

Route Analysis close-ups

- 1 A17 / A47 junction west of Kings Lynn and A149 north of Kings Lynn.



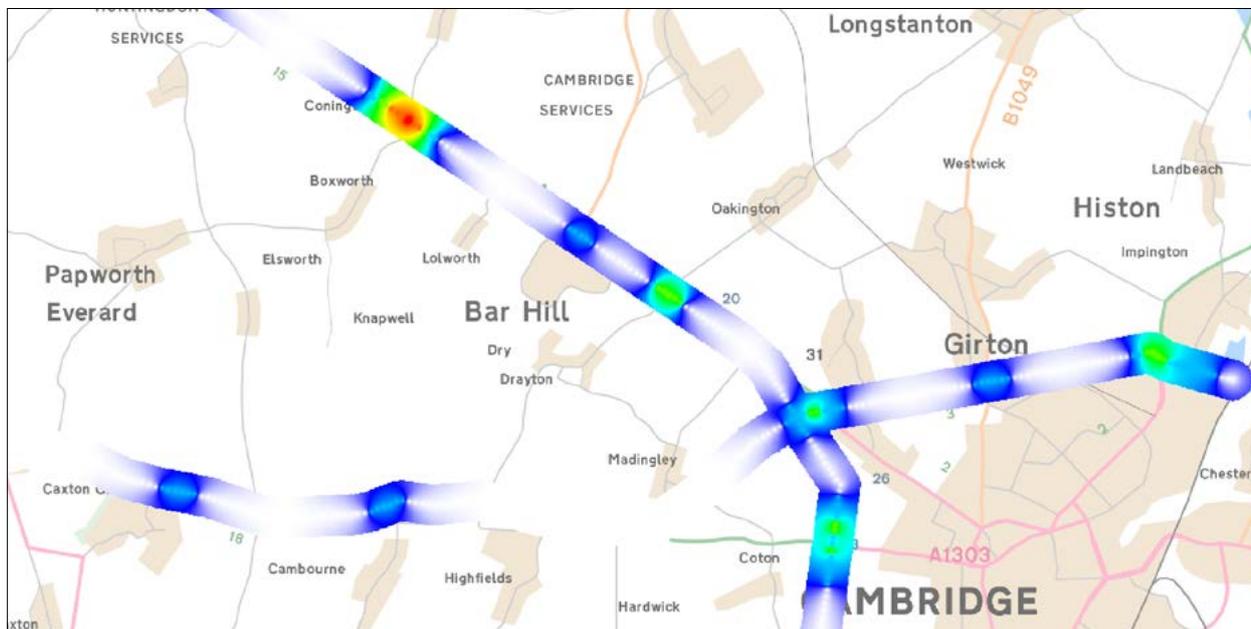
2 A47 west of Norwich



3 A142 south of Mildenhall



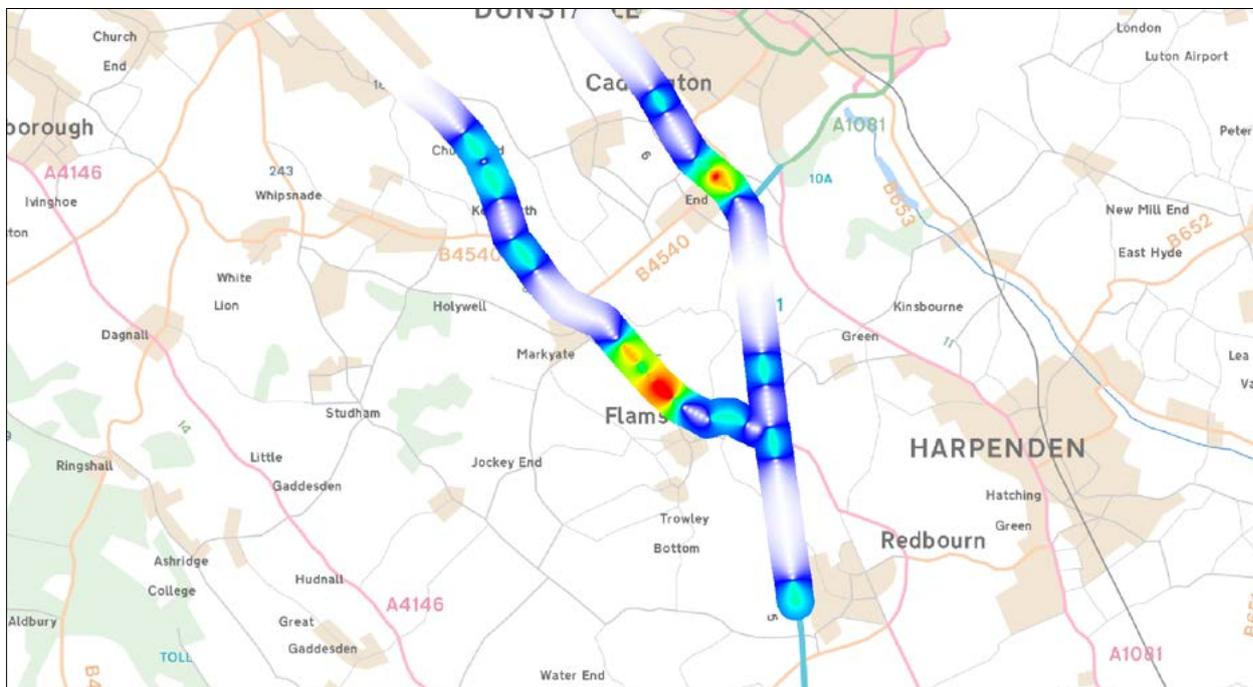
4 A14 north-west of Cambridge



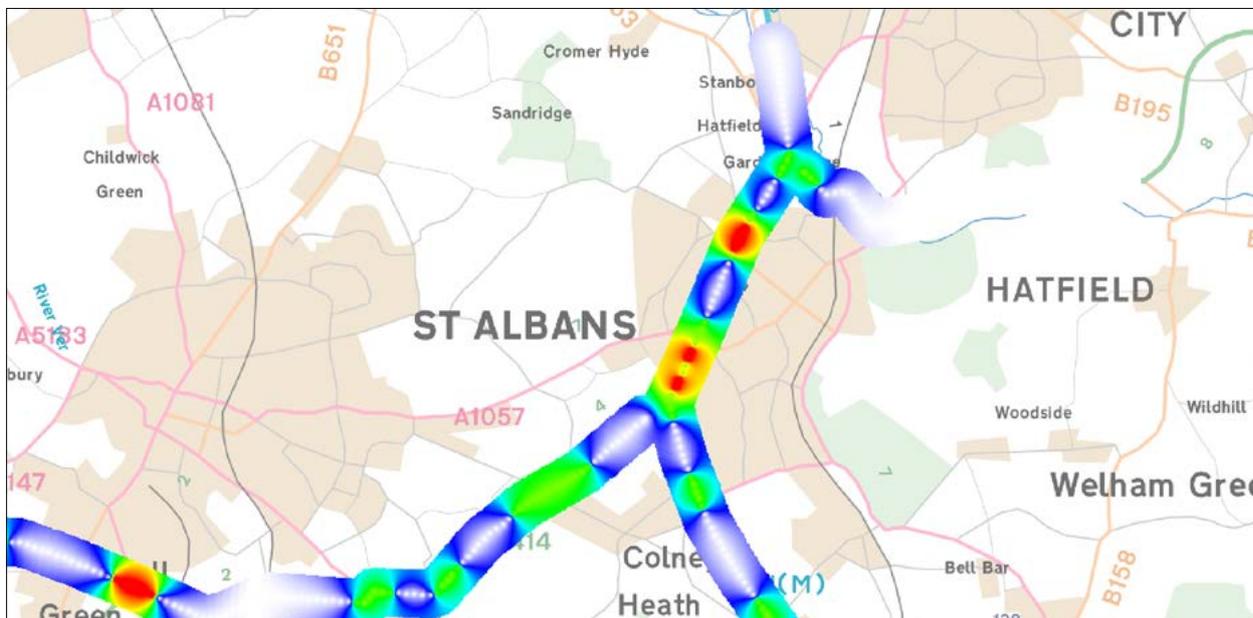
5 A11 junction with A505



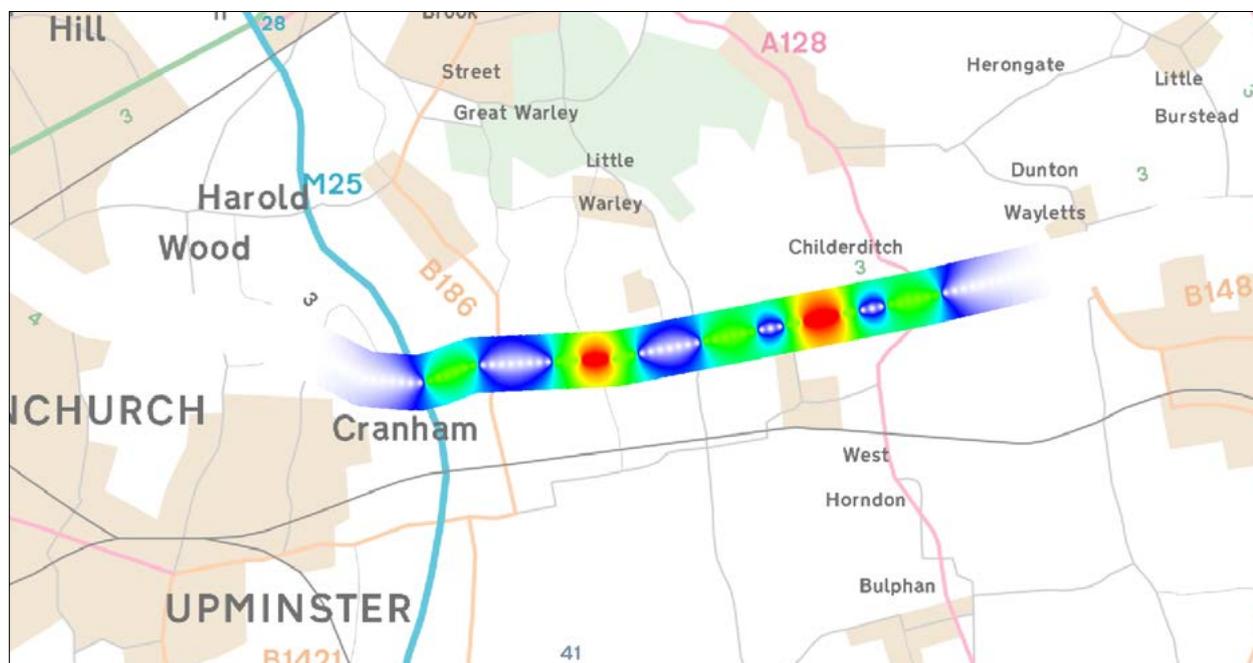
6 A5 south of Dunstable



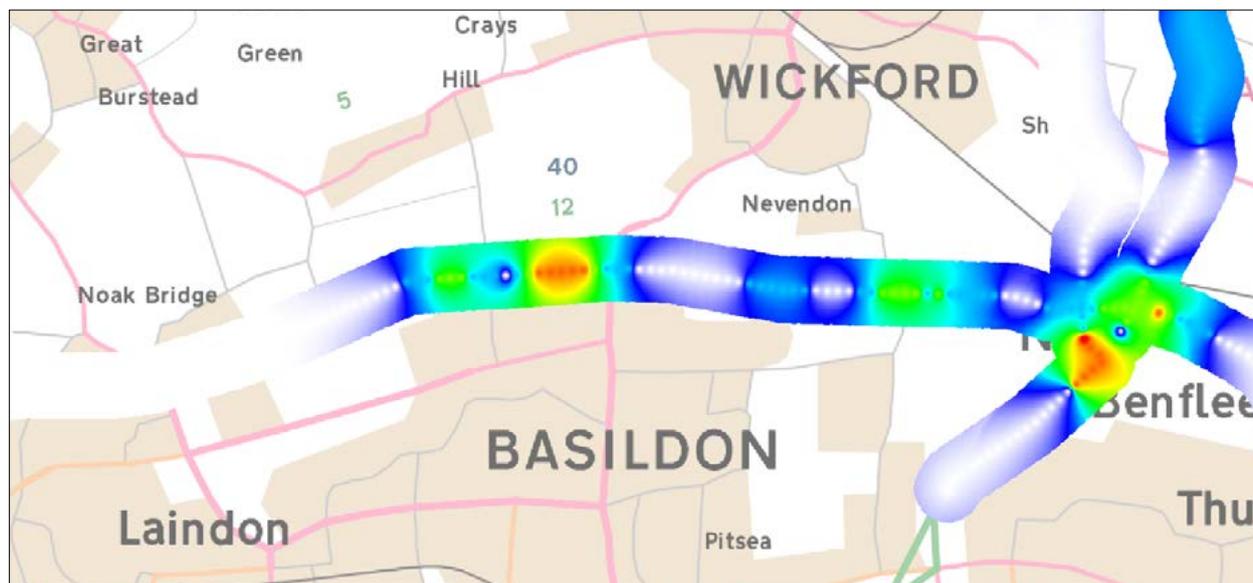
7 A1 Hatfield



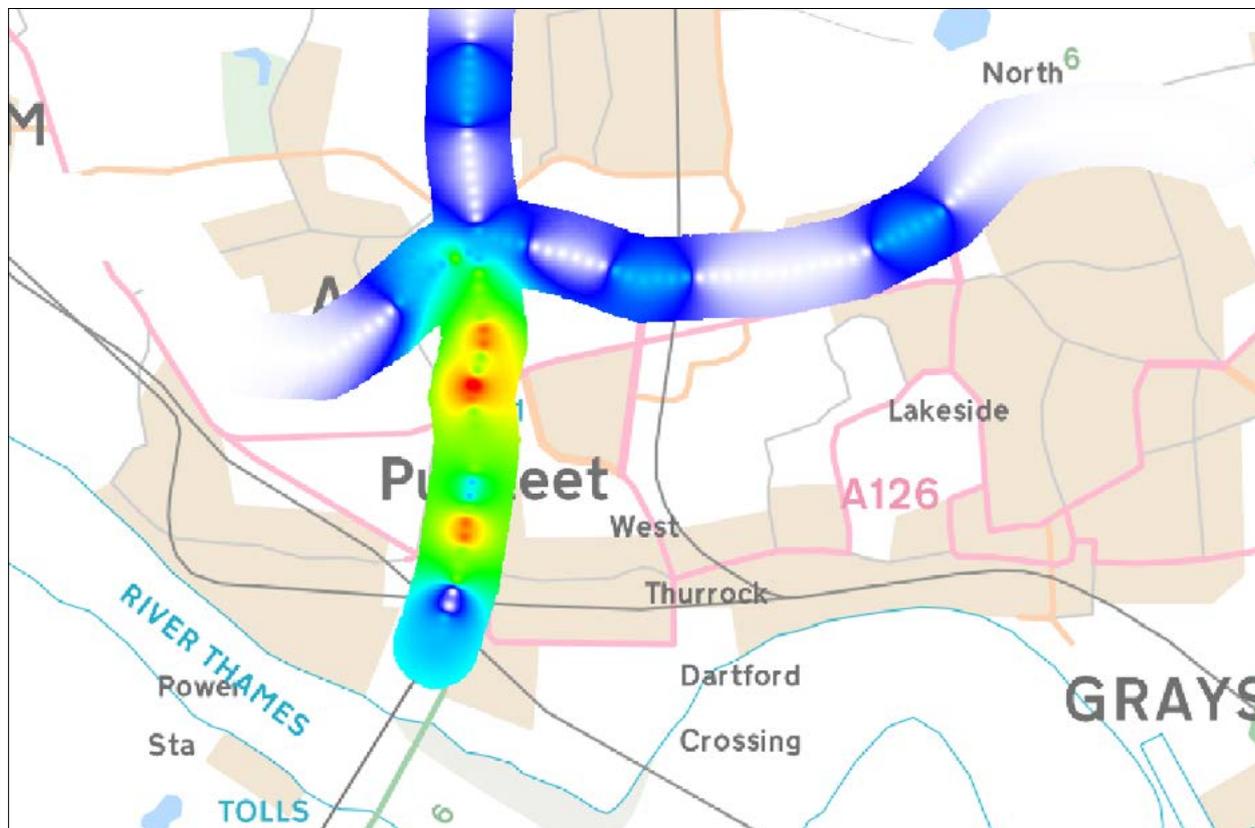
8 A127 east of M25



9 A127 Basildon



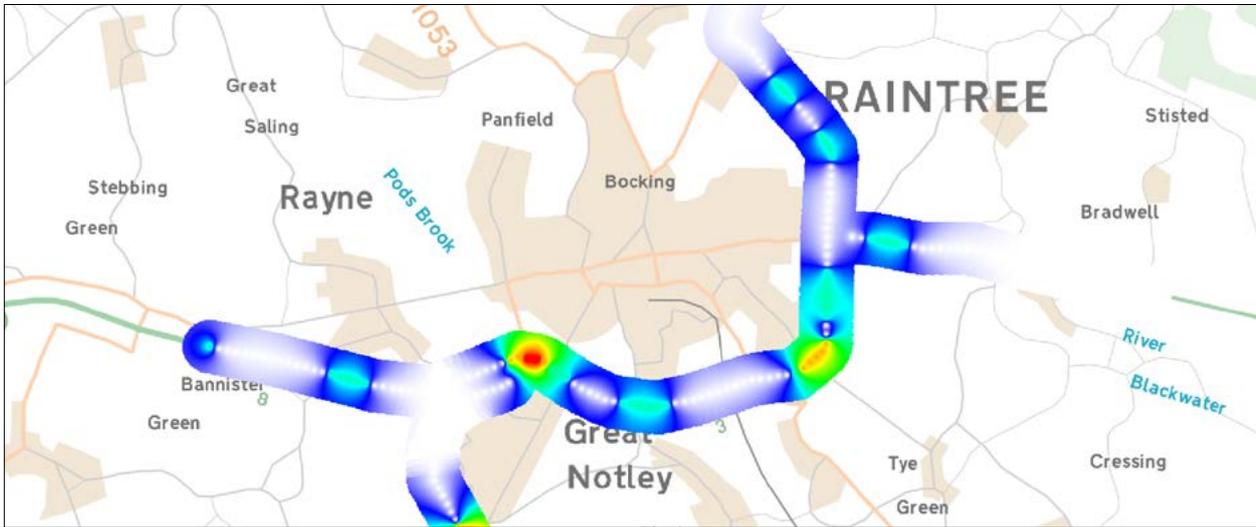
10 A13 and M25 DRC approach



11 A13 Stanford-le-Hope



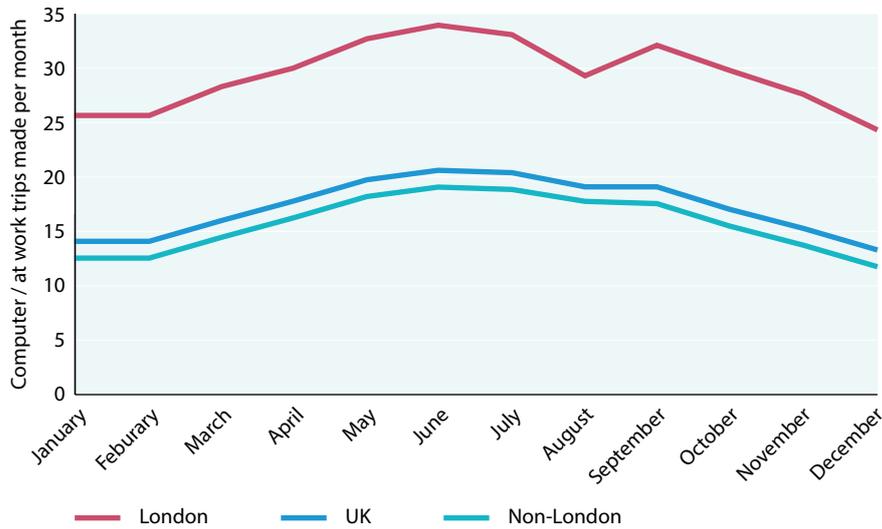
12 A120 Braintree



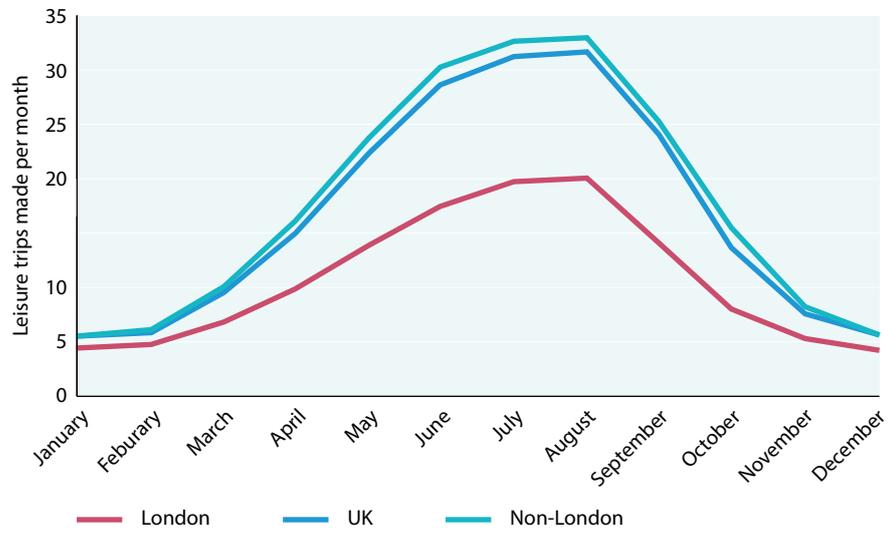
P2W rider seasonal trends

Both the graphs below show the seasonal nature of P2W traffic. These were taken from the document: **London Road Safety Unit Research Summary No. 4: Differences between London motorcyclists and those from the rest of the UK.** TfL January 2004. Accessed 8th November 2016 from <http://content.tfl.gov.uk/summary-no4-london-p2w-differences.pdf>.

Computer / at work trips



Leisure trips



Mosaic Group Summaries

A Well-off owners in rural locations enjoying the benefits of country life

A Country Living
 Well-off owners in rural locations enjoying the benefits of country life
 Ceredigion
 🏠 6.07% | 👤 6.49%



Key Features

- Rural locations
- Well-off homeowners
- Attractive detached homes
- Higher self-employment
- High car ownership
- High use of Internet

Who We Are

Age	66-70		Household income	£100k-£149k	
	12.3%	186	7.5%	248	
Household composition	Family		Number of children	No children	
	36.1%	146	76.8%	107	
Tenure	Owned		Property type	Named building	
	89.6%	139	40.1%	1031	

Channel Preference

14	48	98
114	70	108

Technology Adoption



Late Majority








ConsumerView
🏠 1.56M
👤 3.15M
📧 1.55M
@ 581k
Find out more

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D Thriving families who are busy bringing up children and following careers

D

Domestic Success

Elmbridge
🏠 6.86% | 📶 7.05%

Thriving families who are busy bringing up children and following careers

Key Features

- Families with children
- Upmarket suburban homes
- Owned with a mortgage
- 3 or 4 bedrooms
- High Internet use
- Own new technology

Who We Are

Age		Household income	
41-45		£70k-£99k	
22.6%	239	21.5%	332
Household composition		Number of children	
Family		2 children	
47.4%	191	24.0%	261
Tenure		Property type	
Owned		Detached	
92.6%	144	39.0%	219

Channel Preference

65	100	108
81	67	97

Technology Adoption

Early Majority

ConsumerView ? 🏠 1.84M 👤 3.90M 📄 1.73M @ 1.01M [Find out more](#)

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G Householders living in inexpensive homes in village communities

G

Rural Reality

Orkney Islands
🏠 5.87% | 📶 5.55%

Householders living in less expensive homes in village communities

Key Features

- Rural locations
- Village and outlying houses
- Agricultural employment
- Most are homeowners
- Affordable value homes
- Slow Internet speeds

Who We Are

Age		Household income	
46-50		£20k-£29k	
11.4%	123	24.3%	118
Household composition		Number of children	
Single		No children	
40.6%	107	75.7%	105
Tenure		Property type	
Owned		Semi-detached	
69.0%	107	32.6%	123

Channel Preference

50	66	99
98	93	109

Technology Adoption

Early Majority

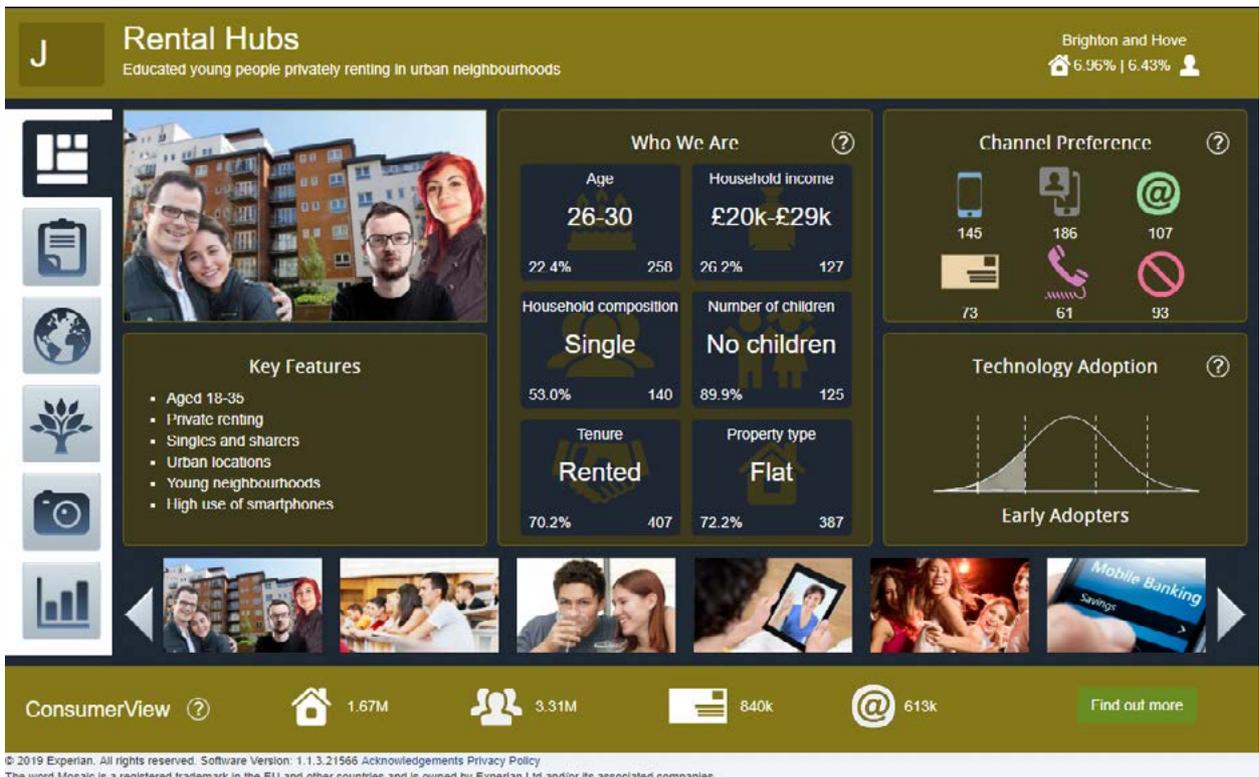
ConsumerView ? 🏠 1.64M 👤 3.11M 📄 1.52M @ 762k [Find out more](#)

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H Younger households settling down in housing priced within their means



J Educated young people privately renting in urban neighbourhoods



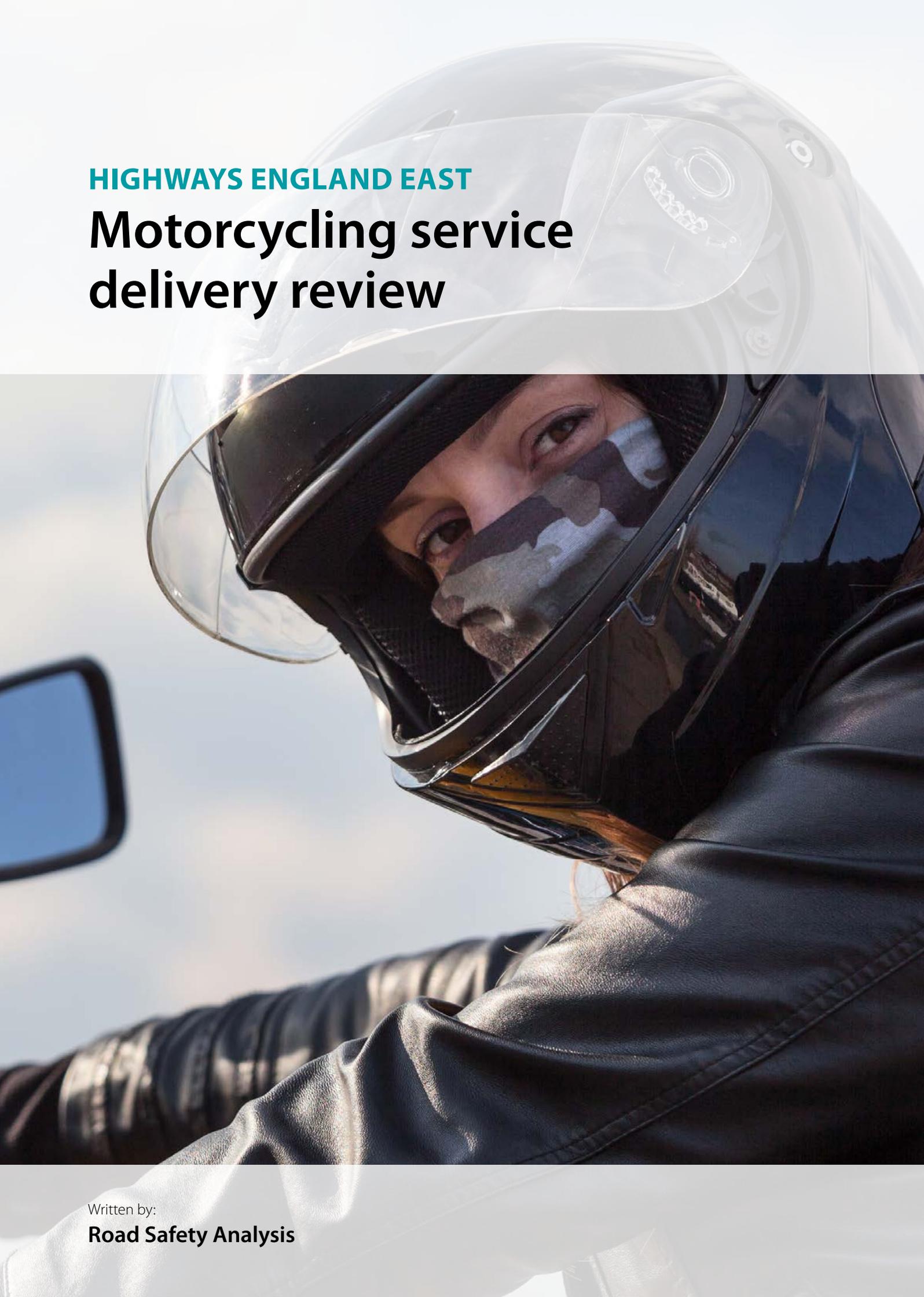
M Families with limited resources who have to budget to make ends meet



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Mosaic summary for profiled rider groups

Mosaic group	Description	% of commuters	& of leisure riders	% of young riders
A	Well-off owners in rural locations enjoying the benefits of country life	8.1%	8.1%	6.5%
B	Established families in large detached homes living upmarket lifestyles	5.6%	6.1%	5.9%
C	Thriving families who are busy bringing up children and following careers	10.1%	11.6%	7.5%
D	Thriving families who are busy bringing up children and following careers	10.1%	11.6%	7.5%
E	Mature suburban owners living settled lives in mid-range housing	6.7%	9.0%	7.2%
F	Elderly people with assets who are enjoying a comfortable retirement	6.6%	7.1%	3.8%
G	Householders living in inexpensive homes in village communities	11.9%	12.9%	17.8%
H	Younger households settling down in housing priced within their means	12.5%	11.6%	12.9%
I	Residents of settled urban communities with a strong sense of identity	2.9%	2.3%	3.1%
J	Educated young people privately renting in urban neighbourhoods	6.9%	3.5%	5.4%
K	Mature homeowners of value homes enjoying stable lifestyles	4.6%	3.5%	2.8%
L	Single people privately renting low cost homes for the short term	5.8%	7.4%	4.7%
M	Families with limited resources who have to budget to make ends meet	10.2%	10.0%	15.8%
N	Elderly people reliant on support to meet financial or practical needs	3.7%	2.3%	3.4%
O	Urban renters of social housing facing an array of challenges	3.0%	2.9%	2.9%



HIGHWAYS ENGLAND EAST

Motorcycling service delivery review

Written by:

Road Safety Analysis

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Introduction

Highways England East works closely with road safety professionals delivering interventions across the East region. Whilst not delivering interventions ‘on the ground’, Highways England East supports the partnership activities and wants to ensure that the most effective interventions are delivered, for the benefit of the whole region.

As such, Road Safety Analysis (RSA) were commissioned to undertake a review of road safety interventions delivered in the East of England which are specifically aimed at reducing motorcycle casualties. The purposes of the review are:

- to ensure that the types of motorcyclists most at risk are included in the target audiences of the interventions delivered;
- to ascertain whether the interventions are evaluated; and
- to identify gaps and duplications.

Methodology

The Service Delivery Review process involved consulting with road safety professionals across the East region, to obtain in-depth insight into the motorcycle interventions being delivered. To this end a questionnaire was developed, as shown in Appendix A – Questionnaire on page 49.

The questionnaire was sent out to road safety partnerships and main delivery partners across the region, and recipients were encouraged to share the questionnaire with local colleagues and partner organisations.

The questionnaire was comprised of a set of mainly open questions, to be completed for each intervention. The questions were designed to build up a picture of each intervention in terms of who the delivery partners are; funding provisions; frequency of delivery and when it started; details of the target audience and behaviours, and how these were identified; and whether the intervention has been evaluated.

The submissions were collated and summarised, starting with mapping the interventions against target groups identified by Will Cubbin in ‘Powered-2-Wheelers in the Eastern Region’. Motorcyclists are far from homogeneous and the collisions in which they are involved also differ. Whilst there are similarities in motorcycle collisions across the East region, there are also key differences and each individual area has its own target audiences. These are presented in full in the section on Motorcycle Target Groups. Each intervention’s description was compared to the target groups identified by collision analysis to determine if the targets were consistent with collision issues in the area.

The syntheses of each intervention also included identifying the focus of the activity, such as skills training, awareness raising, changing attitudes or imparting advice. A key component was assessing whether the intervention had been evaluated and what the evaluation results recommended. A graphical synopsis of the interventions delivered in the East of England is shown in the section on Summary of Interventions.

A key part of the process was to identify opportunities for cross-regional collaboration, where similar interventions are being delivered. These opportunities could realise economies of scale, consistency of messaging and reduce duplication. Additionally, a gap analysis was conducted to ensure that there were not key target groups or focuses that were omitted from an area’s interventions.

The process culminated in rating the interventions on a scale of ‘best practice’, based on a combination of evaluation results; targeting appropriate audiences; and supporting information. The ratings are a product of the author’s judgement, her knowledge of effective road safety interventions and

evaluation techniques, and the information provided. The rating scale begins with ‘no evidence of best practice’ (which does not mean that the intervention is not effective or worthwhile, but does reflect that there was no evidence supplied to demonstrate its efficacy); ‘worth considering but more evidence required’ (where interventions have a strong evidence base and/or evaluation, but where more researched could enhance evidence of efficacy); and ‘best practice based on evidence’ (where the evaluation results and evidence base provided suggest the intervention is worth pursuing).

Responses

There were 39 interventions submitted from across the region, from the following areas:

- Bedfordshire – 8
- Cambridgeshire – 4
- Essex - 10
- Hertfordshire – 3
- Norfolk - 6
- Suffolk – 8

Figure 1 *Types of intervention submitted*

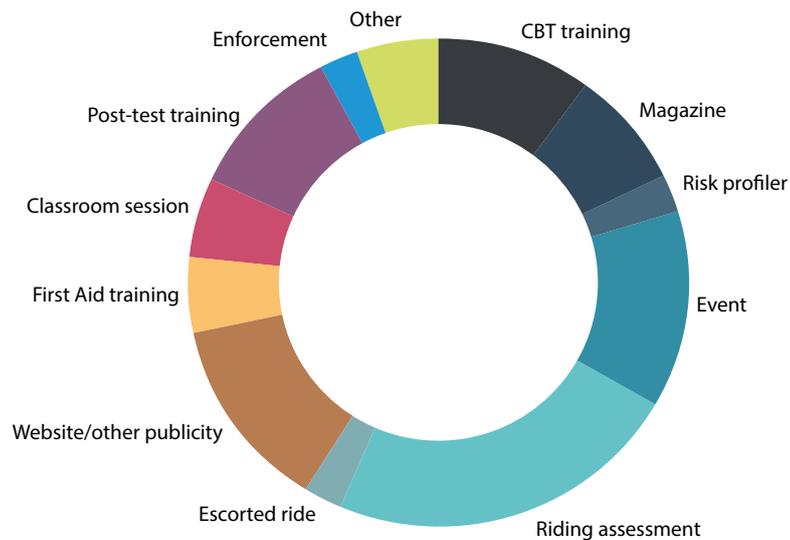
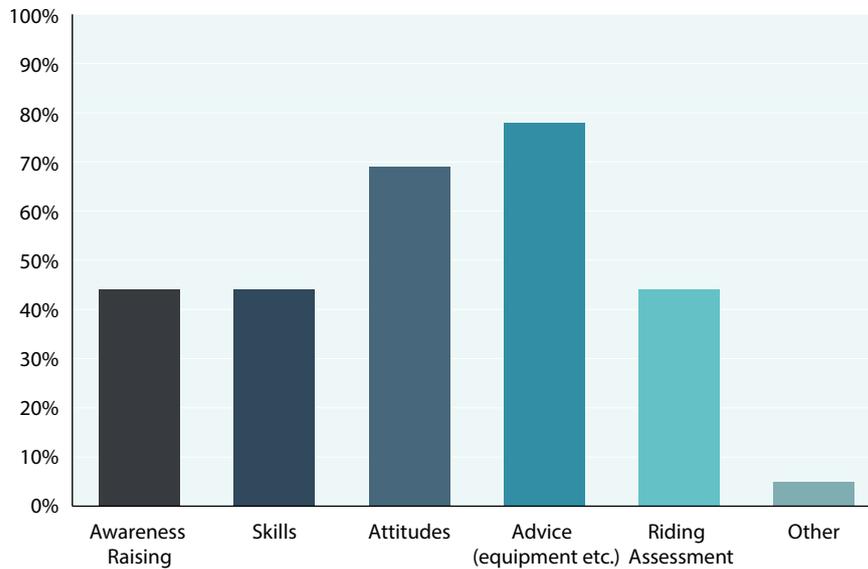


Figure 1 shows the types of intervention submitted, with a quarter described as ‘riding assessments’ and 10% ‘CBT training’. In total, 13% of the interventions could be described as ‘events’ and a further 13% as ‘website/other publicity’.

The interventions were also categorised according to focus, shown in Figure 2. Each intervention could have multiple focuses. It shows that almost all of the interventions involved some sort of ‘advice giving’, whilst 70% were targeting ‘attitudes’.

Figure 2 The focuses of the interventions



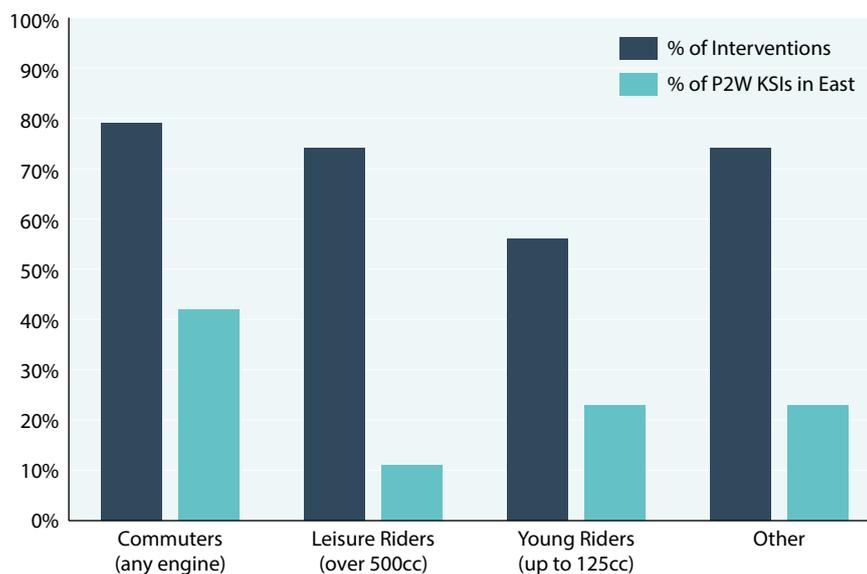
The target groups recommended by the collision analysis are explored in the next section. They can be summarised into four main groups:

- Commuters (any engine size)
- Leisure riders (over 500cc)
- Young riders (up to 125cc)
- Other riders

Figure 3 shows that many of the interventions target more than one type of motorcyclist. Nearly 80% were trying to communicate, and reduce the risk, of commuter riders, with three-quarters aimed at leisure riders on large motorcycles. A similar percentage target 'other' types of riders – this was selected when an intervention was described as targeting all types of motorcyclist or when an audience was identified that did not fit the profile of the other three (for example, riders of up to 125cc motorcyclists of any age, not just young). Whilst the smallest target group was young riders, 56% of the interventions still targeted this segment. The chart also shows the percentages of riders in killed or serious collisions (KSI) for each rider group. It shows that the largest casualty group is 'commuters' and this was also the group for which the highest percentage of interventions were targeting. The next largest group for intervention targeting was 'leisure riders': however, this group only represented 11% of riders involved in KSI collisions in the East.

The other conclusion from this analysis is that interventions tend to target multiple groups. There are pros and cons of these interventions targeting more than one audience type. On one hand, these interventions are obviously trying to get the messages to as wide a target audience as possible, all of which are over-represented in the casualty statistics. On the other hand, there is a danger that the interventions have too broad a focus by trying to appeal to multiple target audiences and there could be an argument for refining and adopting some of them to narrow that focus and ensure that the specific target audience is engaged with.

Figure 3 The target groups for the interventions



Motorcycle Target Groups

A major piece of analysis was undertaken by Will Cubbin, Road Safety Analyst for the Safer Essex Roads Partnership, on behalf of Highways England¹. The purpose of the analysis was to provide an insight into fatal and serious injury collisions involving powered two-wheelers (P2W) in the Eastern Region. The analysis uses the most recently reported injury data, as recorded in STATS19 (2011-2015), to profile geographical hotspots, road types and routes as well as temporal trends of times of day and seasons. Junction analysis and manoeuvres and contributory factors of other participants were also analysed. The types of riders involved in the collisions were also profiled for each police force area, focusing on home address locations, distance from home (and thus the potential for cross border activity), demographic characteristics and motorcycle type.

The report should be used alongside this Review to ensure that the right messages are being delivered, to the right target audience in the right places.

The demographic analysis suggested three rider profile groups should be created, based on age, engine size and type of collision:

- Young Riders – Aged 16 to 25 years on motorcycles with engines up to 125cc (23% of riders involved in KSI collisions)
- Commuters – Aged 26 to 65 years on motorcycles of any engine size in weekday collisions (42% of all riders involved in KSI collisions)
- Leisure Riders – Aged 26 to 55 years on motorcycles with engines over 500cc (11% of all riders involved in KSI collisions).

The rider profile groups differ across the East region, with some profiles featuring more highly in collisions in some areas than others. This means that the casualty reduction priorities are not the same across the East and therefore the interventions delivered should reflect this.

¹ Cubbin, W., *Powered-2-Wheelers in the Eastern Region: Version 2.2*, (Safer Essex Roads Partnership, February 2017)

Figure 4 shows that ‘commuter riders’ account for over 35% of all riders involved in collisions in all regional police forces apart from Norfolk and Suffolk. Bedfordshire, Norfolk and Suffolk had over 35% of riders crashing on their roads from the ‘young rider’ category, with Norfolk and Suffolk having the highest percentages of ‘leisure riders’ in injury collisions (9% and 8% respectively and 15% and 13% in KSI collisions). Approximately 20% of riders involved in injury collisions in the East do not fit the three rider groups, with 22% of those in injury collisions in Essex not fitting any profile.

Figure 4 Rider Profile Breakdowns by Police Force Area – All Severities (2011-2015)

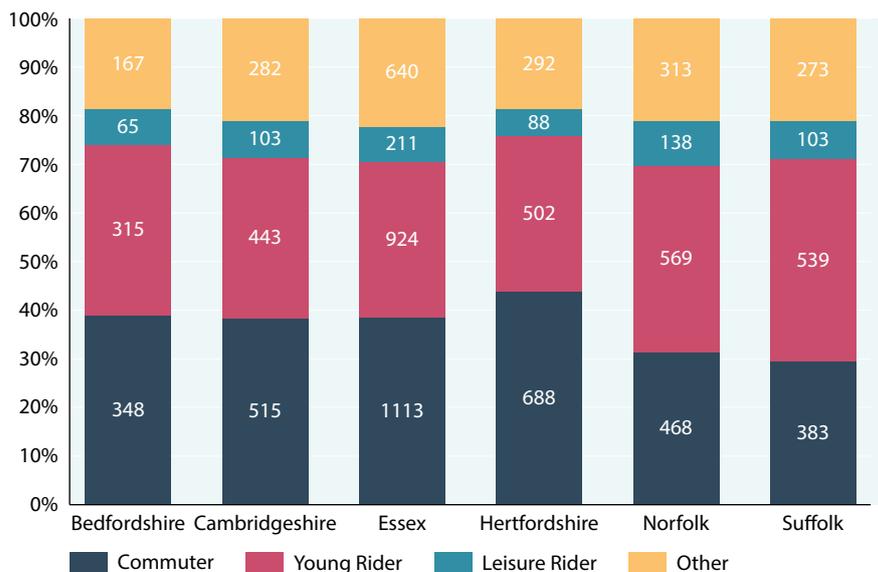
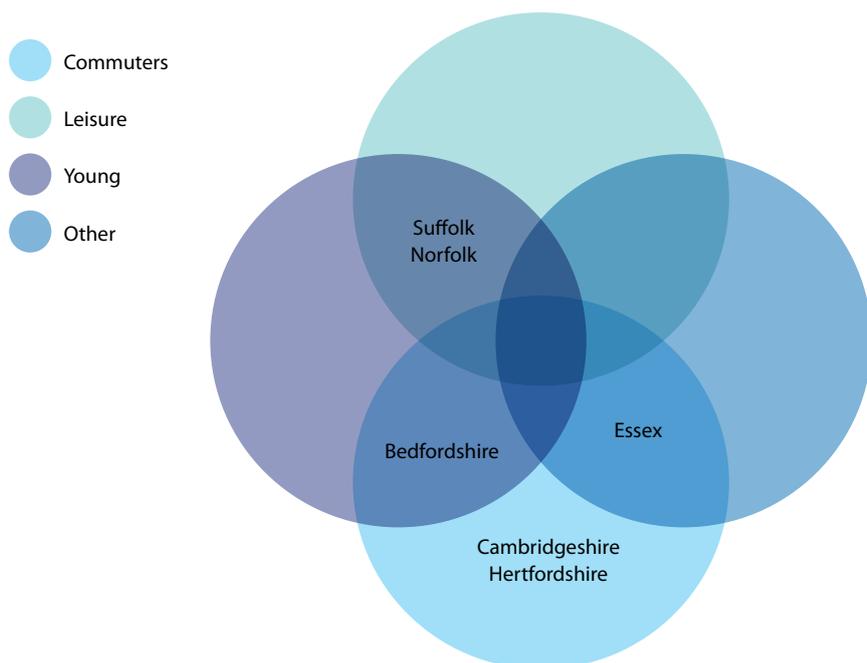


Figure 5 shows the target groups of each of the police force areas and shows how different areas have different priority areas, although there are some similarities and overlaps.

Figure 5 Target Casualty Groups by Police Force Area



Summaries of Rider Profile Groups

Commuter Riders

“Riders in this group are concentrated at the younger end of the 26-65 age group, but with a secondary peak age in their mid to late forties. They tend to have collisions on urban roads during afternoon commuting times, with a smaller morning peak, an average of about 10 miles from where they live. These riders tend to live in areas of lower than average incomes. Almost 12% live in Mosaic Type G areas (village communities) some of which may be underserved by affordable public transport alternatives.”²

Leisure Riders

“Riders in this group are most likely to be aged in their mid-forties to early fifties. They tend to have collisions on rural roads during afternoons at the weekend, particularly Sundays. Consequently, their collision locations are fairly dispersed, resulting in fewer areas suitable for on-the-road interventions. They appear to ride further than the commuter group, average 16 miles from home to collision location. Although over represented in areas of lower than average incomes, they are on average more affluent than other P2W rider groups.”³

Young Riders

“Mosaic, deprivation and age distribution data suggests many individuals in the ‘Young Riders’ group may be influenced by financial or transport availability related factors, more than a specific desire to ride a motorcycle.

The fact that the vast majority of collisions occur on urban roads throughout the week and weekend, combined with the average distance from home to collision of 3.6 miles, indicates Young Riders do not usually travel long distances.

A combination of inexperience, low quality CBT training, and greater numbers on the road may be a reason for the greater number of riders at the younger end of this age group being involved in KSI collisions. As riders reach their early to mid-20s, they may avoid collisions due to experience and maturity, and be fewer in number as other options such as car ownership become viable.

Comparison of young drivers with young P2W riders suggests that some young P2W engagement could ‘piggy back’ on more general young driver initiatives, but it is important to include specific engagement for young P2W riders to address the issues most pertinent to this group.”⁴

Movement across the region⁵

In addition to understanding who to target in terms of rider type, it is important to know where the target audience could be found. The collision analysis compared the percentages of ‘local’ riders (those involved in a collision in the same local authority district or unitary authority as they live) with the percentage of riders crashing in an area who live elsewhere (the ‘Import rate’) and the percentage of riders living in a district or unitary who crash elsewhere (the ‘Export rate’).

Local Riders

In Ipswich and Southend-on Sea, there are *low* import and export rates and *high* rider involvement rates per head of local population. In these areas, it makes sense to target local resident P2W riders.

² *Ibid.*, p.46

³ *Ibid.*, p.49

⁴ *Ibid.*, p.54

⁵ *Ibid.*, p.24

Table 1 Authorities with high proportions of local riders

District	Import Rate	Export Rate	KSI rate per 10k population – Locally	KSI rate per 10k population – Region Average
Ipswich	29%	37%	5.11	4.96
North Norfolk	32%	32%	3.69	
Peterborough	29%	13%	4.52	
Southend-on Sea	39%	27%	5.23	
Waveney	19%	27%	4.92	

Non-Local Riders

Epping Forest, Hertsmere and Three Rivers are all areas where there are *high* import and *low* export rates and *high* rider involvement rates per head of local population. In these areas, it makes sense to target riders on the roads and collaborate with other authorities in the area to communicate with their residents.

Table 2 Authorities with high proportions of non-local riders

District	Import Rate	Export Rate	KSI rate per 10k population – Locally	KSI rate per 10k population – Region Average
Brentwood	60%	39%	4.63	4.96
Broxbourne	57%	20%	2.92	
Epping Forest	73%	34%	7.77	
Hertsmere	62%	23%	5.08	
Three Rivers	67%	43%	5.42	

Areas with a *low* rider involvement rate per head of local population and a *low* import rate but high export rate, will have low numbers of casualties on local roads. However, their residents are still involved in collisions as P2W riders but elsewhere in the East region. Castle Point, Great Yarmouth and Luton could all collaborate with neighbouring areas to communicate with their residents and reduce their risk elsewhere on the region's roads.

Table 3 Authorities who export riders to other areas

District	Import Rate	Export Rate	KSI rate per 10k population – Locally	KSI rate per 10k population – Region Average
Castle Point	39%	58%	3.49	4.96
Harlow	47%	52%	3.55	
Broadland	45%	49%	5.16	
Great Yarmouth	38%	46%	3.46	
Luton	34%	41%	2.65	

Summary of Interventions

Figure 6 shows a summary of the interventions provided as part of the syntheses. Each intervention is defined by the area it is delivered in; which KSI targets the intervention seeks to engage with (denoted by the coloured circles); which KSI targets are the priority groups for that area (shown as green shaded areas); what the focus of the interventions are (indicated by blue circles); whether the intervention has been evaluated; and a rating out of five, as assigned by the author, where a rating of 1 corresponds to 'no evidence of best practice' and 5 to 'best practice based on evidence' (determined as per the methodology described above).

Each intervention is described in full, including evaluation results where available, in the section on Descriptions of Interventions. The descriptions provide an insight into the ratings which have been applied. Links to each full description are accessible through the table. The section on 'Interventions Worth Considering' on page 37 gives some guidance on how additional information could be obtained to improve the evidence (and thus the ratings) for these schemes. Furthermore, the opportunities afforded by these interventions and improving their evidence base are discussed

A further section on the groups of interventions in each level of rating is shown on page 36 in Best Practice Findings.

Figure 6 - Summary of Interventions

Area	Intervention	KSI Target				Focus						Evaluated	Rating
		Commuter	Leisure	Young	Other	Awareness Raising	Skills	Attitudes	Advice	Riding Assessment	Other		
Bedfordshire	MTM 1st Ride Pre-CBT			●	●		●	●	●	●		✓	3
	MTM Bedfordshire Biker Magazine	●	●	●	●	●		●	●			✓	3
	MTM Biker Risk Profiler	●	●	●	●			●				✓	3
	MTM Ride Free open day	●	●	●	●	●			●			✓	3
	MTM Ride Safe	●	●		●			●	●	●		✓	3
	MTM Take Control post CBT			●							●	✓	3
	MTM Winter Skills day	●	●	●	●	●			●			✓	1
	Enhanced Rider Scheme	●	●		●		●	●	●	●		✓	3
Cambridgeshire	BikeSafe	●	●		●		●	●	●	●		✓	4
	Motorcycle shows	●	●	●	●	●		●				✗	1
	Ride to work day	●				●		●				✗	1
	TWIST	●	●	●		●		●				✓	3

Area	Intervention	KSI Target				Focus						Evaluated	Rating
		Commuter	Leisure	Young	Other	Awareness Raising	Skills	Attitudes	Advice	Riding Assessment	Other		
Hertfordshire	Biker Down	●	●				●	●	●			✓	3
	Rider Magazine	●	●	●	●	●		●	●			✗	1
	BikeSafe	●	●		●		●	●	●	●		✓	4
Suffolk	Progress Motorcycling	●	●		●			●	●	●		✗	1
	Young Apprentice Scheme			●		●			●			✗	3
	Fire Bike/Biker Down	●	●		●		●	●	●			✗	3
	Suffolk Hugger	●	●	●	●	●		●	●			✓	3
	College open event			●				●	●			✗	1
	Rider Plus/Young Rider	●	●	●	●		●	●	●	●		✓	2
	Safe Rider	●	●		●		●	●	●	●		✓	3
	Wheels to Work	●		●			●	●	●			✓	3
Norfolk	Safe Rider	●	●		●		●	●	●	●		✓	3
	Pedsafe			●				●	●			✗	2
	Norfolk & Suffolk Biker Magazine	●	●		●	●		●	●			✓	3
	i2i Motorcycle Academy	●	●	●	●			●	●			✓	4
	Norfolk & Suffolk Casualty Reduction motorcycle team	●	●	●	●	●			●		●	✗	3
	Hugger's Challenge	●	●	●	●		●	●	●	●		✓	5

Area	Intervention	KSI Target				Focus						Evaluated	Rating
		Commuter	Leisure	Young	Other	Awareness Raising	Skills	Attitudes	Advice	Riding Assessment	Other		
Essex	Firebike	●	●	●	●	●		●	●			✓	3
	Firebike Better Biking Courses	●	●		●		●	●	●	●		✓	3
	Firebike Advanced Machine Skills Courses	●	●	●	●		●	●	●	●		✓	3
	BikeSafe	●	●		●		●	●	●	●		✓	4
	Hugger Advanced Instructor Training Days	●	●		●		●		●	●		✗	2
	Essex Hugger Challenge	●	●		●	●						✓	3
	Essex Hugger Campaign – Other Road Users				●	●						✗	2
	Motorcycle pitstop events	●	●		●							✓	3
	Young moped/Scooter Rider education days			●		●		●	●			✓	3
	Street Spirit Moped/ Scooter Safety campaign			●		●	●	●	●	●		✗	3

Descriptions of Interventions

MTM 1st Ride Pre-CBT (Bedfordshire)

1st Ride was originally designed as a pre-CBT intervention. The concept was to target those just prior to and at the point of taking a CBT. The original assumption was that the audience would be younger riders, accessed through schools and colleges. However, it became apparent that older new riders were using mopeds for commuting and so the attendance age range was broadened.

It proved challenging to recruit participants to the original format of the intervention and discussions with local trainers suggested that a shift to post-CBT training would be most useful, as the audience was already captive, having chosen to do CBT. The adapted version was conceived as a response to concerns that elements of CBT, even if delivered to DSA standards, were not necessarily given adequate time allocation, notably practical time and experience of on-road riding. The intervention made use of the appeal of more bike time to provide additional theory and guidance and insights into attitude and behaviour, making use of group scenarios.

1st Ride was first delivered in 2008 and continued until 2010, until funding became an issue. Trainers gradually disengaged as it was seen as a resource-intensive non-essential extra to the CBT.

The intervention was evaluated as part of a full evaluation of Motorcycle Training Matters⁶ by Dr Julie Gandolfi in March 2010. Questionnaires and interviews were used to assess the effectiveness of 1st

⁶ Gandolfi, J., *Evaluation of the Bedfordshire and Luton Casualty Reduction Partnership Motorcycle Training Matters Project 2008-2010*, (Driving Research Ltd., 2010)

Ride. Significant confidence increases were observed in the questionnaire responses before and after 1st Ride. Whilst increased confidence was linked to an increase in risky attitudes and behavioural intention in young novice riders, these measures were safer at the end of the intervention than at the beginning (although attitudes to 'close following' deteriorated). The perception of the level of risk faced by participants as a motorcyclist also increased. These findings suggest that messages related to risk perception and risky attitudes and riding behaviours were absorbed by the participants. It would be interesting to see the results of a comparison group of those who had just taken CBT to see the additional benefit of 1st Ride.

Assessment: *Worth considering but more evidence required*

MTM Bedfordshire Biker Magazine (Bedfordshire)

Bedfordshire Biker was a magazine which was distributed as a hard copy to motorcyclists, using a variety of different motorcycle outlets and at events which were organised and run by the local road safety partnership. The magazine was also offered in batches to dealers and training bodies, who could make use of it as a giveaway. An online version of the magazine was free to subscribers via the <http://www.motorcyclingmatters.org> website.

Bedfordshire Biker was designed to appeal to the widest possible riding audience, with articles relevant to the full range of the training continuum rider experience. It was principally used to raise awareness of local motorcycle activity and to provide an update on local developments in highway maintenance.

The magazine started in 2010 and five editions were produced before funding cuts prevented further support for the free publication. It is no longer delivered.

Bedfordshire Biker was evaluated in a review of Central Bedfordshire's education training and publicity programme in 2012⁷. An online survey of a very small self-selected sample of participants (10) were asked a set of questions about the magazine. Whilst the feedback suggested that the content was valued by these readers and that some of them would be prepared to pay a small charge for the magazine, it is difficult to draw strong conclusions on the value of the magazine from this study.

Assessment: *Worth considering but more evidence required*

MTM Biker Risk Profiler (Bedfordshire)

The Biker Risk Profiler (BRP) was a tool devised to assist training providers to establish a rapport with trainees through their own self-awareness and knowledge of trainees' attitudes to risk to enable more effective coaching relationships and training outcomes.

The Biker Risk Profiler was developed by Driving Research Limited as there was no attitudinal or behavioural measure of rider risk available. It was administered and refined during 2009, 2010 and 2011 as part of the grant funding for Motorcycle Training Matters and subsequently the Enhanced Rider Scheme. The tool provided an opportunity for both trainer and trainee to develop self-awareness and to explore where attitude and resultant behaviour modifications might yield more successful riding outcomes.

A suitable framework was statistically established and additional items were created from interviews with riders. The pilot version of the Biker Risk Profiler created 5 behavioural factors – Safety-Oriented Behaviour, Riding Concerns, Thrill Seeking, Interaction with Other Road Users, and Fatigue Proneness. It also created 4 coping factors – Confrontational Coping, Task Focus Coping, Avoidance Coping and Anxious Coping, and one Socially Desirable Responding factor to measure the extent to which a participant may be under-representing their risk.

⁷ Roberts, P., McMurray, I., Horan, L., Simmons, J. and Bell, R., *Road Safety Education, Training and Publicity: an Evaluation of Central Bedfordshire's 2011/2012 Programme: Motorcyclists*, (University of Bedfordshire, 2012)

The evaluation⁸ found that the Biker Risk Profiler has the ability to differentiate between sub-groups of riders, categorised on the basis of situational variables, and therefore it is a valid instrument. It was recommended that more detailed validity analysis is carried out using a larger sample of participants.

Assessment: Worth considering but more evidence required

MTM Ride Free open day (Bedfordshire)

Ride Free open day events were a means to showcase all things motorcycling related locally and to actively promote and refer riders along 'The Training Continuum' in the direction of their next training step should they wish to find out more.

The events were based on comprehensive partner involvement with engagement from all key stakeholders within the training continuum. The objectives of the event were promotion of rider training opportunities; encouragement of safe riding practices; and increasing awareness of Motorcycling Matters/Motorcycling Training Matters. The events were held annually until 2014, when reduced funding and partner staffing changes made it difficult to continue to justify the intervention.

The audience were generally self-selecting and tended to be older, experienced riders. An evaluation of the Ride Free event in 2014 found that "whilst elements of the event did promote rider training opportunities and encourage safer riding practices, the conclusion is that Ride Free 2014 did not actively do this among visitors who did not consciously seek out the corresponding attractions. However, the event was effective at increasing awareness of Motorcycling Matters/Motorcycle Training Matters."⁹

Assessment: Worth considering but more evidence required

MTM Ride Safe (Bedfordshire)

RideSafe was designed after National BikeSafe had been criticised by Approved Training Bodies for stepping into the realm of training. Therefore, RideSafe is a 'referral only' mechanism to post-test and advanced training opportunities locally.

RideSafe is led by Bedfordshire Police and involves providing existing riders/full licence holders with the opportunity of a police-assessed ride, free of charge. The Motorcycle Training Matters project arranges for a group of police motorcyclists to be available on a Sunday morning approximately once a month. The Police-devised routes incorporate town, country and open roads and rides last for 30 to 45 minutes. On their return, riders are de-briefed by their assessor and provided with feedback documentation to assist them in developing their riding skills. RideSafe was first delivered in 2009 and has been delivered every month in the biking season annually since.

RideSafe provides assessment only and no training is involved so it is not reasonable to expect a measurable attitudinal or behavioural change to occur because of the intervention. This meant that no quantitative research was included in the evaluation. Interviews¹⁰ with RideSafe participants provided an insight into the reasons why they undertook the assessment and how satisfied they were with the experience. However, it is difficult to assess whether the intervention led to greater levels of post-test training being undertaken.

Assessment: Worth considering but more evidence required

MTM Take Control post CBT (Bedfordshire)

The Take Control intervention was a natural post-CBT evolution of the 1st Ride pre-CBT scheme. Casualty data analysis identified some primary riding behaviours which were more frequently present in collisions involving younger, inexperienced 16 to 20-year-old (mostly male) riders. These riders

⁸ Gandolfi, (2010)

⁹ Gandolfi, J., *Ride Free 2014 Event Evaluation*, (Driving Research Ltd., 2014)

¹⁰ Gandolfi, (2010)

seemed to have more difficulty assessing how road situations might change which created hazards during manoeuvres, including close following or filtering. It was also felt that attitudes to speeding and towards clothing and safety equipment requirements needed to be addressed.

Take Control was designed to target new riders, aged 16 to 20 years old who had recently passed CBT. An independent Approved Training Body (ATB) (90-One Rider Education) trained interested local ATBs and then offered a quality assurance input to ensure delivery remained consistent with the design. The intervention was only delivered in 2011, where feedback from trainers was mixed, which impacted on the consistency of the delivery.

A pre-and post-evaluation¹¹ was conducted on the day of training to examine the demographic characteristics of the riders in terms of their riding experience, intentions and susceptibility to risky riding behaviour. It also aimed to assess the effectiveness of the training designed to enhance young riders' confidence and riding skills, knowledge, attitudes and behaviours. The evaluation comprised of a small sample size of 20 participants and there was no long-term effectiveness measured, which limits the usefulness of the results. However, improvements in riders' perceived risks and confidence post-training were observed.

Assessment: Worth considering but more evidence required

MTM Winter Skills day (Bedfordshire)

The Winter Skills Day was an event considered to be a useful focused sub-Ride Free event, which was well received and attended and provided further opportunities to promote post-test training, notably the Enhanced Rider Scheme. This focused event was primarily led by post-test training partners.

The event was delivered in 2011 and 2012 with an aim to raise awareness to motorcyclists of a range of issues related to winter riding skills. However, it could not be sustained financially. The skills were particularly focused on the demands and considerations which are useful for winter riding. The interventions were focused on enabling riders to have greater confidence in their understanding of their machines' and their own capabilities. Defensive riding strategies were particularly relevant.

An evaluation of the event¹² examined the activities which participants attended; the usefulness of the event; and whether knowledge, understanding and confidence of winter riding skills had improved as a result of attending the event. A survey was conducted at the event, of a small sample of participants (16). However, the survey was only conducted after the event, so it was not possible to determine if change had occurred, beyond changes that respondents reported themselves immediately after the event. It is therefore very difficult to assess the usefulness of these days.

Assessment: No evidence of best practice

Pan-Regional Enhanced Rider Scheme (Bedfordshire)

The Pan-Regional project was a Department for Transport grant funded scheme which was divided into several work streams, including an analysis of the marketing of the Enhanced Rider Scheme (ERS) by Warwickshire /West Mercia team; trainer capacity analysis by Devon and Cornwall; and an evaluation of ERS by the East of England team.

The evaluation project was in two phases – the first was establish if there were measurable benefits being delivered to ERS users; were the benefits consistent and enduring over time; which types of user gained the most benefit and what approaches could be used to maximise effectiveness of ERS nationally. Phase two developed the questionnaires used in phase one and aimed to further understand the types of riders taking part in ERS and their reasons for doing so, their experiences of the scheme and attitudinal and behavioural change brought about from participating in the scheme.

¹¹ Roberts et al, (2012)

¹² Roberts et al, (2012)

Phase one¹³ was designed to include quantitative and qualitative approaches, however, there were issues with participant access and only a small sample emerged. There were also some key assumptions made at the research proposal stage about the role of the DSA in the project and that ERS was delivered using a standardised framework. Unfortunately, these assumptions were all proven to be incorrect, leading to some changes in research approach, focusing mainly on the qualitative feedback. Phase one found that take-up was low and that ERS was not promoted widely enough. Trainers and trainees both felt that incentives were required to encourage participation.

Phase two¹⁴ involved collecting data from 18 riders during 2011 and therefore represents a small sample size. Of these 18 participants, eight had previously completed a post-test assessment or training. The questionnaire collected demographic information; a short-adapted version of the Biker Risk Profiler (collecting key attitudinal and behavioural tendencies); and a section on the expectations and experiences of ERS. Despite the small sample size, the research found results that were indicative of an increase in rider self-esteem, confidence and positive self-evaluation. Participants reported improved hazard perception, dealing with traffic and dealing with stressful riding conditions.

Assessment: Worth considering but more evidence required.

BikeSafe (Cambridgeshire)

BikeSafe is a national scheme that has been delivered in Cambridgeshire by Cambridgeshire Police, Cambridgeshire IAM and Cambridgeshire Advanced Drivers and Riders (CADAR) annually since 2002. The motorcycle safety workshops and assessed rides are delivered across five hours in one day. There are five workshops per year between May and September in Cambridgeshire.

BikeSafe seeks to bridge the gap to post-test training. The target audience are across the spectrum of rider types and are self-selecting, with the target behaviours of thrill-seeking, bends, overtaking, filtering, attitudes to riding and group riding all addressed by BikeSafe.

A large scale national evaluation of BikeSafe¹⁵ was conducted in 2016. It involved a pre-questionnaire delivered before workshop attendance and a post-questionnaire completed 12 months after workshop attendance. There were 530 respondents who participated in both stages of the evaluation and were included in the analysis. The principal aim of BikeSafe is to encourage the take-up of post-test training and nationally, a specific objective of at least 20% of respondents undergoing accredited training with a year of attendance was set. This objective was met by national BikeSafe, with 26% of attendees reporting undergoing training in the 12 months after their workshop. Furthermore, analysis of those who progressed to post-test training found an encouragingly diverse cohort of new riders, including Riding Hobbyists (defined in research by Christmas et al¹⁶ as risk adverse and unlikely to have undertaken training) and Look-at-me Enthusiasts (defined as young riders who tend to exhibit high levels of confidence and engage in risky riding behaviours). Positive shifts in attitudes were also observed, suggesting a heightened awareness of the importance of defensive riding and higher reported usage of reflective and high visibility riding gear. There was some evidence of positive behavioural change found, including in speed-related behaviours, however, there were no significant changes in hazard perception or reported collision involvement rates. Two undesirable changes in rider hostility were also observed.

It should be remembered that BikeSafe is not a training tool and is instead a mechanism for referring to post-test training. As such, the change in behavioural measures should be limited. The report

¹³ Gandolfi, J., *Perceptions of the Enhanced Rider Scheme and the role of attitudinal and behavioural assessment and coaching*, (Driving Research Ltd., 2011)

¹⁴ Gandolfi, J., *Enhanced Rider Scheme Participant Study – Phase 2: 2011-2012*, (Driving Research Ltd., 2012)

¹⁵ Fosdick, T., *National BikeSafe Evaluation: One Year After Attendance*, (2016)

¹⁶ Christmas, S., Young, D., Cookson, R. and Cuerden, R., *Passion, performance, practicality: motorcyclists' motivations and attitudes to safety – motorcycle safety research project*, (PPR442, TRL, 2009)

recommended that any future refinement of BikeSafe should give consideration to focusing on the consequences of skills limitations among riders and other road users.

Assessment: Best practice based on evidence

Motorcycle Shows (Cambridgeshire)

Motorcycle shows have been held at three locations in Cambridgeshire (Meldreth Bike Show, MCN Show in Peterborough and St Ives Festival of Motorcycling) since before 2000. The shows involve police motorcyclists and road safety officers providing information and advice to attendees and the promotion of BikeSafe courses.

The target audience is anyone associated with motorcycling and they are self-selecting. There are no specific behaviours which are targeted as the main purpose is to signpost attendees to BikeSafe and advanced riding. The events have not been evaluated.

Assessment: No evidence of best practice

Ride to Work Day (Cambridgeshire)

Delivered since 2010, Ride to Work Day is a multi-agency initiative delivered once a year in Cambridgeshire. It involves an organised escorted ride from Lazy Dayz Café to the Shire Hall in Cambridge and a chat with the riders over tea and biscuits, with small amounts of information provided.

The ride is advertised through all contacts, including BikeSafe and social media and riders are from across the spectrum. The main purpose of the ride is to increase awareness of motorcyclists amongst drivers by holding a mass event. The Day has not been evaluated.

Assessment: No evidence of best practice

TWIST (Cambridgeshire)

TWIST is an acronym of 'That's Why I should Think', the core elements of the campaign being a series of tongue-in-cheek animated short films which signpost riders to the campaign website (www.twistandride.net), which hosts information on post-test training. Initially, the campaign focused on schemes local to Cambridgeshire, but has expanded to host a database of over 40 courses available around the country.

The first phase of the campaign, in 2012, created a two to three-minute short film showing caricatured motorcyclist profiles involved in collisions. Feedback was polarised and particular emphasis was on the suggestion that a similar film should show things that drivers do wrong. In the second phase, three 30-60 second films were developed showing driver mistakes. The main tagline throughout signposts riders to further training as they come off worst in collisions so it is in their own interest to learn to anticipate other road user's actions. Social media delivery of the campaign ceased in 2015, but there is a continuous online presence.

The target audiences for the campaign were identified through analysis of collisions and existing research related to motorcyclist sub-groups. The research undertaken in the development of the campaign identified key target profiles: 'Scooter boy' (16-17 year-old boy using his bike as a means of getting from A to B); 'Power Ranger' (high powered motorcycle, involved in single vehicle collisions); and 'Born-Again Biker' (returning to riding on tourer type bike, generally aged 35 to 55 years old).

The campaign aims to target risk-taking, over-confidence, rider error and hazard perception. A number of objectives are set for the campaign: in the short term engaging with targeted PTW riders in safer messages and recruiting riders to ScooterSafe and BikeSafe courses; in the medium term increasing the skills level of PTW riders and developing a better understanding that their actions can mitigate the risk of being involved in a crash; and in the long term reducing the number of PTW casualties.

The campaign has been evaluated in relation to the short term aims with the initial animation achieving over 30,000 views and generating lots of discussion among motorcyclists, (both positive

and negative), which created an opportunity to discuss issues and engage with riders. Riders engaged with BikeSafe courses but there was no take-up for ScooterSafe. The medium and long-term objectives have not been evaluated.

Assessment: Worth considering but more evidence required

Biker Down (Hertfordshire)

Biker Down is a free three-hour course delivered to motorcyclists in three modules, which respectively cover 'what to do when first on scene at an accident'; 'basic lifesaving first aid actions'; and 'how to enhance your conspicuity and prevent accidents at junctions'. It is a national initiative, developed initially by Kent Fire and Rescue Service, which is delivered locally by Hertfordshire Fire and Rescue Service with Herts and Beds Advanced Motorcyclists.

It was first delivered in Hertfordshire in 2014 and has been delivered every year since then. The target audience is all types of motorcyclists but tends to attract older 'power bikers'.

Biker Down has been evaluated locally and since then a partnership with Hertfordshire County Council Behavioural Science Unit has been developed to create pre-and post-course questionnaires to better evaluate the effectiveness of the course. An initial evaluation of 118 candidates on the previous format of evaluation found extremely positive feedback post-course but the questions were limited in terms of behavioural measures and it was more of a process evaluation (focusing on candidates' views of the venue, instructors and course content). The future evaluation will provide a better insight into effectiveness.

Assessment: Worth considering but more evidence required

Rider magazine (Hertfordshire)

Rider is an online magazine for the motorcycling community, produced by First Car. The magazine covers a range of motorcycling issues but retains underlying safety messages. It is not pitched as a road safety document but road safety messages are included alongside valuable and engaging content. Content is localised and offers good advice and tips for riders (such as best protective clothing), combined with information on interesting rides.

The magazine was previously called Biker and started in 2010. The magazine changed format and went online as Rider in 2015. It is currently published twice a year, although issues were more frequent in the past and this is being examined again.

The target audience is all riders but road safety professionals are particularly interested in making the product inclusive and including young riders on mopeds and older riders on powerful bikes, both of which represent the motorcycling community in Hertfordshire.

The magazine has been evaluated but not recently.

Assessment: No evidence of best practice

BikeSafe (Hertfordshire)

As explained in the Cambridgeshire section, BikeSafe is a national scheme with workshops which combine theory with practical riding, including observed rides, an assessment and a referral. The overall aim is to encourage the take-up of post-test training.

In Hertfordshire, workshops have been delivered every year since 2006, with four workshops a year.

The results from the national evaluation are set out in the section: BikeSafe (Cambridgeshire) on page 23.

Assessment: Best practice based on evidence

Progress Motorcycling (Suffolk)

Progress Motorcycling was first delivered in 2012 with a group of ex-police officers who offered to accompany motorcyclists on a ride which is video-recorded, and then provide feedback on their performance.

Full licence holding motorcyclists were invited to take a ride with an ex-police motorcyclist who videos the ride for a full discussion afterwards. There is no cost to the customer. The purpose was to address unsafe riding and poor skills by giving riders advice on how to ride more skilfully.

It is not known if the initiative is still running or if it has been evaluated.

Assessment: No evidence of best practice

Young Apprentice Scheme (Suffolk)

Suffolk County Council employs a Young Apprentice (NVQ Level 3 in Youth Work) within the road safety team, who is about to take delivery of a moped. Working with Wheels to Work, Ipswich Rider Training and the road safety team, her progress through CBT and other training will be blogged and promoted on social media as a way of interacting with other young riders.

The target audience is 16 to 24-year-old young riders, identified through casualty analysis. The content will cover obtaining a machine, correct training options, attitudes to safety, correct clothing and peer group pressures.

The intervention has not been delivered yet but an evaluation is planned to be incorporated into the scheme.

Assessment: Worth considering but more evidence required

Firebike/Biker Down (Suffolk)

Suffolk Fire and Rescue Service deliver the Firebike and Biker Down initiatives to give post-crash advice, basic first aid and advice on safe riding. It is often delivered in conjunction with the Police Safe Rider courses.

Invited motorcyclists are shown, in a classroom environment, what to do at the scene of a crash involving a motorcyclist. First aid advice is given as well as general riding advice. A Fire and Rescue service marked up motorcycle is used as a publicity device. It was first delivered in Suffolk in 2015 and every year since.

Currently, the target audience is experienced riders and it is hoped to be developed for younger riders soon. It has not been evaluated in Suffolk but see the section on page 25 for the evaluation of Biker Down (Hertfordshire).

Assessment: Worth considering but more evidence required

Suffolk Hugger (Suffolk)

The Suffolk Hugger campaign, which comprises of roadside posters, publicity events (including at colleges) and engagement through Twitter and Facebook, is part of a Norfolk County Council led campaign.

Publicity events are designed to encourage riders and drivers to have safer attitudes and reminder posters placed on the most used motorcycle routes. There is also a dedicated website. Suffolk Hugger started in 2014 and it has been delivered ever since, with a target audience of all riders and other road users. The main purpose is to encourage drivers and riders to consider one another and seeks to achieve a better understanding of the vulnerability of powered two wheel users.

The intervention has been evaluated by Norfolk County Council and is detailed on page 31 in the section on Hugger's Challenge (Norfolk).

Assessment: Worth considering but more evidence required

College open event (Suffolk)

Open days are held in several large further education colleges in Suffolk where students are engaged with using a motorcycle simulator, a dynamometer, a moped with indicated faults, a reaction timer and printed materials and publicity freebies.

The initiative started in 2011 and was also delivered in 2013 and 2015, upon the invitation of colleges and the availability of support agencies. A day is spent in a local college motorcycle parking area with trained mechanics offering bike checks. There is a mobile display and staff from Suffolk County Council, Suffolk Police and Suffolk Fire and Rescue Service giving advice to attending riders.

The target audience are mostly young inexperienced riders, many on poorly maintained machines; a group identified through collision statistics and discussions with college staff. The main target behaviours are to improve machine maintenance, prevent illegal machines, increase the use of rider protective clothing and improve attitudes towards safety.

The intervention has not been evaluated.

Assessment: No evidence of best practice

Rider Plus/Young Rider (Suffolk)

Rider Plus/Young Rider is an initiative offering further rider training at a small cost, plus extra training for recipients of scooters provided by the Wheels to Work scheme (participants are rewarded with one month's free rental), paid for by Suffolk County Council.

The scheme, which is part self-funding, started in 2011 and has been delivered every year since. It targets experienced motorcyclists wanting further advanced training and less experienced riders needing training beyond CBT. The purpose is to identify poor riding techniques and encourage improvement, through demonstrating techniques to avoid many of the common crash types. The training is student centred.

There has not been a full evaluation although there is continued support from Community Action leaders and there has been a reduction in the number of reported crashes amongst those using Community Action scooters.

Assessment: No evidence of best practice

Safe Rider (Suffolk)

Safe Rider is a development of the National BikeSafe course, where Suffolk Police motorcyclists provide theory and practical training sessions throughout the summer months for experienced motorcyclists.

Part-funded by Suffolk Police and a contribution from each client, the intervention includes theory and practical assessment rides. It is delivered approximately six times a year since 2005. Experienced motorcyclists are assessed in order to identify poor riding techniques and encourage improvement through the uptake of further training.

It has not been evaluated in Suffolk but similar schemes, such as BikeSafe, have been shown to meet the key objective of encouraging the take up of post-test training.

Assessment: Worth considering but more evidence required

Wheels to Work (Suffolk)

The Wheels to Work scheme is an initiative where clients are lent scooters to access education or employment. Since 2013, 45 riders have been trained. Community Action Suffolk are the lead agency with clients paying £40 a week towards expenses.

Clients are people who require transport for work and/or education activities but cannot afford to pay for it out of their own funds. A machine (50 or 110cc) is provided, with some protective clothing

and access to training (CBT and an offer of a Young Rider course). After six months, it is expected that the client will be able to fund their own transport and return the motorcycle. The target audience for the scheme is disadvantaged job seekers and those in education requiring personal transport.

Safety advice is given as part of the lending scheme, with the aim of reducing the chances of collisions in the early days of ownership. It provides transport for a group who otherwise would not be able to afford it.

The scheme has been evaluated through Community Action and has been supported by Government funding. However, no details of its effectiveness were available.

Assessment: *Worth considering but more evidence required*

Safe Rider (Norfolk)

Safe Rider first started in 1998, introducing riders to police riding practices with a classroom session, demo ride and assessed rides. It was eventually absorbed into BikeSafe and dual branded. It split from BikeSafe two years ago and reverted to its original title following disagreements with BikeSafe over the cost of the national booking system and other prescriptive issues.

Safe Rider involves a classroom session, based around a series of downloadable rider skills' documents and group activity sessions. This is followed by a road session with a demo ride and assessed rides by a police motorcyclist. It has been delivered every year since 1998, with ten courses of 150 people each year.

The target audience are full licence holders with no other restrictions. Groups are matched according to experience and type of bike, with the target group predominantly middle aged on larger motorcycles, echoing the KSI casualty figures.

The target behaviours are: selecting the appropriate speed for the conditions, road position, reading bends, observation and planning issues. All of these behaviours are standard Roadcraft practice. The sessions aim to get riders to think about what they are currently doing and make them realise that there is so much more to learn, pointing them towards further training with advanced riding groups or with bespoke training through Norfolk County Council.

An evaluation was conducted by RSN Associates¹⁷, which found that the scheme was hugely popular. Evaluation involved the use of two questionnaires: one given out at the end of the course (validation questionnaire) and another several months afterwards (post-course). No baseline data were collected from participants. All of the questions are open-ended and therefore required coding before any analysis could take place. In the post-course phase, 51 questionnaires were reviewed and a third reported not being involved in any collisions or near misses, with many cited that the skills that they had learnt had prevented incidents from occurring. However, without baseline collision involvement rates and closed, less subjective questions, it is difficult to quantify the efficacy of the scheme.

Assessment: *Worth considering but more evidence required*

Pedsafe (Norfolk)

Pedsafe is a PowerPoint based presentation aimed at school students in Year 11, particularly those who own a motorcycle or who are seriously considering it. The scheme borrows some material from the now defunct Bare Bones project from Nottinghamshire. Starting in 2010, the scheme has been delivered every year since then, with an average of six sessions a year. However, it can be very difficult to get into the schools in Year 11 because of the busy school year.

The target group were identified through the casualty statistics and the scheme aims to highlight the risks associated with motorcycling activity. It points out the increasing severity of injury caused directly by wearing inappropriate clothing; the hazards of peer group pressures; the costs involved

¹⁷ Clayton, A. And Platt, V., *An evaluation of a Motorcycle Campaign in Norfolk*, (RSN Associates LLP, 2010)

in motorcycle ownership; Section 59 offences and the issues with de-restriction of machines; and common road hazards. It addresses these behaviours by getting young people to think about the consequences of their own and other people's behaviour.

A short questionnaire¹⁸ was used at the end of the presentation. One set of 13 completed questionnaires were received from one presentation. The evidence from this small sample suggested that the presentations were received positively but the small sample size prevented any firm conclusions from being reached.

Assessment: No evidence of best practice

Norfolk and Suffolk Biker Magazine (Norfolk)

Norfolk and Suffolk Biker Magazine is an annual magazine which is designed to integrate road safety messages and advertise training courses and Rider Skills downloads with other more general interest material. It was started in 2015 and has been delivered ever since.

The target audience is anyone but the content is aimed at full licence holders and mainly the older audience, rather than young riders. It is primarily a promotional tool for training options and is in a format that is more likely to be kept by readers than flyers.

A smart survey is in place for readers to provide feedback on what they think about the magazine, what encouraged them to take it home, what interested them, what type of rider they are and whether they have taken any training after reading the magazine. The survey is promoted with a prize draw but response levels are low. There has been positive feedback but there have been insufficient responses to form a genuinely useful picture. Improved prizes for 2017 may improve the response rate.

Assessment: Worth considering but more evidence required

i2i Motorcycle Academy (Norfolk)

In Norfolk County Council's search to provide something different that may attract 'harder-to-reach' riders, the road safety team joined with the i2i Motorcycle Academy based in York, who travel to Norfolk for three weeks of the year and deliver machine control courses.

The courses are funded by clients, in which they examine the physics of what makes bikes do what they do. They learn stability control exercises; how to relax and let the bike sort out its own problems; how stable the bike is until the rider interferes with it; advanced braking exercises; counter steering; the cone effect; hazard avoidance; and low speed control. The intention is to retrain instinctive reactions so that if things should go wrong, the rider is less likely to do the instinctive thing which very often will make matters much worse.

The course started in 2010 and has been delivered over three weeks annually since then, with approximately 800 riders trained in that time. Motorcyclists attend with their own machines at an airfield. Riders are recommended to do the course and the course trainers recommend that riders do some form of Roadcraft based training as the i2i courses are explicitly an add-on to defensive riding based training, not an alternative to it.

The target audience is anyone, with the aim of retraining instinctive reactions to stop inappropriate emergency braking techniques and dangerous use of the back brake as well as increasing the understanding of vehicle stability and the physics that control the bike, increasing confidence in low speed riding.

The scheme has been evaluated internally through Survey Monkey to measure changes in perceptions and understanding, which found improvements in people's understanding and confidence levels.

Assessment: Best practice based on evidence

¹⁸ Clayton and Platt, (2010)

Norfolk and Suffolk Road Casualty Reduction motorcycle team (Norfolk)

Suffolk and Norfolk Constabulary, in conjunction with the two separate road safety partnerships, have four police motorcyclists each. These are funded from road safety partnerships and diversionary course funds.

The activities, undertaken by the two teams of police motorcyclists, focus on education and prosecution. Both teams follow the National Roads Policing campaign calendar in conjunction with Tispol and NPCC. Casualty reduction offences, including Fatal 4 offences, are dealt with robustly. It involves policing of known motorcycle hotspots. Education is delivered in the form of roadside advice, stands at local shows and at motorcycle events and through local motorcycle dealers, schools and further education premises.

The combined targeted activity began in 2015 and has continued since, with vulnerable groups, including full motorcycle licence holders of all ages and young inexperienced riders targeted. The purpose is to promote safe riding and reduce aggressive riding through education and enforcement.

There has not been any formal evaluation, although enforcement activities are reported back to the partnerships.

Assessment: Worth considering but more evidence required

Hugger's Challenge (Norfolk)

The Hugger Branding was created to carry the motorcycle road safety messages in Norfolk (since bought into by Suffolk and Essex County Councils). It addresses motorcyclist training messages and advice to riders as well as addressing car drivers with the Think Bike message (through the use of car stickers and roadside signs).

As part of this, Hugger's Challenge was created as a training option linked to the DVSA Enhanced Rider Scheme and conducted by trainers on the Register of Post Test Motorcycle Trainers (RPMT). As detailed in the section on Pan-Regional Enhanced Rider Scheme (Bedfordshire), there were marketing issues with ERS nationally and issues with the format of ERS led to Norfolk disengaging with the national scheme and making it more customer-focused locally. The course is tailored to the needs of the client, rather than adhering to a DVSA topic guide that does not address what the client wants to improve. If a client is a provisional licence holder wanting training, it is delivered by DVSA approved CBT/DAS trainers to avoid any conflict with what will be required for test level by DVSA.

The course, which is one-to-one assessment and instruction, has been in place since 2009 and has been delivered annually since. The clients pay for courses and so far, 420 riders have been trained. The target audience consists of riders who require an assessment or training either before or after Safe Rider, don't want a police-led course or don't like riding in a group.

It seeks to teach appropriate speed for the conditions, reading bends, road position and lines through bends, observation and planning issues and overtaking. The purpose is to assess riders' current standards and advise and train where necessary to improve safety margins.

The course was evaluated¹⁹ through a pre-questionnaire before the ride and one a few weeks afterwards (or after any additional training). Pre-ride questionnaires were received from 24 riders and post-ride questionnaires from 45 riders, with 14 completing both. The pre-questionnaire asked how they had heard about Hugger's Challenge, why they chose to apply and information about themselves and their riding history. The post-questionnaire included process questions about booking the ride, arranging the ride with the instructor, the ride itself and the final debriefing. It also asked about skills improvement, overall views and additional training. There were positive responses to the organisational questions and respondents reported improved skills after the assessment ride.

¹⁹ Clayton and Platt, (2010)

Six respondents were advised to take additional training and four had done so by the time they had completed the questionnaire.

Assessment: Best practice based on evidence

Firebike (Essex)

FireBike is Essex County Fire and Rescue Service's educational and engagement product designed to promote motorcycle safety throughout Essex. It positively engages with motorcyclists and their pillion on a range of safety and related issues. The aim is to promote safer riding; encourage the use of personal protective equipment; and promote the benefits of advanced rider training.

The FireBike key messages are: become a better rider; train as if your life depends on it; protect yourself and your pillion; and learn to share the road. The FireBike product has four motorcycles and nine team members (to be increased to 11 in 2017). All team members are advanced motorcyclists and advanced instructors with RoSPA.

FireBike was started in 2009 and has been delivered annually every week during the main motorcycling season. It targets engagement with riders who are aged 16 to 28 years old on bikes with engines no more than 125cc; aged 21 to 30 on bikes with engines over 500cc; aged over 30 years on bikes with engines smaller than 500cc; and aged 31 to 60 years on bikes with engines over 500cc. It engages with motorcyclists at known biker meeting locations in the county, at specific events and rallies, at motorcycle dealerships and at motorcycle clubs. There is the target of attending/delivering 100 events per year and engaging with 2,000 riders.

It has been evaluated through rider engagement questionnaires, where 100% of respondents 'strongly agreeing' or 'agreeing' that FireBike is worthwhile and effective at delivering motorcycle specific road safety advice and information. However, no further information was provided on specific evaluation methodologies, sample sizes or if proxy measures for behaviour were incorporated into the evaluation.

Assessment: Worth considering but more evidence required

Firebike Better Biking Courses (Essex)

The FireBike Better Biking Courses provide on-road observed riding assessments for motorcyclists as an alternative choice to Police BikeSafe workshops and are designed to attract riders who otherwise would not be inclined to undertake further training.

The courses comprise of a one-hour classroom session on motorcycle safety/roadcraft (the principles of advanced riding) followed by a four-hour observed ride on urban and rural roads. The assessed ride provides practical advice and guidance about observation, hazard perception, positioning, speed, gear selection and overtaking. The observer provides the motorcyclist with feedback on their riding, highlighting strong points and suggesting areas where improvements can be made through practice. Options to pursue further rider training opportunities are explained. It was first delivered in 2013 and has been provided weekly during the riding season ever since.

The target audience is specifically 21 to 60 year olds on 500cc+ engines and 30+ year olds with engines smaller than 500cc. The overall aim is to improve skills and rider behaviour. The courses have been evaluated with post-course questionnaires, where positive feedback has been received. However, no details of the evaluation were provided in terms of sample size and the responses quoted appear to indicate that a process evaluation was undertaken.

Assessment: Worth considering but more evidence required

Firebike Advanced Machine Skills Courses (Essex)

The focus of the FireBike Advanced Machine Skills Course is all about machine control – slow speed handling, positive steering, merging, swerving skills, emergency avoidance techniques and advanced braking skills. The course is all about sharpening some key skills which are rarely practiced but help

improve riding on the road and reduce the chances of a collision. The courses are run at a local airfield and are delivered in partnership with a team of highly experienced instructors.

The courses were first delivered in 2010 and have been delivered annually, every month between April and October, ever since. A variety of rider types are targeted with the intervention including young riders on smaller machines, older riders on smaller machines and those across the age ranges on larger motorcycles. The courses are promoted during face to face engagements and through social media. Word of mouth recommendations from course participants are also really important.

The courses have been evaluated with post-course questionnaires, where positive feedback has been received. However, no details of the evaluation were provided in terms of sample size and the responses quoted appear to indicate that subjective feedback was provided (as opposed to using proxy measures to assess change)

Assessment: Worth considering but more evidence required

BikeSafe (Essex)

Essex Police lead on BikeSafe in the county. The workshop explores the main riding hazards bikers face. By delivering theory presentations and observed riders, a BikeSafe workshop helps riders discover their strengths and weaknesses and also where to go next to develop and get more from their biking. It has been delivered in Essex since 2000 and six BikeSafe workshops are provided each year.

The results from the national evaluation are set out in the section: BikeSafe (Cambridgeshire) on page 23.

Assessment: Best practice based on evidence

Hugger Advanced Instructor Training Days (Essex)

The Advanced Instructor training days are offered to motorcyclists as part of the Essex Hugger Challenge initiative, for those riders having already undertaken a FireBike Better Biking Course or an Essex Police BikeSafe course.

The Advanced Instructor days build on those two courses but are delivered for a full day on a 2:1 student-instructor ratio, using radio communications. These days provide more in-depth instruction to improve motorcyclists' general roadcraft skills. Skills include observation, hazard perception, road positioning, speed, gear selection and overtaking. The intervention started in 2015 and has been delivered weekly during the biking season since. Target riders are motorcyclists on larger engine machines or those aged over 30 years on smaller motorcycles.

The courses are promoted through face to face engagements, on websites and through social media. Positive word of mouth recommendations are significant.

No formal evaluation has been undertaken to date but feedback questionnaires are being introduced in 2017.

Assessment: No evidence of best practice

Essex Hugger Challenge (Essex)

The Essex Hugger Challenge was first delivered in 2015 and is designed to encourage motorcyclists to undertake additional training and to improve their on-road riding skills and their machine control skills. It encourages riders to undertake the Better Biking Course or BikeSafe Workshop, which entitles them to attend a FireBike Advanced Machine Skills Course and a full day's rider training with one of the commercial advanced riding instructor partners. The Challenge is delivered weekly during the biking season and targets the same rider types as the related courses.

Safer Essex Roads Partnership (SERP) holds the view that improving the road riding and machine control skills of motorcyclists is key to reducing killed or seriously injured casualties. The adoption of the Hugger campaign in Essex created the opportunity to draw together all partners' motorcycle safety initiatives, and to offer rider training opportunities in one package.

The courses available under the Essex Hugger Challenge are promoted through face to face engagements, on websites and through social media, as well as through word of mouth.

The Challenge itself has not been evaluated and whilst individual courses are, the evaluations could be stronger.

Assessment: Worth considering but more evidence required

Essex Hugger Campaign – Other road users (Essex)

The Essex Hugger Campaign is an Essex-wide promotional campaign specifically targeting other road users and to encourage them to be aware of and consciously look out for motorcyclists and other P2W riders. Collision analysis shows that other road users contribute to a significant proportion of incidents involved motorcyclists.

Safer Essex Roads Partnership and its partners had long been involved in a number of activities aimed at the rider, but there had been little or no focus on specifically educating other road users to look out for motorcycles. The campaign is focused around key collision locations across Essex and involves a combination of bus back advertising, radio slots and washroom advertising in key locations. In 2016, the campaign involved petrol station forecourt advertising as well.

The campaign's key messages are related to drivers failing to see P2W riders, misjudging the P2W rider's path and misjudging the P2W rider's speed.

The campaign has not been evaluated in Essex.

Assessment: No evidence of best practice

Motorcycle Pitstop Events (Essex)

Motorcycle Pitstop Events are staged on key motorcycling routes in Essex and all motorcyclists on that route are pulled in by police officers. The riders are offered free refreshments in exchange for a dialogue on motorcycle safety and to promote the rider training opportunities provided under the Essex Hugger Challenge. The event is held four times a year and has been delivered annually since 2010.

The target audience are those riders who could and should take up the training courses offered under Hugger Challenge. In 2017, the target is to hold four events and achieve engagement with at least 800 riders. There will also be a series of smaller motorcycle dealer engagement days with the target of engaging with 200 riders. Around 30% of those interacted with at Pitstops go on to undertake one or more of the Essex Hugger Challenge courses.

The events were evaluated in 2016 and there was a strong positive endorsement of the quality of the Pitstop intervention, and strong support for the range of rider training opportunities available. Further details of the evaluation methodology and sample sizes were not provided.

Assessment: Worth considering but more evidence required

Young Moped/Scooter Rider Education Days (Essex)

Young Moped/Scooter Rider education days involve delivery of a dedicated moped and scooter safety presentation package, involving a combination of a structured lecture, video films and still images. This presentation is specifically designed to give young prospective and novice riders, aged 16 to 25 years old, an understanding of the specific risks associated with riding a moped or scooter on the road.

The intervention started in 2010 and is delivered six to eight times a year. The target audience are young riders on machines with engines no more than 125cc. In 2016, the SERP target was to engage with 70 young riders, although in 2017 there is to be a significant increase in the target interventions associated with the new Street Spirit campaign (below). Young riders are primarily engaged with at schools and colleges and there are also some general 'drop in' visits at some known young rider meeting locations.

With key target behaviours of general roadcraft, hazard perception and vehicle maintenance as the main focus of the sessions, the aim is to improve the risk awareness of young prospective and novice riders.

The evaluation of the education days involved feedback questionnaires where positive feedback about the presentation was provided and that the participants reported that they had learnt new things about safety and that it would make them think more. There was no information provided on sample size or if the evaluation involved proxy measures for actual behaviour.

Assessment: *Worth considering but more evidence required*

Street Spirit Moped/Scooter Safety Campaign (Essex)

A new initiative for 2017 is 'Street Spirit' which is a campaign involving a major competition with the chance to win two top prizes (a brand new 50cc and 125c moped with all the personal protective equipment (PPE) and CBT training, if appropriate); three runners up prizes of full PPE; 'Street Spirit' promotional material, involving a dedicated website, including an online hazard awareness game; and education and engagement with young riders at schools and colleges. The direct interaction involves delivery of a presentation; provision of maintenance advice (including free mechanical checks); trial rides on a closed course for those young people about to embark on riding a P2W; 20 minute on-road assessed rides for those already riding; and drop-in engagements with young riders at known meeting locations. There is a target of reaching 2,500 young and prospective riders with this campaign.

The aim is to target general roadcraft, positioning, hazard perception and vehicle maintenance. The campaign has not started yet so there are no evaluation results, although it will be evaluated through feedback questionnaires.

Assessment: *Worth considering but more evidence required*

Best Practice Findings

Best Practice Interventions

Figure 7 shows the five interventions which were considered 'best practice' based on the identification of target audiences, supporting information and evaluations. All of the best practice interventions are related to advanced rider training – either through the assessment and referral of riders or through actual training schemes.

Figure 7 *Best Practice Interventions*

	Cambridgeshire	BikeSafe	National evaluation - BikeSafe achieved its aim of pointing at least 20% of attendees to post-test training. Work needs to be done to establish the efficacy of post-test training.
	Hertfordshire	BikeSafe	National evaluation - BikeSafe achieved its aim of pointing at least 20% of attendees to post-test training. Work needs to be done to establish the efficacy of post-test training.
	Norfolk	i2i Motorcycle Academy	Internal evaluation via Survey Monkey to measure changes in perceptions & understanding. High improvement in understanding & confidence levels



Norfolk

Hugger's Challenge

Sample size of 45 riders in a post-intervention evaluation. Reported that skills were improved, post-training. Extremely positive feedback



Essex

BikeSafe

National evaluation - BikeSafe achieved its aim of pointing at least 20% of attendees to post-test training. Work needs to be done to establish the efficacy of post-test training.

Interventions Worth Considering

Figure 8 shows the 24 interventions which are worth considering but where extra evidence of efficacy would be useful. These include a range of intervention types, including training, awareness-raising, events, advice-giving and enforcement.

Figure 8 *Interventions Worth Considering*



Bedfordshire

MTM 1st Ride Pre-CBT

Demonstrated benefits and enhancing the CBT seems a positive move but need evidence of value over and above the CBT itself.



Bedfordshire

MTM Bedfordshire Biker Magazine

With such a small sample of post-only questions by a self-selecting audience, it is difficult to assess the value of the magazine. Could be a useful tool for event promotion and providing tips and advice – more evidence needed.



Bedfordshire

MTM Biker Risk Profiler

Initial analysis indicates it is a valid instrument but needs more analysis with larger sample. Shows promise as a tool used in conjunction with a coaching-based approach



Bedfordshire

MTM Ride Free open day

Attendees tended to be older, experienced riders – focus should be on training promotion. 40% had not done training in last 10 years. Intentions to take further training didn't improve



Bedfordshire

MTM Ride Safe

No clear aims & objectives measured against. Primary purpose is to encourage post-test training but this was not assessed. Process evaluation suggests that right audience were targeted.



Bedfordshire

MTM Take Control post-CBT

Small sample size of 20 participants who completed a pre-and post-evaluation on the day of training (no long-term effectiveness assessed). Significant improvements in a variety of measures.



Bedfordshire

Enhanced Rider Scheme

Small sample size of 18 participants. 8 were experienced riders & 8 had completed post-test training or assessments already. Self-reported measures



Cambridgeshire

TWIST

Short-term evaluation with initial reach of 30,000 views, generating lots of discussion. Riders engaged with BikeSafe but no take-up of ScooterSafe.

	Hertfordshire	Biker Down	An initial evaluation of 118 candidates on the previous format of evaluation found very extremely positive feedback post-course but the questions were limited in terms of behavioural measures.
	Suffolk	Young Apprentice Scheme	Project is now starting so no evidence yet of effectiveness
	Suffolk	Firebike/ Biker Down	No evaluation in Suffolk and process of evaluation in Hertfordshire provided positive feedback but no measures of behaviour change
	Suffolk	Suffolk Hugger	Evaluation in Norfolk shows strong brand recognition.
	Suffolk	Safe Rider	Reported fewer near misses or collisions and occasions where their new skills had resulted in evasive action. Some limitations in the questionnaire design.
	Suffolk	Wheels to Work	Evaluated and positive feedback reported but no details provided
	Norfolk	Safe Rider	Reported fewer near misses or collisions and occasions where their new skills had resulted in evasive action. Some limitations in the questionnaire design
	Norfolk	Norfolk & Suffolk Biker Magazine	Smart survey gives feedback on content & whether it has led to further training. Small sample size so difficult to assess effectiveness presently
	Norfolk	Casualty Reduction Teams	Enforcement activities are reported back to partnerships
	Essex	Firebike	Evaluated through questionnaires, with respondents stating that it was worthwhile and effective. (No details of proxy measures beyond satisfaction levels)
	Essex	Firebike Better Biking Courses	Evaluated through questionnaires, with respondents stating that it was worthwhile and effective. (No details of proxy measures beyond satisfaction levels)
	Essex	Firebike Advanced Machine Skills Courses	Evaluated through questionnaires, with respondents stating that it was worthwhile and effective. (No details of proxy measures beyond satisfaction levels)
	Essex	Essex Hugger Challenge	No evaluation of the campaign itself but the related courses are all evaluated.
	Essex	Motorcycle Pitstop Events	The events were evaluation in 2016 and there was a strong positive endorsement of the quality of the Pitstop intervention, and strong support for the range of rider training opportunities available.



Essex

Young Moped/Scooter Rider Education Days

The evaluation involved questionnaires where positive feedback about the presentation was provided and that the participants reported that they had learnt new things about safety and that it would make them think more.



Essex

Street Spirit Moped/Scooter safety campaign

New initiative so no evidence yet to show efficacy.

Interventions with limited evidence of efficacy

Figure 9 shows the interventions where there is no or limited evidence of effectiveness. This is not to say that these interventions are ineffective or have unintended consequences, but insufficient information was provided or no evaluation has been undertaken to make a judgement. These interventions have tended to be large scale publicity events, which can be difficult to evaluate as prior contact with the target audience is difficult to achieve.

Figure 9 No evidence of best practice



Bedfordshire

Winter Skills Day

Small sample size of 16 participants. Post-only questionnaire, asking them to report on skills & knowledge they think they have gained.



Cambridgeshire

Motorcycle Shows

No specific behaviours targeted and no evaluation undertaken.



Cambridgeshire

Ride to work day

Targeting driver awareness of motorcyclists but no evaluation undertaken.



Hertfordshire

Rider magazine

No recent evaluation to determine who the readership consists of or what messages they are taking from the content.



Suffolk

Progress Motorcycling

It is not known if the initiative is still running or if it has been evaluated.



Suffolk

College open day

No evaluation to determine if target audience are absorbing the key messages and behaving differently as a result.



Suffolk

Rider Plus/Young Rider

Limited feedback reports a reduction in the number of reported crashes amongst those using Community Action scooters.



Norfolk

Pedsafe

Small evaluation of one class. No real conclusions could be reached.



Essex

Hugger Advanced Instructor Training Days

No formal evaluation to date



Essex

Essex Hugger Campaign – other road users

No evaluation in Essex

Recommendations

Collaboration and Duplication

The process of synthesising the motorcycle road safety interventions has shown that there are similar approaches being delivered independently across the region. This does not necessarily mean that there is duplication, but knowing where similar interventions are being delivered could afford opportunities for collaboration, sharing best practice and achieving economies of scale.

Figure 10 shows ten interventions where collaboration across the region might be possible. From the casualty analysis detailed earlier, it is known that motorcyclists travel across the region and are involved in collisions in the East but outside of their own home area. It therefore makes sense to deliver consistent, co-ordinated messages.

One opportunity is through magazines. There are currently three different magazines produced in the East. Whilst it is important to retain a local focus, there could be benefits to including articles that cover riding routes from across the region, or the same safety article or special feature could be included in multiple magazines. Areas which do not currently produce a magazine might want to consider buying into one of the existing products, thus achieving economies of scale. Further collaboration could facilitate evaluation opportunities to ensure that the readership reflects the intended target audience and that the key messages are being absorbed. Consideration could be made to pooling resources for one biker magazine for the whole of the East.

There are currently seven assessment interventions being delivered in the East. There are differences in approach with these assessment programmes, with Bedfordshire's Ride Safe being clearly defined as not training whilst Norfolk and Suffolk's Safe Rider appears to include training elements. BikeSafe is clearly defined at the national level as a referral tool and is not designed to be training, although delivery may differ locally. These differences make it difficult to recommend collaboration of courses beyond the adoption of National BikeSafe (which may not suit all), but there are opportunities to promote other schemes in cross-border work. So, when engaging with motorcyclists across the region, it could be possible to signpost riders to the various assessment options available in the East.

There are also four specific training courses (beyond those offered by local advanced riding groups). The two training courses previously offered in Bedfordshire have been included as concepts from these could be shared elsewhere in the region. The training courses differ in terms of target audience and cost and some of the courses are part of a defined local programme of assessment and training. Despite these differences, there may be elements of these training courses which could be shared across the region, and there could be opportunities to signpost riders to courses across the East rather than just in their particular home area.

There are also two areas offering the same Biker Down course of first aid training and conspicuity advice. If the same syllabus is being followed in both areas then there could be opportunities to collaborate on an evaluation of the course.

Figure 10 Interventions with similar characteristics

	Bedfordshire	MTM Bedfordshire Biker Magazine
	Hertfordshire	Rider Magazine

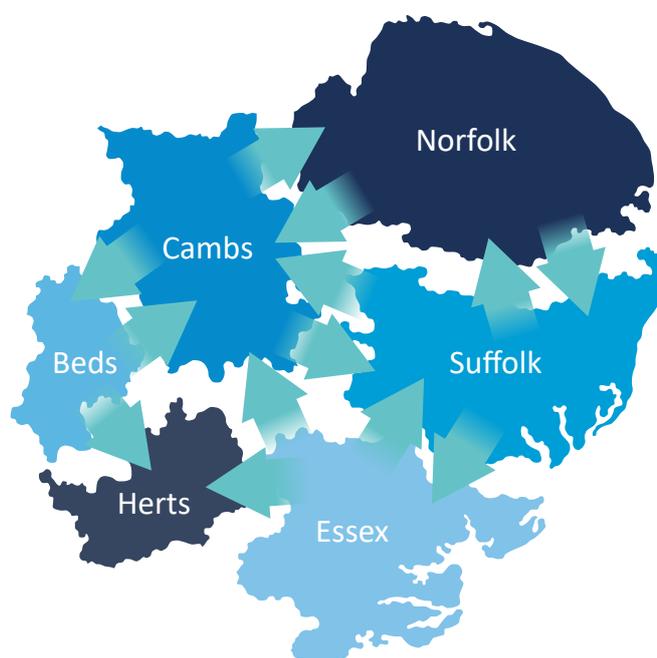
	Norfolk	Norfolk & Suffolk Biker Magazine
	Bedfordshire	MTM Ride Safe
	Cambridgeshire	BikeSafe
	Hertfordshire	BikeSafe
	Suffolk	Safe Rider
	Norfolk	Safe Rider
	Essex	Firebike Better Biking Courses
	Essex	BikeSafe
	Bedfordshire	MTM 1st Ride pre-CBT
	Bedfordshire	MTM Take Control post-CBT
	Suffolk	Rider Plus/Young Rider
	Norfolk	i2i Motorcycle Academy
	Essex	Firebike Advanced Machine Skills courses
	Essex	Hugger Advanced Instructor Training Days
	Hertfordshire	Biker Down
	Suffolk	Biker Down

In addition to sharing ideas and achieving economies of scale through working on similar projects together, collaboration between specific areas should be encouraged. As highlighted in the section on Movement across the region on page 9, the casualty analysis has revealed that there are specific areas which have high numbers of casualties from outside of their area involved in collisions on their roads. Epping Forest, Hertsmere and Three Rivers are all areas where there are high importing and low exporting of casualties. Conversely, there are areas where riders are not coming in to crash on local roads but local residents are particularly at risk, especially elsewhere on the region's roads. Castle

Point, Great Yarmouth and Luton could all collaborate with neighbouring areas to communicate with their residents to reduce their risk elsewhere.

Looking at rider crash involvement at the partnership level, Bedfordshire could benefit from working with Cambridgeshire and Hertfordshire. In addition to working with Bedfordshire, Hertfordshire could also work with Essex, whilst Cambridgeshire should seek to develop relationships with Essex, Norfolk and Suffolk, as well as Bedfordshire. Essex should be working with its neighbours of Hertfordshire, Cambridgeshire and Suffolk, with Norfolk also working with these latter two counties. Suffolk, having multiple neighbouring authorities, has import and export relationships with Norfolk, Cambridgeshire and Essex. These relationships are shown in Figure 11.

Figure 11 Import and Exporting of P2W Casualties by Partnership Area



Gap Analysis – What’s Missing?

Whilst the range of interventions submitted covered a variety of activity types and are aimed at the full spectrum of at-risk motorcyclists, there are some elements which could be described as ‘missing’.

- 1 **A focus on young riders** - The casualty analysis highlighted that 23% of the riders involved in KSI collisions in the East were classified as young riders, yet this group had the lowest percentage of interventions aimed at it. Conversely, a larger percentage of interventions were targeted at leisure riders when this group only represented 11% of KSI involved riders.
- 2 **Evaluations** - Many interventions are not evaluated or if they are, small sample sizes are used or the evaluation methodology is limited to a post-intervention only study where the questions focus on the participants’ views of the intervention. To establish the effectiveness of motorcycle interventions, clear and measurable objectives should be set, with appropriate sample sizes and solid methodologies. In addition to participant feedback on the delivery of the intervention (which is important), established measures of behaviour, attitudes and knowledge should be utilised.
- 3 **A consistent message** – Whilst some partnership collaboration already exists, given the analysis highlighting the importing and exporting of P2W casualties, a consistent message across the

whole region is currently missing. There are existing brands used across partnership areas that could be expanded to the rest of the region to provide consistency or alternatively, brands could be retained but messages adapted to ensure that the same focus is delivered across the region.

Specific Recommendations

There are several recommendations which emerge from the process of synthesising and assessing the motorcycling interventions delivered in the East of England. There are also additional recommendations which were included in the casualty analysis²⁰ conducted to accompany this report. The recommendations are as follows:

- 1** Continue the use of assessment-based interventions, based on the evaluation results of the National BikeSafe scheme.
- 2** Ensure that post-test training schemes which follow riding assessments are all of high quality, are consistently delivered, demonstrate value for money and are available across the region.
- 3** Consider more refined targeting of some of the schemes to ensure that motorcyclists from the prominent casualty groups are the audience engaged with and that messages are tailored to their needs.
- 4** Consider a shift from targeting leisure riders to focusing on younger riders on smaller machines for some of the interventions.
- 5** Consider evaluating a sample of the following types of scheme, adopting a regional approach to achieve economies of scale. Clear objectives should be set to assess these interventions against. The schemes which should be evaluated are:
 - a** Magazines
 - b** Publicity campaigns
 - c** Young rider interventions
 - d** Biker Down
 - e** Events
- 6** Consider further collaboration as a region to:
 - a** Ensure best practice sharing
 - b** Look at economies of scale for similar interventions
 - c** Work with specific neighbours where importing and exporting of casualties is an issue
 - d** Share evaluation opportunities
- 7** Consider the creation and adoption of a universal brand that could be used to communicate with both motorcyclists and other road users about the vulnerability of motorcyclists across the whole region.

Additionally, the following recommendations were made in 'Powered-2-Wheelers in the Eastern Region':²¹

- a** Consider enforcement activity aimed at addressing driver distraction and poor manoeuvres by drivers and riders, concentrating on urban areas during afternoon commuting times.
- b** Consider a publicity campaign to encourage other vehicle drivers to look out for motorcycles, particularly at junctions.

²⁰ Cubbin (2017)

²¹ *ibid*,

- c** Consider a campaign to lobby for the introduction of a ‘vulnerable road users’ element to the driving test, requiring new drivers to demonstrate an understanding of how to fulfil their duty of care to vulnerable road users, including P2W riders.
- d** Consider a campaign aimed at normalising good practice for P2W riders when riding on busy urban roads, such as safe filtering/overtaking and avoiding rear end collisions with slowing traffic. The campaign media and content should be tailored to the main Mosaic Groups identified in the casualty analysis.
- e** Consider the installation of rear facing average speed cameras on routes identified in the collision analysis.
- f** Consider a campaign to increase participation in rider skills courses, focusing on road craft and hazard perception, using the main Mosaic Groups identified in the casualty analysis to help target engagement.
- g** Consider the creation and incentivisation of participation in road craft, bike handling and hazard perception training tailored to young riders.
- h** Consider the creation of publicity and engagement materials designed to appeal to young males, particularly those living in lower incomes areas.

Conclusions

All six of the partnership areas deliver or did deliver a range of motorcycle activities. There were 39 interventions submitted – with a quarter being ‘riding assessments’. Of the other interventions, 13% are events and 13% are websites or other publicity.

Most of the interventions offer advice, and over two-thirds are hoping to address attitudes.

Commuters are the main focus of the interventions, which corresponds to the casualty analysis. The next largest target group are leisure riders, but these are the smallest group of riders involved in collisions in the East. Conversely, young riders are a key casualty group but are the focus of the fewest interventions.

The casualty focus across the region differs: Cambridgeshire and Hertfordshire have commuters as their main casualty group; Bedfordshire has young riders and commuter riders as their casualty target groups; Suffolk and Norfolk have leisure riders and young riders; whilst Essex has commuters and other riders.

There is movement across the region with some districts ‘importing’ casualties from neighbouring authorities whilst other districts ‘export’ their residents who crash elsewhere. There are also districts where the casualties tend to be local residents.

The interventions were assessed to determine the casualty target groups and the focus of the message. The interventions were ‘scored’ according to the information provided and any evaluation that had been conducted.

There were five interventions which were rated as ‘best practice interventions’. These interventions were all related to advanced rider training, either as assessments and referrals or as actual training schemes.

There were 24 interventions which are worth considering but where extra evidence of efficacy would be useful. These interventions covered a wide range of activities, including training, awareness-raising, events, advice-giving and enforcement. Evaluations of some of these interventions could increase the rating level to best practice.

There were 10 interventions which were rated as having 'no evidence of best practice'. This is not to say that these interventions are ineffective or have unintended consequences, but that there were no evaluations and/or insufficient information showing how they were evidence-led. These interventions tend to be large scale publicity events, which can be difficult to evaluate as prior contact with the target audience is difficult to achieve.

There are opportunities to collaborate in the region, where similar interventions are being delivered in multiple areas. This does not necessarily mean there is duplication, but there could be opportunities for collaboration, sharing best practice and achieving economies of scale. Examples of opportunities include motorcycling safety magazines; assessment interventions; training courses, and first aid training. Collaboration could also take place between neighbouring partnership areas where there are importing and exporting of casualties.

A gap analysis identified that there should be a renewed focus on younger riders. Many of the interventions are not evaluation and this could be an area where the region works together to improve evidence around the effectiveness of schemes. Lastly, there are opportunities to provide a consistent message to both motorcyclists and drivers across the region.

Several recommendations were made, based on the review of the interventions and the assessing the casualty analysis. These recommendations include the opportunities for collaboration outlined above and filling the identified gaps.

Appendix A – Questionnaire



Motorcycling Road Safety Activity in the East of England

This questionnaire has been designed to capture information on road safety activities and interventions in the East of England which are targeted at improving motorcyclists' safety. The responses will be used to identify opportunities for collaboration in the region and where best practice could be shared.

Please complete one of these questionnaires for EACH motorcycling activity undertaken in your area.

Please pass to colleagues/partners to complete, where appropriate.

Please try to answer each question and state where the information is unavailable.

We appreciate your co-operation with this exercise.

1. PLEASE PROVIDE THE NAME AND / OR DESCRIPTION OF THE MOTORCYCLING ACTIVITY / INTERVENTION:

2. WHO IS THE LEAD DELIVERY PARTNER FOR THE ACTIVITY?

3. PLEASE LIST ALL THE OTHER PARTNERS WHO ARE INVOLVED IN DELIVERING THE ACTIVITY:

4. HOW MUCH DOES THE ACTIVITY COST TO DELIVER ANNUALLY? £

5. WHO FUNDS THE ACTIVITY?



Motorcycling Road Safety Activity in the East of England

6. PLEASE PROVIDE A BRIEF DESCRIPTION OF WHAT THE ACTIVITY INVOLVES:

7. IN WHICH YEAR WAS THE ACTIVITY FIRST DELIVERED? 2016

8. HAS IT BEEN DELIVERED EVERY YEAR SINCE THEN? YES / NO

9. IF IT HASN'T BEEN DELIVERED EVERY YEAR SINCE THEN, PLEASE EXPLAIN WHY NOT AND IN WHICH YEARS IT WAS DELIVERED:

10. HOW OFTEN IS IT DELIVERED EACH YEAR? Once / Twice / Monthly / Weekly/ Other

11. WHO IS THE TARGET AUDIENCE? (PARTICULAR AGE GROUP, TYPE OF RIDER ETC.)

12. HOW WAS THE TARGET AUDIENCE IDENTIFIED?

13. WHICH TARGET BEHAVIOURS ARE ADDRESSED BY THE ACTIVITY?



Motorcycling Road Safety Activity in the East of England

14. WHAT DOES THE ACTIVITY SEEK TO ACHIEVE?

15. HAS THE ACTIVITY BEEN EVALUATED/MEASURED FOR SUCCESS?

Yes / No

16. IF SO, HOW WAS IT EVALUATED?

17. BRIEFLY DESCRIBE THE MAIN RESULTS OF THE EVALUATION:

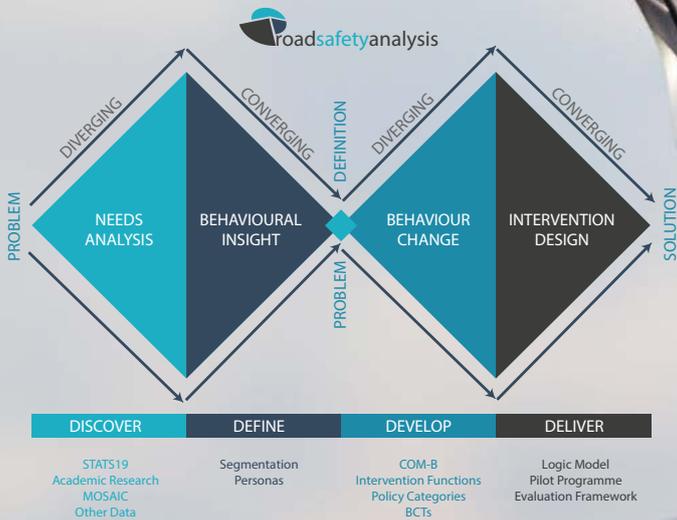
18. DID YOU LIAISE WITH LOCAL MOTORCYCLE GROUPS WHEN DESIGNING OR DELIVERING THE INTERVENTION?

Yes / No

19. IF YOU DO/DID WORK WITH MOTORCYCLE GROUPS, PLEASE DESCRIBE HOW YOU LIAISED WITH THEM:

HIGHWAYS ENGLAND EAST

Double Diamond workshop on young riders



Written by:

Road Safety Analysis

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Introduction

In July 2017, Highways England East commissioned two pieces of work: an extensive analysis of the injury collisions involving motorcyclists in the Eastern Region and a review of activities delivered in the East which seek to reduce the risk of motorcyclists. The conclusions of the two pieces of work were that:

- Whilst young motorcyclists represented a large percentage of those killed or seriously injured on the region's roads, there was a lack of focus on this group in the interventions;
- Interventions rarely included robust evaluations, and this was also the case for young rider evaluations;
- And there was a lack of a consistent regional message across motorcycle interventions.

In February 2018, a two-day 'Double Diamond' workshop took place to try to address some of these conclusions. With a focus on young riders, the workshop followed a process to use data and evidence to understand the problem and target audience and consequently, work through a behavioural diagnosis to determine how the problem might be addressed. The intention was to ensure that an evaluation plan was integral to the process and that there was an emphasis on identifying a regional solution to create consistency.

This report is a summary of the workshop and sets out the next steps for Highways England and its partners in the East.

Format of the workshop

The two-day workshop involved 10 selected representatives of local authorities, police and partnerships from the East of England as well as a representative of the motorcycle industry.

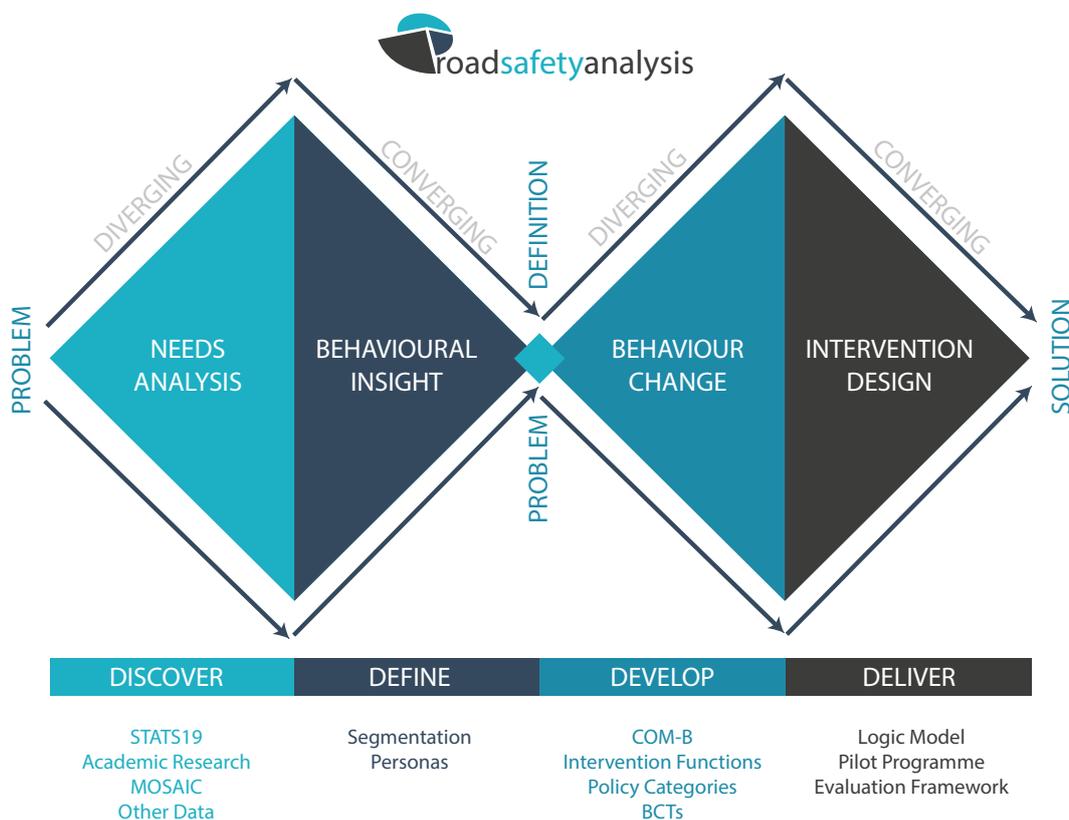
Dan Campsall	Road Safety Analysis (facilitator)	Iain Watson	Suffolk County Council
Tanya Fosdick	Road Safety Analysis (facilitator)	Sam Mason	Suffolk County Council
Lorraine Willis	Highways England (organiser)	Martin Andrew	Suffolk County Council
Simon Deards	Bedford Borough Council	Simon Burgin	Cambridgeshire Police
Matt Staton	Cambridgeshire County Council	Tim Oxley	Central Bedfordshire Council
Will Cubbin	Essex County Council	Karen Cole	Motorcycle Industry Association
Iain Temperton	Norfolk County Council		

The two days followed the ‘Double Diamond’ process, which sets out four stages:

- Discover – insight into the problem (a divergent stage to ensure that full insight is achieved)
- Define – the area to focus on (a convergent stage, refining and narrowing the focus)
- Develop – potential solutions (a divergent stage to ensure that all options are explored)
- Deliver – solutions that work (a convergent stage, refining and narrowing the focus).

In this workshop, the ‘define’ and ‘develop’ stages included working through the stages of the Behaviour Change Wheel (1), whilst ‘deliver’ included a focus on evaluation and measuring success.

Figure 1 Double Diamond process



Needs analysis

The needs analysis stage of the Double Diamond involved a review of the existing information related to young riders, to ensure that participants were fully familiar with the problems facing this target group and to discover who the target group are.

Collision analysis

A full analysis of the circumstances involved in collisions featuring motorcyclists, including young riders (16-25), in the East, is covered in the report (2) produced in 2016 and won't be repeated here. However, some of the main findings (and related insights) which were highlighted in the 'discover' phase are:

- Young riders in collisions are 90% male
- There is a seasonal effect with a peak in September (particularly amongst 16 and 18-year olds)
- Is this change related to the 2015 increase in education leaving age to 18 years old?
- 16 to 25-year olds have a 'flatter' seasonal effect than older riders – more dependent on mode? Work? (Older riders tend to be involved in crashes in the summer)
- Sales of mopeds have dropped in the last four to five years and there has been a migration to larger bikes (125cc). For example, moped PARC (number of vehicles currently licensed) has fallen from 166,500 in 2016 to 97,000 on 2015 (all sales, regardless of age). (3)
- Peak in 17-year olds
- 16 to 20-year olds are closer to home at the time of collision than older riders
- More deprived (based on IMD) – more likely to be at college, than sixth form (as colleges tend to be more vocational than sixth forms)
- Some 'rural' effect – no alternative modes of transport
- Majority are urban crashes and 48% of all collisions are at urban junctions
- Observation is an issue for motorcyclists AND other vehicles
- Behaviours and manoeuvres highlighted in the collision analysis include close following, filtering, right turns and roundabouts (failure to give way)
- 62% of the contributory factors were assigned to the motorcyclist and include 'failed to look properly', 'misjudged path/speed' and 'exceeding speed limit'

The analysis raised a number of questions/facts about these riders:

- Can we do anything about SMIDSY (Sorry, Mate I didn't see you)?
- There is low technology on smaller motorcycles (so fewer safety features)
- There is a perception that 'it's about progress' (using the motorcycle to get there as fast as possible)
- There are particular issues with group riding, including the complex dynamic of the group, the social context and risks associated with keeping up with a group
- That these riders do not perceive themselves as a 'motorcyclist'
- Perception that there is no need for them to invest in training – they will be drivers soon and the requirements of the CBT suggest training is unnecessary.

Mosaic insight

The postcodes of motorcyclists involved in injury collisions can be linked to socio-demographic data, including Mosaic Public Sector (4). This classification system can be used to understand the types

of communities our target audience come from. There were three Mosaic Groups which featured strongly in the collision analysis in the East:

- **Rural Reality (Group G):** Representing 17.8% of the young motorcyclists involved in collisions in the East, these communities include households where there is an over-representation of motorcycle ownership. They have low confidence in local police.
- **Family Basics (Group M):** Representing 15.8% of the young motorcyclists involved in collisions in the East, these communities are more deprived and have school aged children. They also have a low confidence in local police.
- **Aspiring Homemakers (Group H):** Representing 12.9% of the young motorcyclists involved in collisions in the East, these communities are younger families and are driven by 'affordability'.

Supporting evidence

A review of the existing literature linked back to the collision analysis. A summary of relevant literature was provided to participants in advance of the workshop and included evidence about:

- **Conspicuity**
 - The visibility of the rider, including clothing, light configurations, road positioning, speed. (5) (6) (7)
 - Driver perception, including looming, tracking and that there are four different types of failed to look (did not look; inadequate looking; adequate looking but did not see; and looked, saw, but failed to judge approach). (8) (9)
- **Behaviours**
 - Non-usage of protective clothing (beliefs about benefits) (10)
 - Social norms – especially speed (11)
 - Categorised as 'car aspirants', for whom limited information can make them significantly more risk-conscious, showing they have high educability (12)
 - Sensation seeking (13)

Lessons from other motorcycle interventions

A number of current or previous interventions were reviewed to understand their strengths, weaknesses, opportunities and threats (SWOT analysis). The table below summarises these.

Table 1 SWOT analysis of other motorcycle interventions

STRENGTHS	WEAKNESSES
● Benefit of incentivised scheme	● Inconsistent delivery
● Comprehensive training continuum	● Incentivisation? (requiring funding)
● Sensitised to risk	● Enabling environment
● Tailored approaches (local roads/delivery riders)	● Limited impact
● Appeal to BAME audience	● Parental understanding & engagement
● Engaging activity	● Evaluation
● Audience 'priming'	● Measurability
● Peer-led	● Isolating the right audience
● Segregated infrastructure	● Road conditions
	● Model for telematic insurance & scale of market

OPPORTUNITIES

- Post-CBT training – recruitment through trainers
- Trainers that ‘get it’
- Ability to ‘normalise’ training
- Motorcycle show attendees
- Selecting an appropriate delivery agent
- Social influencers
- Incentives for parents

THREATS

- Wider content/system – economy and education
- Financial & time ‘limit’
- ‘Culture’
- Sustainable in the system
- Alienation

There were a range of interventions which were discussed to arrive at the SWOT analysis above. These included:

- Training linked to Compulsory Basic Training (CBT)
- Social media campaigns
- Attendance at colleges
- Engineering (including bus lane access)
- Workplaces (incentives)
- Enforcement
- Wheels to Work
- Cycling initiatives
- Parental responsibility schemes

Behavioural insight

The ‘discover’ needs analysis provided an insight into who to target; which behaviours and issues feature in the collisions; and what the external factors influencing behaviours and success of interventions might be.

The next stage of the double diamond process is to start to refine and define the focus of any interventions. Participants were divided into groups to explore particular behaviours identified in the needs analysis. Using the Behaviour Change Wheel (1) as a guide, participants sought to define the problem in behavioural terms (what behaviour? Where does the behaviour occur? Who is involved in performing the behaviour?) and created a long list of candidate target behaviours which could bring about change. These candidate target behaviours were then prioritised¹ according to:

- How much impact changing the behaviour will have on the desired outcome?
- How likely is it that the behaviour can be changed?
- How likely is it that the behaviour will have a positive/negative impact on other behaviours?
- How easy will it be to measure the behaviour?

¹ The Behaviour Change Wheel asks that prioritisation is based on reaching one of the following decisions: 1) That the behaviour appears very promising as a target behaviour; 2) the behaviour is quite promising as a target behaviour; 3) the behaviour appears unpromising but is worth considering as a target behaviour; or 4) the behaviour is not acceptable as the target behaviour.

Table 2 *Prioritising behaviours related to making young riders more visible*

Overall desired outcome:	Make young riders more visible, especially at junctions			
Potential target behaviours	Impact of behaviour change	Likelihood of changing behaviour	Spillover score	Measurement score
Wear official high visibility clothing	Very promising	Unpromising but worth considering	Unpromising but worth considering	Very promising
Wear contrasting clothing	Promising	Promising	Unpromising but worth considering	Promising
Wear clothing with reflectivity	Very promising	Promising	Unpromising but worth considering	Promising
Improving road positioning to become more visible	Very promising	Promising	Very promising	Promising
Improve riders' understanding of the issues around visibility	Promising	Promising	Unpromising but worth considering	Promising
Improve lighting, including context	Promising	Unacceptable	Unacceptable	Very promising
Improve drivers' understanding of the issues around visibility	Very promising	Unpromising but worth considering	Promising	Unpromising but worth considering

Table 3 *Prioritising behaviours related to increase the use of protective equipment*

Overall desired outcome:	Increase the number of young riders wearing helmet, gloves, boots, jacket and trousers (personal protective equipment – PPE) when riding			
Potential target behaviours	Impact of behaviour change	Likelihood of changing behaviour	Spillover score	Measurement score
Use employers to make the wearing of PPE compulsory	Promising	Promising	Unpromising but worth considering	Promising
Elicit support from education establishments to encourage PPE wearing	Promising	Unpromising but worth considering	Unpromising but worth considering	Promising
Make PPE more attractive & at a lower cost (VAT issues)	Promising	Promising	Unpromising but worth considering	Promising
Educate parents to encourage them to buy PPE for their children	Unpromising but worth considering	Unpromising but worth considering	Promising	Unpromising but worth considering
Make young riders realise they are motorcyclists	Promising	Unpromising but worth considering	Promising	Unacceptable
Make young riders understand why PPE is so important	Promising	Unpromising but worth considering	Promising	Unacceptable
Identify alternative clothing items which protect but are not PPE	Promising	Unpromising but worth considering	Unpromising but worth considering	Unpromising but worth considering

Table 4 *Prioritising behaviours related to risk taking*

Overall desired outcome:	Reduce risk taking and increase responsibility amongst young riders, especially at urban junctions, in congested environments and on rural corners			
Potential target behaviours	Impact of behaviour change	Likelihood of changing behaviour	Spillover score	Measurement score
Encourage young riders to adopt slower speeds at junctions	Very promising	Unpromising but worth considering	Very promising	Unpromising but worth considering
Encourage young riders to ride defensively	Very promising	Promising	Very promising	Promising
Encourage improved hazard perception amongst young riders	Very promising	Promising	Very promising	Promising
Encourage young riders to aspire to 'good riding'	Promising	Unpromising but worth considering	Very promising	Unpromising but worth considering
Encourage young riders to seek training	Very promising	Promising	Very promising	Promising
Reduce opportunities for showing off by penalising negative behaviour	Promising	Unpromising but worth considering	Promising	Promising
Reduce opportunities for showing off by incentivising positive behaviour	Promising	Promising	Promising	Promising
Encourage young riders to use alternative modes	Very promising	Unpromising but worth considering	Promising	Promising

The prioritisation exercise facilitated a refinement of the potential target behaviours. Under broader headings, there were nine key target behaviours which were thought to have the greatest potential for positively impacting the key outcomes. The single word in brackets are used later in the process as an abbreviation.

- 1 Improve driver understanding of the needs and behaviours of young riders (drivers)
- 2 Encourage appropriate clothing to be worn, to improve both protection and visibility (clothing)
- 3 Improve rider positioning, particularly at junctions (positioning)
- 4 Improve rider understanding of their risk and the need to mitigate it (risks)
- 5 Reduce risk at junctions (junctions)
- 6 Improve speed choices, especially at junctions (speed)
- 7 Work with support structures (such as employers, education establishments, parents and peers) to tackle some of the other eight priorities (support)
- 8 Improve hazard perception skills of young riders (hazard)
- 9 Improve young rider attitudes towards training and the quality of available courses (training)

Behaviour change

The next part of the process was to understand these behaviours in more detail, determining who needs to perform the behaviour; what they have to do and when; where and how they need to do it; and with whom. This is another divergent stage, where all the opportunities are opened up, before refinement begins again.

Table 5 *Understanding the behaviour: understanding the needs and behaviours of young riders*

Target Behaviour	Improve driver understanding of the needs and behaviours of young riders
<i>Who</i> needs to perform the behaviour?	All road users
<i>What</i> do they need to do differently to achieve the desired outcome?	Understand limitations of visual perceptual performance and apply mitigation strategies
<i>When</i> do they need to do it?	Particularly at junctions (or on approach)
<i>Where</i> do they need to do it?	At junctions (or on approach)
<i>How often</i> do they need to do it?	Always
With <i>whom</i> do they need to do it?	All other road users

Table 6 *Understanding the behaviour: encouraging wearing appropriate clothing*

Target Behaviour	Encourage appropriate clothing to be worn, to improve both protection and visibility
<i>Who</i> needs to perform the behaviour?	Young riders and their parents
<i>What</i> do they need to do differently to achieve the desired outcome?	Wear high contrasting protective clothing that is better than what is currently worn
<i>When</i> do they need to do it?	At all times and especially at the point of bike purchase and licensing
<i>Where</i> do they need to do it?	At dealerships/retailers and when selecting CBT trainers, insurance, licensing
<i>How often</i> do they need to do it?	At all times whilst riding
With <i>whom</i> do they need to do it?	Parents

Table 7 *Understanding the behaviour: improving rider positioning*

Target Behaviour	Improve rider positioning, particularly at junctions
<i>Who</i> needs to perform the behaviour?	Young riders
<i>What</i> do they need to do differently to achieve the desired outcome?	Understand the need and benefit of better riding positions and know what to do as well as want to do it.
<i>When</i> do they need to do it?	Throughout every ride
<i>Where</i> do they need to do it?	Throughout every ride
<i>How often</i> do they need to do it?	Constantly so it becomes second nature
With <i>whom</i> do they need to do it?	Themselves and with peers

Table 8 *Understanding the behaviour: improving the understanding of riders*

Target Behaviour	Improve rider understanding of their risk and the need to mitigate it
<i>Who</i> needs to perform the behaviour?	Young riders
<i>What</i> do they need to do differently to achieve the desired outcome?	Engage with issues around their CBT and have an increased desire to embrace understanding
<i>When</i> do they need to do it?	At first point of riding and at point of choosing to ride
<i>Where</i> do they need to do it?	On their CBT or via NDORS
<i>How often</i> do they need to do it?	More than once
With <i>whom</i> do they need to do it?	Trainers/peers/mutual support/'model' riders

Table 9 *Understanding the behaviour: reducing junction risk*

Target Behaviour	Reduce risk at junctions
<i>Who</i> needs to perform the behaviour?	Planners and designers
<i>What</i> do they need to do differently to achieve the desired outcome?	Include an understanding of motorcyclists in the design process
<i>When</i> do they need to do it?	When designing schemes
<i>Where</i> do they need to do it?	When looking at existing infrastructure and building new schemes
<i>How often</i> do they need to do it?	Whenever designing/changing junction
With <i>whom</i> do they need to do it?	Developers, auditors, motorcycle and cycle experts

Table 10 *Understanding the behaviour: improving speed choices*

Target Behaviour	Improve speed choices, especially at junctions
<i>Who</i> needs to perform the behaviour?	Young riders (and all drivers)
<i>What</i> do they need to do differently to achieve the desired outcome?	Understand appropriate speeds and know what to do. Have the confidence to adopt the appropriate speed and what to do it.
<i>When</i> do they need to do it?	Throughout every ride
<i>Where</i> do they need to do it?	Throughout every ride
<i>How often</i> do they need to do it?	Constantly so it becomes second nature
With <i>whom</i> do they need to do it?	Themselves and with peers

Table 11 *Understanding the behaviour: working with support structures*

Target Behaviour	Work with support structures (such as employers, education establishments, parents and peers) to tackle some of the other eight priorities
<i>Who</i> needs to perform the behaviour?	Parents, friends and partners, educational establishments, employers, drivers and the young riders themselves
<i>What</i> do they need to do differently to achieve the desired outcome?	Understand the need and benefits of changing these behaviours and being prepared to be unpopular
<i>When</i> do they need to do it?	Start before the young person starts riding and continue afterwards
<i>Where</i> do they need to do it?	Various places, dependent on the structure stakeholder
<i>How often</i> do they need to do it?	Depends on the type of support and the needs of the rider
With <i>whom</i> do they need to do it?	Young riders

Table 12 *Understanding the behaviour: improving hazard perception*

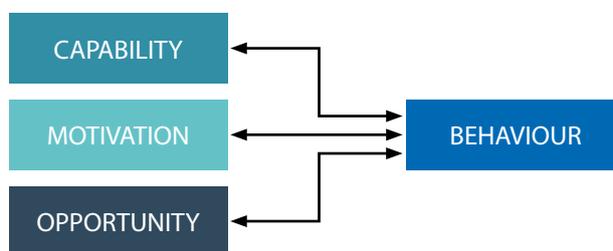
Target Behaviour	Improve hazard perception skills of young riders
<i>Who</i> needs to perform the behaviour?	Young riders
<i>What</i> do they need to do differently to achieve the desired outcome?	Better observation and planning
<i>When</i> do they need to do it?	All the time
<i>Where</i> do they need to do it?	On the road
<i>How often</i> do they need to do it?	Always
With <i>whom</i> do they need to do it?	Themselves

Table 13 *Understanding the behaviour: improving attitudes towards training*

Target Behaviour	Improve young rider attitudes towards training and the quality of available courses
<i>Who</i> needs to perform the behaviour?	Young riders, parents, employers, education
<i>What</i> do they need to do differently to achieve the desired outcome?	Pursue training
<i>When</i> do they need to do it?	Early in riding career
<i>Where</i> do they need to do it?	In a convenient way
<i>How often</i> do they need to do it?	Ongoing
With <i>whom</i> do they need to do it?	With competent, authoritative and credible trainers

Once the behaviours were explored in more detail, the next stage was to understand what could help the change occur. For this, the COM-B (1) model was used.

Figure 2 COM-B Model (1)



“The COM-B model is the starting point used by the Behaviour Change Wheel for understanding behaviour in the context in which it occurs. The central tenet of the model is that for any behaviour to occur:

- 1 There must be the ‘capability’ to do it: the person or people concerned must have the physical strength, knowledge, skills, stamina etc. to perform the behaviour;
- 2 There must be the ‘opportunity’ for the behaviour to occur in terms of a conducive physical and social environment: e.g. it must be physically accessible, affordable, socially acceptable and there must be sufficient time;
- 3 There must be sufficient strong ‘motivation’: i.e. they must be more highly motivated to do the behaviour at the relevant time than not to do the behaviour, or to engage in a competing behaviour.” (1)

All of the nine behaviours were reviewed to determine whether capability, opportunity or motivation needs to change in order for the desired outcome to be achieved. The Theoretical Domain Framework (TDF) was created to assist with the implementation of evidence-based theory, comprising of 15 domains linked to the COM-B model. (1) By using the TDF, it is easier to define which COM-B components need to change and why.

Table 14 Theoretical Domain Framework analysis

COM-B Components	TDF	Is there a need for change?
Physical capability	Physical skills	Improved search pattern (drivers) (hazard) More ‘active’ driving (drivers) (hazard) Riding appropriately (positioning)
Psychological capability	Knowledge	Knowledge around MC riding position (drivers) (hazard) Limitations in visual perception (drivers) (hazard) Knowledge around clothing choice (clothing) Understanding of what to do / how (positioning) (risks) (hazard) Being able to design for PTWs (junctions) Knowledge around appropriate speed (speed) Lack of understanding of what support is needed (support) Knowledge of what training will achieve (training)

Psychological capability (cont.d)	Cognitive and interpersonal skills	<p>Recognising presence & importance of PTWs (drivers)</p> <p>Justification of clothing choice (clothing)</p> <p>Justification of speed (speed)</p> <p>Hazard perception / Situational Awareness (hazard)</p> <p>Recognising importance of training (training)</p>
	Memory, attention and decision processes	<p>Attention & decision making (drivers)</p> <p>Deciding to wear (clothing)</p> <p>Dynamic decision making (positioning)</p> <p>Decision – speed choice (speed)</p> <p>Attention to limits (speed)</p> <p>Deciding to support (support)</p> <p>Recognising & responding to hazards (hazard)</p> <p>Decide training is a good idea (training)</p>
	Behavioural regulation	<p>Application of self-regulation / allowing space (drivers) (hazard)</p> <p>Application of self-regulation (clothing) (speed)</p> <p>Application of learned technique (positioning) (hazard)</p> <p>Confidence to take the position (positioning) (hazard)</p> <p>Confidence to select right speed (speed) (hazard)</p> <p>Legal / policy direction (support)</p> <p>Adherence to trained behaviours (training)</p>
Physical opportunity	Environmental context and resourcesWW	<p>In vehicle alerts, posters, route signage (drivers)</p> <p>Finance / cost implications (clothing) (support)</p> <p>Storage of kit at college (clothing)</p> <p>Clear signage (speed)</p> <p>Speed limiters (speed)</p> <p>Speed limiters (speed)</p> <p>Enabling access (support)</p> <p>Lining for bends (hazard)</p> <p>Helmet design (hazard)</p> <p>Hazard perception materials (hazard)</p> <p>Obstructions in the environment / foliage (hazard)</p> <p>Access to good quality / affordable training (training)</p>
Social opportunity	Social influences	<p>Role of media (?)</p> <p>Roles of bikers (drivers)</p> <p>Peer group pressure (clothing) (speed) (support) (training)</p> <p>Parental / employer (6) / education influence (clothing) (support) (training)</p> <p>Group riding (positioning) (speed)</p>

Reflective motivation	Professional/ social role and identity	Social role – positive prototypes (clothing) (speed) (support) (training) Acknowledgement you are 'part of traffic' (positioning) See themselves as a rider (risks)
	Beliefs about capabilities	Awareness of limitations (drivers) Self-efficacy (clothing) (positioning) (speed) (hazard) (training) Invulnerability (clothing) (speed) Supporters need to understand risks (support)
	Optimism	Rarity of the event (drivers) (support) Unlikely to get caught (speed) Improve your riding (training)
	Beliefs about consequences	'They deserve what they get' (drivers) Unclear on benefits (clothing) (positioning) (hazard) (training) Beliefs of risks (risks) (support) Won't get hurt anyway (speed) (training) Cheaper insurance (training)
	Intentions	Consciously looking for MCs (drivers) They need to intend to wear (clothing) They need to intend to ride appropriately (positioning) Intend to utilise skills / knowledge (risks) (speed) (hazard) Intend to support (not abandon) (support)
	Goals	Purchase of kit as part of goal of riding (clothing) (support) Avoiding a ticket (speed) Keeping up with traffic (speed) Keeping YR safe (support) Developing Hazard Perception skills (hazard) Developing rider skills (training)
Automatic motivation	Reinforcement	Social reinforcement / peer reaction (clothing) (speed) Telematics feedback (positioning) (speed)
	Emotion	Embarrassment/peer pressure (clothing) (training) Satisfaction of making progress (positioning) (speed) Super-hero effect (speed) (training) Caring for social circle (support) (training)

The TDF diagnosis shows that there is a need for change across a range of domains. The table below shows how the need for is mapped across the COM-B components for the nine behaviours.

Table 15 COM-B and target behaviours

Target Behaviours	Physical Capability	Psychological Capability	Physical Opportunity	Social Opportunity	Automatic Motivation	Reflective Motivation
Improve driver understanding of the needs and behaviours of young riders	✓	✓	✓	✓		✓
Encourage appropriate clothing to be worn, to improve both protection and visibility		✓	✓	✓	✓	✓
Improve rider positioning, particularly at junctions	✓	✓		✓	✓	✓
Improve rider understanding of their risk and the need to mitigate it		✓				✓
Reduce risk at junctions		✓				
Improve speed choices, especially at junctions		✓	✓	✓	✓	✓
Work with support structures (such as employers, education establishments, parents and peers) to tackle some of the other eight priorities		✓	✓	✓	✓	✓
Improve hazard perception skills of young riders	✓	✓	✓			✓
Improve young rider attitudes towards training and the quality of available courses		✓	✓	✓	✓	✓

Now that there is an understanding of what needs to change and what the target behavioural outcomes are, the next stage is to identify how best to facilitate that change happening. Intervention functions are “broad categories of means by which an intervention can change behaviour.” (1)

The following table shows how the COM-B components can be used under different intervention functions.

Table 16 Intervention functions and COM-B components (1)

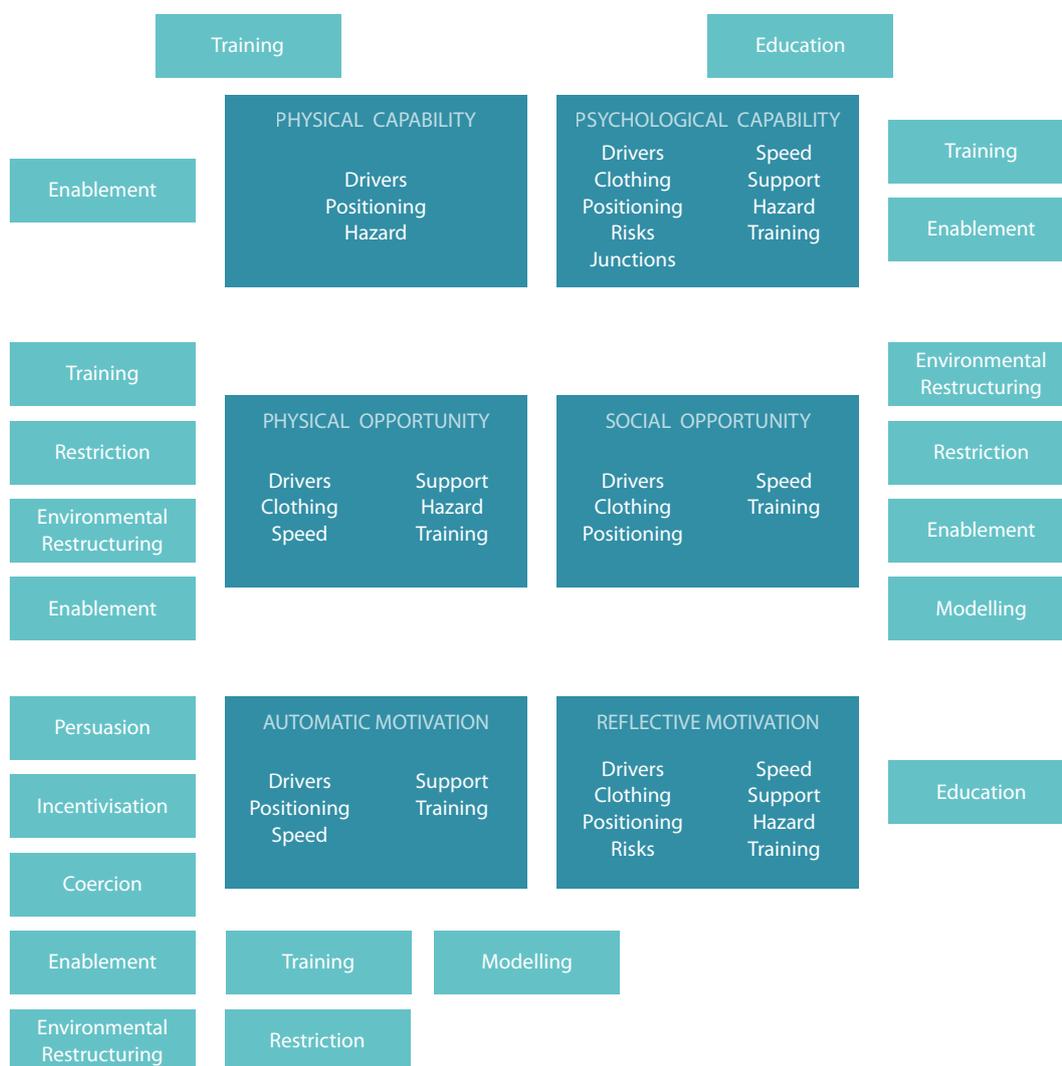
COM-B Components	Intervention Functions								
	Education	Persuasion	Incentivisation	Coercion	Training	Restriction	Environmental Restructuring	Modelling	Enablement
Physical Capability									
Psychological Capability									
Physical Opportunity									
Social Opportunity									
Automatic Motivation									
Reflective Motivation									

The following diagram brings together the intervention functions, the COM-B components and our target behaviours to show where the opportunities to change are. It shows that there are many different ways in which ‘automatic motivation’ can be influenced and that this can be used to change five of our nine behaviours. Both physical and social opportunity can be addressed through four different intervention functions and that these both address at least five of the nine behaviours.

The diagram also raises some questions about the natural instinct to default to education in road safety behaviour change. Whilst reflective motivation could be the relevant component to address eight of the different behaviours, education itself is only relevant for two of the six COM-B components. It might suggest that in order to change some of these behaviours, education should be used in conjunction with some of the other intervention functions.

This stage of the workshop opened up all of the possible routes for intervention design. The next stage is to refine them.

Figure 3 Target behaviours, COM-B components and intervention functions



Intervention design

Bringing together all of the evidence and data; the behaviours and COM-B components; and an understanding of which intervention functions might be most effective to target the prioritised behaviours, the final session of the Double Diamond started to explore what could be achieved.

It was decided that there were two main routes to effect change amongst young riders: through engagement with them and through engagement with their support structures.

Support structures

The process identified that there were a number of ways in which support structures (such as employers, educational establishments and parents) could help to address the target behaviours (through target behaviour 7: Work with support structures to tackle some of the other seven priorities (support)):

- 2 Encourage appropriate clothing to be worn, to improve both protection and visibility (clothing)
- 3 Improve rider positioning, particularly at junctions (positioning)

- 4 Improve rider understanding of their risk and the need to mitigate it (risks)
- 5 Reduce risk at junctions (junctions)
- 6 Improve speed choices, especially at junctions (speed)
- 8 Improve hazard perception skills of young riders (hazard)
- 9 Improve young rider attitudes towards training and the quality of available courses (training)

There were a number of intervention functions that were thought to be most appropriate to work with support structures:

- Persuasion
- Incentivisation
- Modelling
- Enablement
- Coercion

For employers, there were a few different routes to supporting their young riders. They could be incentivised to support safer practice amongst their employees through the provision of appropriate clothing (and storage for it) as well as insurance and enhanced training. They could be encouraged to enable change through the use of workforce management tools. Employers could be coerced through Health and Safety regulation and monitoring or through enforcement of insurance checks. Modelling, through schemes like Driving for Better Business (DfBB), could show them how supporting their young riders could help them to reduce costs.

In educational establishments, it was felt necessary to identify and persuade the 'right person' to participate in supporting young riders. Educational organisations could be enabled to support through travel planning schemes, reduced parking congestion and permit schemes. There could be incentivisation initiatives such as 'Wheels to College', which would provide training, a permit scheme, equipment, clothing and free maintenance. Modelling could be undertaken through a lead institution who sets an example to others.

There were several ways to work with parents to encourage them to support their young riders. Enablement could be used to provide an understanding of what is required to keep their children safe, in terms of training, licensing and protective kit. Modelling could be used here as well through the use of parent advocates (using channels such as 'Mums Net') to provide good examples. It could be stressed that 'better bikers make better drivers'. Enablement could also incorporate the use of parental contracts, where there is an agreement between parent and rider about the use of their motorcycle, based on time, destination and behaviour. Incentivisation could also be used, such as 'cashbacks' and insurance discounts. As parents will be financially supporting young riders and that the Mosaic analysis showed that many are from deprived communities, cost reductions could be key.

Combining these support structures, it was felt that the greatest traction could be gained through focusing on educational establishments, with a parental element. At the point of starting college, it could provide parents with support information. Permits, linked to minimum requirements of training and equipment, could be provided for cars and bikes. This could be linked to travel planning support from local authorities. A Wheels to College scheme would be a strong mechanism for ensuring training was undertaken and appropriate equipment used. There could be opportunities for retailer involvement and using 'shiny things' to incentivise student participation.

Young Riders

The process identified that there were two main activities that young riders could undertake that would reduce their risk. These were:

- To encourage them to undergo training, addressing the following target behaviours:
 - 7 Encourage appropriate clothing to be worn, to improve both protection and visibility (clothing)
 - 8 Improve rider positioning, particularly at junctions (positioning)
 - 9 Improve rider understanding of their risk and the need to mitigate it (risks)
 - 10 Reduce risk at junctions (junctions)
 - 11 Improve speed choices, especially at junctions (speed)
 - 12 Work with support structures (such as employers, education establishments, parents and peers) to tackle some of the other eight priorities (support)
 - 13 Improve hazard perception skills of young riders (hazard)
 - 14 Improve young rider attitudes towards training and the quality of available courses (training)
- To encourage them to wear appropriate clothing, addressing the following target behaviours:
 - 2 Encourage appropriate clothing to be worn, to improve both protection and visibility (clothing)
 - 7 Work with support structures (such as employers, education establishments, parents and peers) to tackle some of the other eight priorities (support)

There were a number of intervention functions that were thought to be most appropriate to address these two behaviours:

- Education
- Persuasion
- Incentivisation
- Modelling
- Enablement

It was felt that social norms should be a key part of any intervention and that a credible source should be used to share information and influence these social norms. There was scope to provide freebies or incentivise them to attend (either the interventions or focus groups, discussed below). The sessions would allow them to talk through the behaviours in open discussions with peers who are both riders and non-riders (to understand the influences of those outside of motorcycling). The purpose would be to discuss the key issues of training and clothing and offer each other advice. There would be a requirement to maintain informality and use the social status of participants and external 'others' to influence thinking.

The Double Diamond process identified some major gaps in knowledge regarding the target behaviours:

- What are the current levels of protective clothing wearing and training uptake?
- What would get young riders to turn up to an intervention?
- What would get young riders to change and start wearing clothing and undergo training?

It suggests that there is some work to be undertaken to answer these questions and that focus groups might be an appropriate way to do that. There is a question about how to get them to turn up and participate in a focus group, and incentivisation may play a part here.

Feedback on approach

Of the 10 participants, seven had provided comprehensive feedback on the approach by the time of writing (27/03/18). As this was a novel approach to understanding a road safety user problem and working through how it could be addressed, it was important to capture the thoughts of participants on the process itself.

Expectations of what the two days would involve differed. Many of the participants reported that it evolved as expected and these were individuals who were more familiar with the concept of the Behaviour Change Wheel. For others, the process was very different to what they expected:

"I expected to arrive and discuss options we have tried for years and look for new approaches to these ideas." Did your expectations differ from reality? "Yes, it was a totally different way of problem solving without jumping ahead at each stage."

What did you expect to happen on a two-day workshop about young riders? *"A lot of talk but no real conclusions to a 'problem' that's resisted all efforts to resolve in the past." Did your expectations differ from reality? "No 'golden bullet' but a promise that new ideas can be followed. Hopefully a realistic view that might lead to new approaches."*

Getting domain experts in the same room for two days to work through the issues facing young riders was thought to be a good idea:

"Yes, the fact that you had well informed people with knowledge of different aspects of the issue worked well. It helped stress-test any ideas quickly and efficiently, so that any ideas with consensus should have a good chance of working."

"I think it was invaluable to have everyone in a room and the structure of breaking off then coming back together and breaking off again worked well. I think two days proved to be ambitious for a target audience that has always proved challenging to develop interventions for and the breadth of the issue. However, I think the process was really good (and challenging). The most important part being that they process was started with no preconceived ideas of what the end point would look like. There was temptation throughout to 'jump ahead' to solutions but it was testament to the people in the room that the process was followed as religiously as it was. With a less disciplined and committed group I think this would have been very challenging!"

"As with so many road safety interventions, many practitioners believe they are an expert. What was great about this was the spread of expertise and experience around the room with everyone happy to contribute positively."

"I think the idea of bringing individuals described as 'domain experts' into a workshop was a good idea and the benefit was enhanced by having a younger male colleague involved too. Occasionally, experts can have quite fixed mindsets so having a younger colleague involved was great as a calibration mechanism and indeed, the workshop environment created by the COM-B and Double Diamond methodology was disruptive to fixed mindsets, so it kept the group in an open-minded space that limited scope to jump to conclusions. I'd love to know how the exercise would run if we had more young riders involved and a broader mix of stakeholders from the wider 'system'. The system being key stakeholders including practicing trainers of different backgrounds, the DVSA, DfT, insurers. ... A mix of perspectives and interests, which might draw out some of the more fundamental limiting factors within the system as a whole, including dilemmas, assumptions etc."

Aside from the individuals in the quote above, it was generally felt that it would have been useful to have at least one young rider involved (rather than a young person who doesn't motorcycle) and other suggestions for people who could have been involved were:

- Trauma surgeon
- Youth engagement experts
- Behavioural psychologist

Participants were asked whether they thought the Double Diamond process in general was a useful one and a common theme emerged about not being specific enough about defining one behaviour. This should be considered in future Double Diamond workshops:

"I think the group thoroughly tested the process and hopefully this provided useful feedback for some minor refinements to what was a very useful framework. For the most part it worked well, but I feel we were struggling to find focus on the second afternoon because the behaviour-problem hadn't been defined specifically enough at the end of day 1...I think the focus on one very specific behaviour is the only thing we really lacked."

"I think the double diamond process is very useful, and particularly like the way it was dovetailed with the behaviour change wheel process. I think where we fell down though is that we tried to carry too many 'defined problems' through to the second diamond. I think this is partly down to the complexity of the issue related to young drivers and it would be interesting to apply exactly the same process, in the same format to a simpler issue."

"It kept us focused and prevented the group from disappearing off into the usual arguments and stalemate."

All participants agreed that it was really important to spend the first part of the workshop reviewing the data, so all understood the problem fully. One suggestion to streamline this part of the process was that a smaller group of specialist data and research participants undertook to synthesise the evidence and literature prior to the workshop and then present it back in the first session with an opportunity for other participants to challenge and discuss the findings.

Participants were asked about how useful they thought the Behaviour Change Wheel process and the COM-B model were as the middle sections of the Double Diamond. It was found to be useful, but some participants felt that it would have been useful to have prior knowledge of the process, as time was lost in 'training'. It was also thought that other models could be considered or that the reason for picking the BCW should have been clearly demonstrated.

"The COM-B section was a little... clunky? Again, I can see the value in the outcome but wonder if there might have been a slightly more efficient way to get there."

"I do think the process was useful, yes. The fact they we were experimenting made it even more valuable as we had to adapt our understanding as we went, and this aided joint exploration and dialogue. We knew it was an experiment in applying the methodology to the subject area. At certain points there was some confusion and questions about how best to align the method with the content of the issue, but this really only served to get us all thinking a little more and refining our own understanding of the problem space."

The process wasn't completed in full, because of lack of time. Participants were asked what could have been changed in order to give more time to the final part of the Double Diamond. It was suggested that focusing on one very specific behaviour would have provided more time and made the process easier. Others felt that three days were required as concentrating on timekeeping would have meant affecting lots of useful discussions.

"Add another day :) But also as said above do a comprehensive evidence review as prep and maybe ensure people understand the importance of reviewing this individually to have a short discussion at the beginning around the evidence rather than half a day on it at the beginning."

Regardless of this, all respondents felt that the process was useful and that there shouldn't be a focus on the time taken to complete it.

"I don't feel that any of session time was wasted. I appreciate that time is precious, but to get the correct result it would be worth more time spent even one more day would have made a real difference. With notice this could be planned in."

Participants were asked what they had learnt over the two days, if anything:

- How the Double Diamond process works
- Other young rider interventions used in other areas
- Retail insight
- How some interventions are perceived by young people
- Different ways of looking at problems
- Challenges of putting these processes into practice
- The importance of different roles for road safety practitioners (design and delivery are different)
- There is no magic bullet
- Traditional approaches may have some relevance but are limited in effect
- Hope that workable new approaches may just be around the corner
- There's a great deal of expertise out there
- The complexity of interdependencies associated with the core issue of young rider vulnerability in a road safety context

Participants were asked what they would change about the process that was followed. Suggestions included a clearer focus on one specific behaviour; a less complex topic to try again to see if the same or different challenges occur; gathering the opinions of young motorcyclists to keep the group focused; some background work to draw out which specific problems existing interventions are seeking to address; and more of an understanding that this particular user group is less of a defined group than others.

Participants were asked what they felt worked about the process:

"I liked how we could explore a few tangents but not waste loads of time getting side tracked from the agenda. The double diamond worked well because it allowed us to explore a range of ideas without losing focus in the long run."

"The fact it was a clearly defined process. Not everyone's cup of tea I know, but it really served to ensure we didn't jump ahead to solutions and you could see the purpose for each step along the way."

"The willingness of the delegates to share experiences and expertise."

"The Double Diamond process kept us focussed on a conclusion. It could easily have become just another talking shop. I feel something was achieved here. . . . just not quite sure what yet. :)"

"The venue worked, the size of the group was about right I think but could work with a few more participants I feel. The process is quite clear and rigid, it is just the subject that tested the boundaries of the process. It worked because we had a strong well facilitated dialogic process of communication."

"Being able to focus on specific behavioural issues was useful, weeding out the unnecessary stuff to focus on the real problem is invaluable."

"It took us away from just following the things we have tried for year that clearly are not working. I am now looking to different interventions and approaches."

Finally, participants were asked if the same process could be replicated in other regions and for other topics and if so, what should be taken into account before replicating it elsewhere. It was felt that it could be replicated if the following were adopted:

- Right mix of people/expertise and research/design/delivery
- Good information resources prepared in advance/available evidence base for topic
- Two-day format to allow offline chats
- Focus on one clearly defined issue
- Think about the complexity of the issue
- Include representatives from the 'problem group'
- Better established user groups

It was also suggested that this group should finish the process and review all the work again together. This takes the feedback onto the next steps and actions.

Next steps and actions

There are a number of actions to be taken as the next steps in this process:

- Undertake focus groups to answer some of the key questions about current behaviour and what would facilitate engagement by young riders
- Engage with educational establishments to identify those who could operate as a 'lead' and trial organisation
- Explore how a Wheels to College scheme could be established, funded and maintained
- Design pilot interventions with young riders and support structures
- Identify and code behaviour change techniques in the pilot interventions
- Undergo evaluation training and design appropriate evaluations for the pilots
- Link this work across to the existing Compulsory Basic Training (CBT) pilot that is being conducted in the East. Use the understanding of the behaviour issues and challenges from this workshop to inform the package for an enhanced CBT
- Working with employers through Riding for Better Business as an extension of DfBB and use the learnings from the workshop to inform the development of Riding for Better Business to add value

Conclusions

This process involved two intense but productive days of working through the identification of the problem through to identification of potential solutions.

The needs analysis meant that we had a clear understanding of who the target audience are and why they might be using a motorcycle. All year-round collision involvement suggests that motorcycles are their main form of transport for college and work and that they need to ride, rather than necessarily wanting to. Economic pressures could influence their access to training and the use of appropriate equipment, reflected in the evidence review where protective clothing, training and improving their visibility, especially at junctions is key. A review of previous interventions found that impact can be limited, and evaluations have not been undertaken. Successful interventions have been peer-led and incorporated engaging activities.

The behavioural insight stage involved the identification of target behaviours, reflecting the needs analysis. The process involved understanding which behaviours were most promising in terms of

achieving change, influencing other behaviours and being measurable. There were nine target behaviours identified, ranging from improving road positioning and the wearing of appropriate clothing through to raising awareness amongst drivers and using support structures to influence young rider behaviour.

The behaviour change stage used the Behaviour Change Wheel and COM-B to understand what needs to change and for how for the nine target behaviours. The process identified the intervention functions which could be employed in an intervention.

The final stage of the workshop started to map out two pilot interventions, both using educational establishments, with one targeting young riders and the other working with support structures. It was felt that these were the easiest routes to accessing the target audiences. The proposals were new approaches to interventions, using the data and behavioural diagnoses but involve collecting some information before proceeding.

The next steps, therefore, are to collect information on baseline behaviours and understand what would motivate young riders to change. There are a number of exploratory exercises to undertake before commencing design of pilots and evaluations needs to be planned. The first 'next step' is to establish ownership of these actions by the various partners.

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HIGHWAYS ENGLAND EAST

RIDEFREE

Trial findings



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Road Safety Analysis

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Executive summary

The six-month trial of 'RideFree', a randomised controlled trial of four versions of Compulsory Basic Training (CBT) for young novice riders, is actually the culmination of two years' of work in the East of England by Highways England and partners. The process was evidence-led, starting with needs analyses of delivered interventions and collision data to understand who should be targeted and how; and culminating in behaviour change workshops and the design of new training syllabuses and a small-scale trial. A partnership approach was adopted, incorporating road safety stakeholders, academics and researchers, industry experts and Government organisations.

The trial itself produced new insights into what adaptations to CBT might work for the at-risk group of young, novice riders. Four versions of CBT were tested: the standard CBT (control); a novice only version of the standard CBT; an enhanced version incorporating eLearning and additional attitudinal and behavioural elements in the syllabus; and a two-day enhanced syllabus, which includes a stronger behavioural and attitudinal focus on specific risk-related elements and more time for on-road riding.

Data were collected in the trial from a variety of sources: participant questionnaires, trainer feedback forms, trainer interviews and eLearning results. The data provided a mix of qualitative and quantitative information, on both the outcomes of the trial and the process of delivery.

There were lessons to be learnt from the recruitment process, with trainer availability, weather and suspicion over free training potentially all playing a part. However, the achieved sample of participants reflected the at-risk target group in terms of age, gender, motorcycling experience and Mosaic background.

The two-day CBT was well-received by participants, who seemed to appreciate the extra time provided in the training, making them feel more confident. There were more barriers identified to the implementation of this form of training, though, including the need to pay for two days' of CBT; how to determine in advance which students would benefit from two days; and logistical issues with running different types of CBT at the same site on the same day.

The enhanced CBT with eLearning looks more promising. Trainers provided positive feedback for these participants, suggesting it was more akin to having students who were car drivers. The students were more responsive and had a better understanding of the Highway Code, the importance of regular vehicle checks and issues of visibility and vulnerability. These participants were the least confident after their CBT, perhaps reflecting the eLearning modules which highlighted the need to gain more on-road experience. Reducing over-confidence can have a positive road safety benefit. The enhanced CBT participants demonstrated learning not observed across the other groups, with increases in knowledge about factors which affect riding; the importance of motorcycle maintenance; and improvements in attitudinal statements. However, there was a set of questions about social norms which needs to be explored in more detail. It could be that participants are now more aware of the knowledge deficits of other young riders (a positive finding) or alternatively, it could have been that negative behaviours have been normalised.

It should be remembered that the achieved sample sizes were not large enough to conduct statistical tests. However, the findings were consistent across the various data sources.

There are a number of suggestions to be considered when taking the recommended next steps. These include understanding how best to roll out an enhanced version of CBT, using parents, training bodies, road safety stakeholders and social media. The two enhanced syllabuses should be revisited in light of the findings to make relevant changes. There are also some practical changes required to the software tools used to deliver the eLearning and enhanced syllabuses.

Next steps

There are a number of immediate next steps which should be followed before roll-out of any of the versions of CBT explored in this trial.

- 1 For DVSA to review the findings in this report, along with MCI and Highways England to consider endorsing wider roll-out of any of the versions.
- 2 For the greatest focus to be on the enhanced CBT with eLearning as the version with the greatest potential to have a positive effect and to be practically delivered
- 3 To revisit the content of the eLearning modules to provide clarity on specific topics and ensure that negative behaviours are in no way normalised
- 4 To revisit the content of the enhanced syllabus to provide additional content on specific topics and ensure trainers are testing the eLearning knowledge in the CBT
- 5 To produce a training pack for ATBs for the enhanced version, perhaps with a training video online, accessible via a secure area of the RideFree website
- 6 To consider funding options for the software and syllabus changes that would be required before the enhanced version of CBT is offered more widely
- 7 To explore the creation of an ATB support community to share best practice and provide opportunities for better engagement with road safety stakeholders
- 8 To devise a clear marketing strategy for the enhanced version, with support from DVSA, to encourage take up. Promotion to students could highlight that they are less likely to need two days to complete CBT; to ATBs that the students will be more responsive, and the CBT will flow better; and to parents, that their child will be better equipped to ride safely.

History of RideFree

In July 2017, Highways England East commissioned two pieces of work: an extensive analysis of the injury collisions involving motorcyclists in the Eastern Region and a review of activities delivered in the East which seek to reduce the risk of motorcyclists. The conclusions of the two pieces of work were that:

- Whilst young motorcyclists represented a large percentage of those killed or seriously injured on the region's roads, there was a lack of focus on this group in the interventions;
- Interventions rarely included robust evaluations, and this was also the case for young rider evaluations;
- And there was a lack of a consistent regional message across motorcycle interventions.

In February 2018, a two-day 'Double Diamond' workshop took place to try to address some of these conclusions. With a focus on young riders, the workshop followed a process to use data and evidence to understand the problem and target audience and consequently, work through a behavioural diagnosis to determine how the problem might be addressed. The intention was to ensure that an evaluation plan was integral to the process and that there was an emphasis on identifying a regional solution to create consistency.

The Double Diamond identified a number of key target behaviours that were likely to reduce risk for young riders and that the Compulsory Basic Training (CBT) provided the greatest opportunity for engaging with the target audience around these behaviours.

The process of reviewing existing interventions; undertaking collision analysis; and working through the Double Diamond process led to the creation of the RideFree project.

Why enhance the CBT?

The Double Diamond workshop highlighted a number of young rider behaviours which, if changed, could reduce their collision risk.

For young riders, the behaviours were:

- Wearing appropriate clothing to improve protection and conspicuity
- Improved rider positioning, especially at junctions
- Improved rider understanding of risk
- Improved speed choices, especially at junctions
- Improved hazard perception skills
- Improved young rider attitudes towards training

Participants discussed ways in which to interact with young riders in order to change behaviours and other successful interventions were reviewed. Not all young people choose to ride a motorcycle so accessing them can be difficult; it is not as easy as attending a school or college and speaking to a year group where most will soon be learning to drive.

The CBT syllabus itself follows a set order of elements, as a legal requirement. There is already enough material to cover two days within CBT (which is usually delivered in one), meaning the current training is full, limiting the options to add additional elements or provide more time to cover the identified behaviours. Most students complete CBT in one day, but it can be challenging, especially for young novices.

A meeting in October 2017 between Highways England and other stakeholders identified a number of issues with CBT:

- There are over 200 CBT providers in the East region, with differing levels of competence.
- There are recognised issues with facilities and standards provided by some CBT providers.
- The current one-day CBT course is delivered in different ways across CBT providers, with some providing a full day of training and assessment and others only lasting a few hours.
- There is variation in the quality of information being taught to CBT attendees.
- The main aim of people attending the CBT is to “get it over with” as quickly as possible to allow them to legally use their bikes on the roads.
- As the CBT is compulsory, the main draw for riders is the cheapest option and not necessarily the quality of the course content or training skills of the instructor.
- There are lessons which could be learnt from a similar approach by TfL, who were delivering a 2-day CBT

To include more training on the specified behaviours, the CBT would either need to be altered to find more time in the one day (through the provision of pre-learning) or by adding additional time (through delivering CBT over two days).

Designing enhanced CBT

The project team for RideFree consisted of a number of local and national stakeholders:

- Highways England (project sponsor)
- Driving Research Ltd. (behavioural insight and enhanced syllabus design)
- Road Safety Analysis (trial administration and evaluation)
- Driver and Vehicle Standards Agency (syllabus approval)
- Motorcycle Industry Association (content advice and trainer recommendations)
- Bedford Borough Council (partner authority)
- Safer Roads Essex (partner authority)
- Cambridgeshire County Council (partner authority)
- Norfolk County Council (partner authority)
- Suffolk County Council (partner authority)
- Central Bedfordshire Council (partner authority)
- Southend on Sea Borough Council (partner authority)
- Hertfordshire County Council (partner authority)
- BCH Road Policing Unit (partner authority)

A design meeting took place in June 2018, involving Dr Julie Gandolfi from Driving Research Ltd.; the Assistant Chief Driving Examiner from the Driving Vehicle Standards Agency (DVSA) with responsibility for motorcycle rider polices; Training and Safety Director of the Motorcycle Industry Association (MCIA); Highways England Road Safety Co-Ordinator for the East of England; and representatives from several local authorities.

Working together, the group defined the target audience and the types of course to be included in the trial. The content for the enhanced versions of CBT were agreed, including the amounts of time to be spent on new additions to the existing statutory elements.

The four types of course to be offered were:

Standard CBT

- Control group of standard CBT students
- Mixed groups – no stratification by age or experience
- Questionnaires pre and post administered to young novice riders only

Young novice CBT

- Standard CBT syllabus
- 16 to 24-year olds only
- Novice riders

Enhanced CBT

- Pre-eLearning module, containing hazard perception and content related to the Highway Code, safety equipment, risky behaviours and positive attitudes
- Adjusted course content introducing attitudinal and behavioural elements to the existing syllabus
- Split ride out
- 16 to 24-year olds only
- Novice riders

Two-Day CBT

- Two-day enhanced CBT, with fully integrated behavioural and attitudinal elements
- Split ride out
- Enhanced syllabus to include additional clothing information and an introduction to attitudes and behaviour in Element A and a strong behavioural focus in Element D2, including fatigue, distraction, peer pressure, time pressure and confrontation
- 16 to 24-year olds only
- Novice riders

Dr Julie Gandolfi created new syllabuses for the two enhanced versions of CBT and designed the eLearning modules, based on the agreed content. The eLearning modules were built into an online eLearning resource by Road Safety Analysis. The new syllabuses were designed so they were easy to follow for trainers and guides were produced, which trainers could use as they were delivering the training.

Trial methodology

The evaluation was designed and delivered by Road Safety Analysis, using a randomised controlled trial design.

The aim was to achieve a target sample of 128 participants across the four CBT groups. The purpose of the trial was to determine if enhanced versions of CBT improved the knowledge, attitudes and intended behaviour of participants. It was also designed to capture information on the process of delivering enhanced CBT, in order to identify any barriers to roll out.

Data were collected in a number of ways:

- Pre and post questionnaires completed by participants covering:
 - Experience and demographic information
 - Willingness to engage in risky behaviours
 - Fact-based questions about safe riding
 - Attitudinal questions adapted from the Rider Attitude Questionnaire
 - Feedback on content and length of the CBT they took (post-only)
- Trainer feedback questionnaires completed for each student
- Trainer telephone interviews at the end of the project to understand barriers and opportunities for CBT
- eLearning data

Trainers in the East of England were identified through the MCIA, DVSA alerts and road safety partnerships, selecting those with a reputation for high quality delivery. Whilst this does not give a true picture of how the enhanced versions might be delivered by all trainers, it was decided that to test the potential of these new versions, the best trainers were needed to deliver it properly. Fifteen training schools were recruited, and trainers interested in participating in the trial were taught the new syllabuses by Dr Julie Gandolfi in 'train the trainer' days.

The trial was named 'RideFree' and branding created to appeal to the target audience. A bespoke website and booking database was created to deal with registrations and to process participants throughout the trial. Online surveys were created in a separate platform and eLearning modules were linked to the booking system.

It was decided that to encourage participation, the CBT needed to be free for participants, but a deposit was required to provide an incentive to complete the trial. Each participant paid a £25 at the time of booking a CBT through RideFree, with the deposit returned on the successful completion of the trial. The normal cost of the CBT was paid directly to trainers through RideFree.

Available dates were supplied by trainers, providing pairs of dates, one week apart. Each date was randomly assigned to one of the four course types. Participants would not know at the time of booking which course type they would be attending and were signing up to attend both dates. Once booking was confirmed, they would be told whether they were required for the second date or not. Participants were not told about the different types of CBT that were being trialled, just that research was being undertaken to see how CBT could be improved for this age group.

The entire trial was funded by Highways England, including the enhanced syllabus creation; the eLearning resources; website and booking system; training for trainers; CBT course costs; administration costs; and evaluation design and delivery.

The process of the trial is shown overleaf in Figure 1, which details the steps required in the administration of RideFree by Road Safety Analysis and the stages which the participants had to complete for the trial.

Figure 1 CBT trial process



Findings

This section details the findings of the trial.

The first CBT was delivered on 15th December 2018, with the last on 17th June 2019, with the trial spanning exactly six months. There were 71 CBT courses run over that time period.

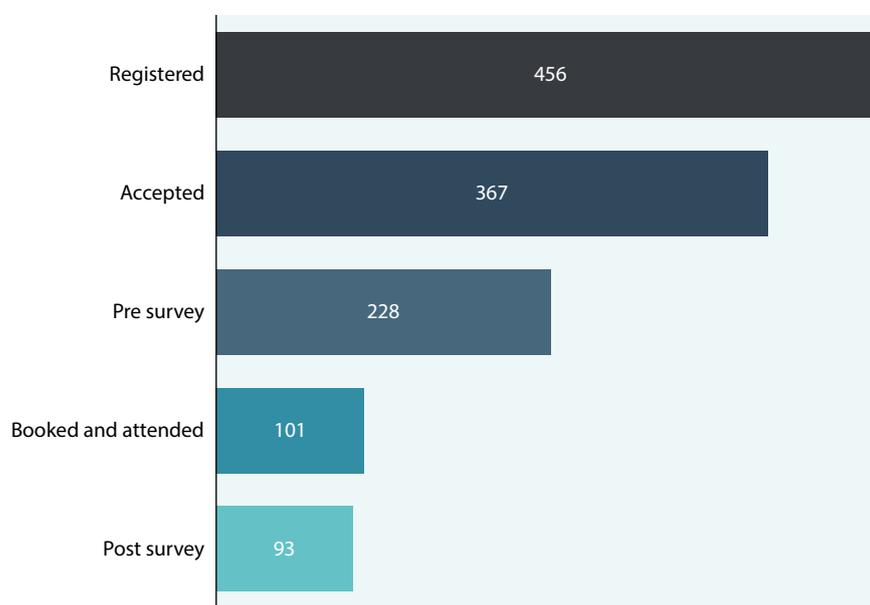
Participation

Recruitment of participants was made through social media advertising (usually Facebook) by road safety partnerships and Approved Training Bodies (ATBs). Posters were displayed in ATBs and motorcycle dealerships. Young people (or their parents) were told about the scheme when enquiring about CBT availability directly with training schools.

Figure 2 shows the participation levels in the project. There were 456 individuals who registered for the RideFree trial. Of these, 376 were eligible, based on age and having had no previous CBT experience, and were therefore accepted. Of these, 228 completed the pre-survey online. This means that only 50% of those who registered actually completed the pre-survey.

The next stage of drop-off of participation was for booking and attendance, with 101 participants getting to this stage, representing 22% of all registrations. Lastly, there were 93 who completed the post-survey after course attendance, representing 20% who completed the whole trial and therefore received their deposit back.

Figure 2 Participation levels



There are a number of factors which affected participation levels. There was a delay to the start of the project, due to the amount of time which was required to create all of the administrative and technical systems and to train the trainers and get CBT course dates in the diary. This meant that the first courses were scheduled in for just before Christmas and New Year. Not only is this a busy time of year for people but also the weather is not ideal for undertaking a CBT course. As the weather improved over the six-month trial period, trainer availability decreased as their time was in higher demand and they were less able to keep dates free for the trial.

Course availability was also a factor with dates not necessarily being on offer in a participant's area for the days that they would have preferred. This may have meant that they chose not to wait and go through RideFree but instead pay for their own CBT.

There were high levels of parental involvement for those who did book and complete the trial. Parents made enquiries about the process and course availability. It could be that those who registered and did not complete the process did not have their parents influencing participation.

It was evident when there had been an advertising push on social media, with large numbers of new registrations immediately after adverts had been posted. This was a successful way of generating interest that could have been used more effectively.

Lastly, whilst the website explained the stages of the trial and how their data would be used, it is thought that some people were suspicious of the process, not believing that "anything is really for free."

Whilst the target sample of 128 participants was not achieved, it was felt that the trial needed to end after six months, especially as trainers were struggling to provide course dates around the commitments of their own businesses. It was disappointing not to achieve the target sample, but the recruitment process did provide a useful insight into how enhanced CBTs would be received if rolled-out more widely.

The sample sizes do mean that no statistical testing has been carried out on the results. However, there was a wide range of quantitative and qualitative data collected through this trial, with consistent findings emerging from across the different sources.

Table 1 shows the number of participants who completed the trial, by CBT type. The analysis in this report is based on these 93 participants, who booked and attended a RideFree CBT and completed the post-survey.

The 'Novice only' group is higher than the other groups because, by default, when the standard CBT only had one student (who was a RideFree participant) it became a novice only CBT.

Table 1 *Participants who completed the trial, by group*

CBT Group Type	Number of Participants completing the trial
Standard CBT (control)	21
Novice only CBT	31
eLearning CBT	20
Two-Day CBT	21

Figure 3, overleaf, shows the age and gender distribution for each CBT group. As detailed earlier, the participants selected the course dates to suit them, not knowing which course type they were booking. Despite this, there are some differences in age across the four groups. These differences could be due to variations in small sample sizes.

Overall, the majority of participants were male and aged 16 years old.

Figure 3 Age and Gender of participants who completed the trial, by CBT group

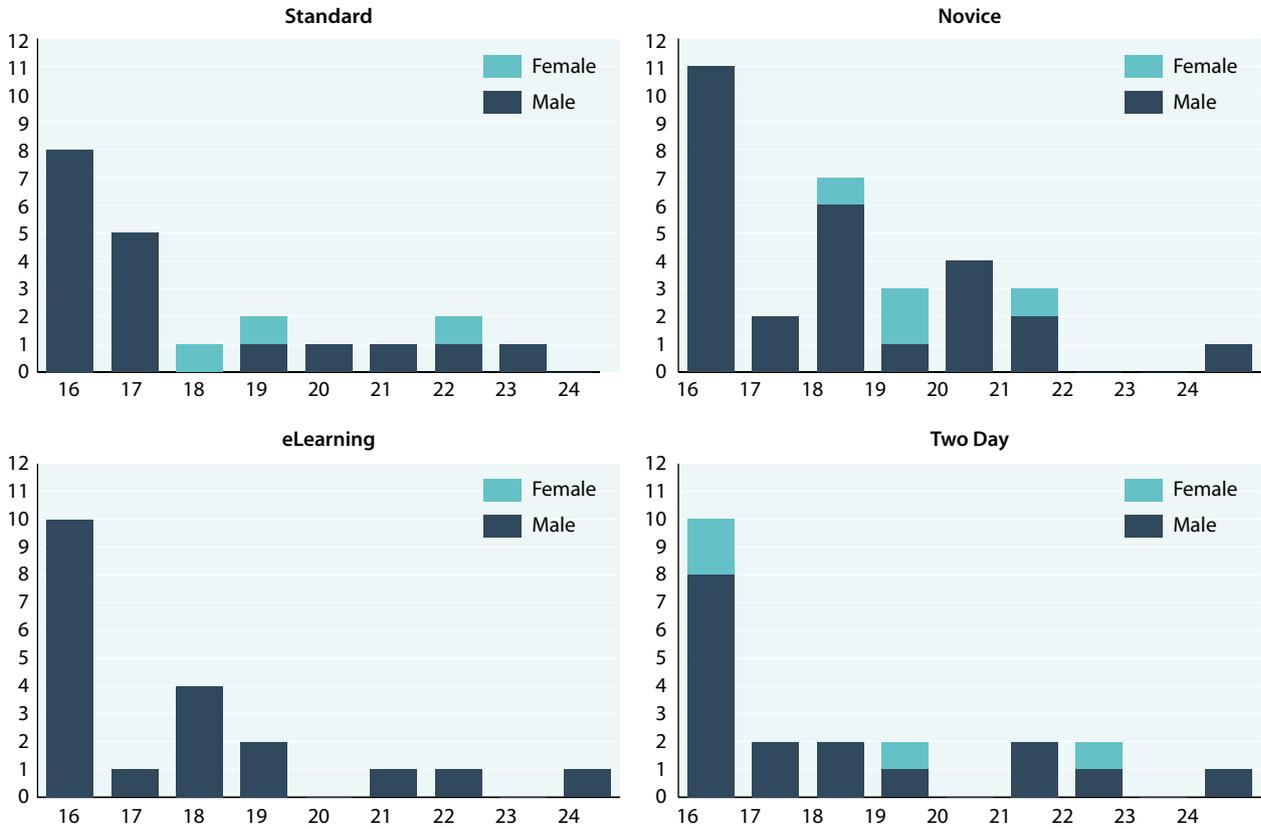


Figure 4 shows the car driving experience of participants in each of the CBT groups. For all of the groups, most participants had not started learning to drive (reflecting the peak in 16-year olds shown in Figure 3). For the young novice and eLearning groups, there were higher percentages of participants who had passed their driving test and 24% of the two-day CBT group were learning to drive.

Figure 4 Car driving experience, by CBT group

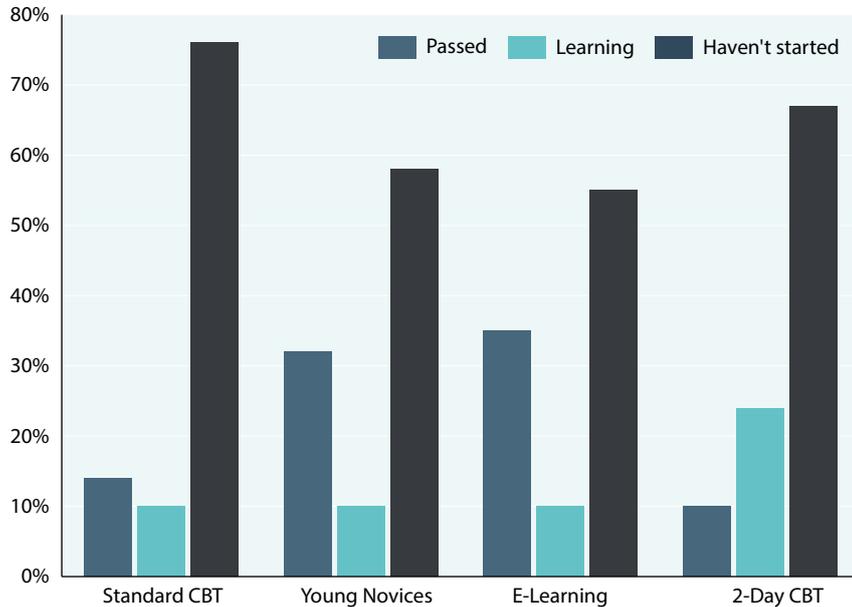


Figure 5 shows the previous riding experience by CBT group. For all groups, most participants had not ridden a motorcycle before but do ride pedal cycles often. For the standard and young novice groups, there were participants who had ridden off-road motorcycles previously. Despite having been accepted onto the trial because they had not completed CBT before, three participants (two in the standard and one in the young novice groups) said that they had completed a CBT course in the pre-survey.

Figure 5 Previous riding experience, by CBT group

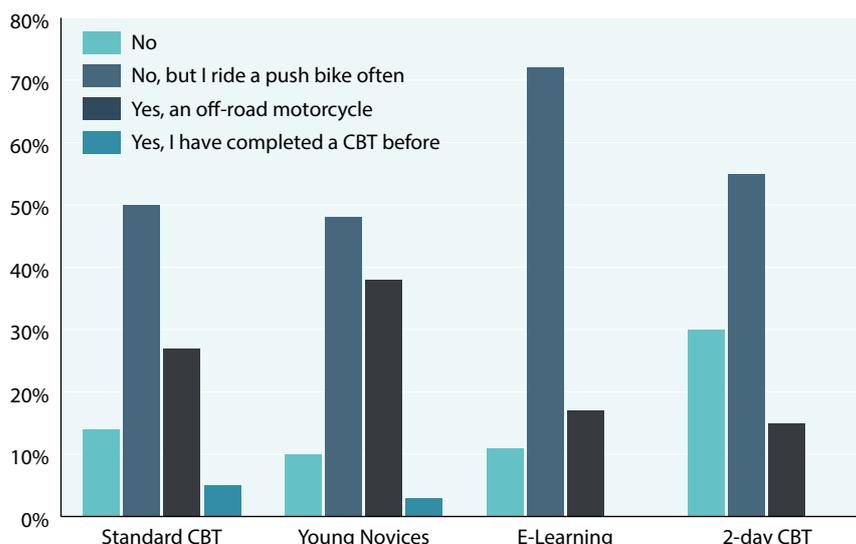
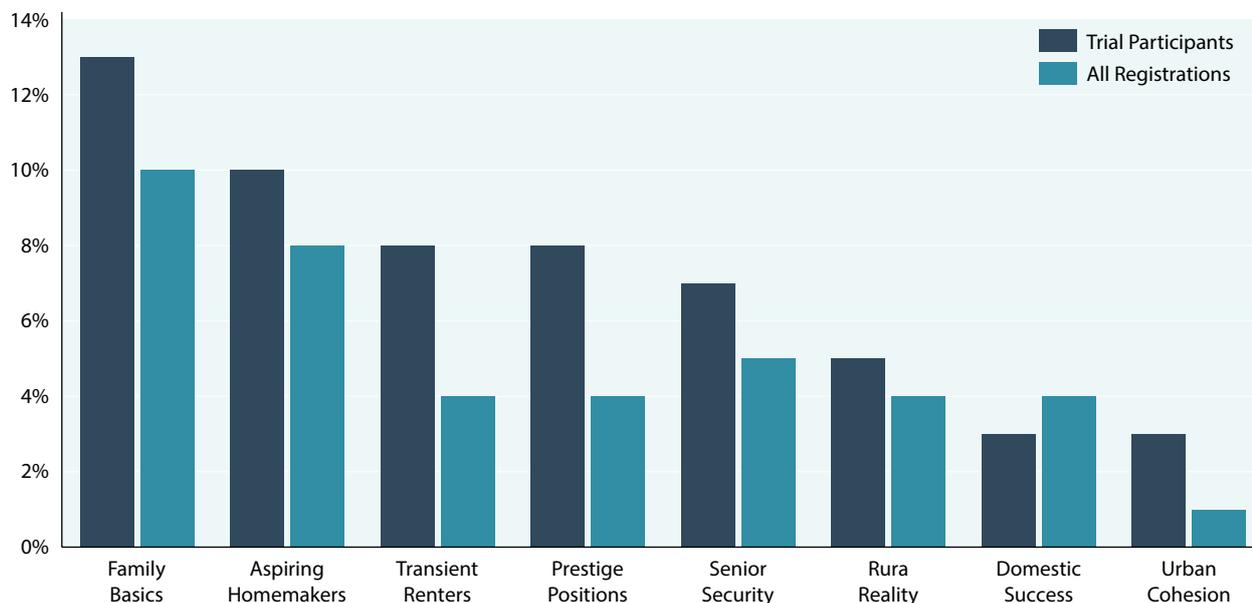


Figure 6 shows the Mosaic Group of the home postcode of participants who registered, compared to the home postcodes of those who completed the RideFree trial. Mosaic classification is based on the individual postcodes provided by those who registered on the RideFree website and uses the Experian Mosaic socio-demographic classification system (for details see <http://www.experian.co.uk/marketing-services/products/mosaic-uk.html>).

Figure 6 Mosaic of home postcode of all registered participants and those who completed



The largest number of trial participants and all registrants were from communities belonging to Mosaic Group M: *Family Basics* and Mosaic Group H: *Aspiring Homemakers*. There were higher percentages of trial participants from these Groups, than all those who registered. These Mosaic Groups are the same as the home communities from which young riders involved in police-reported injury collisions in the East of England are most commonly from.

The characteristics of these two Groups are quite different, suggesting the participants come from varied backgrounds. *Family Basics* communities tend to have low incomes; limited qualifications; are often in poor health; and live in areas where anti-social behaviour levels are high. Conversely, *Aspiring Homemakers* are younger families who do not rely on state benefits; are in reasonable health; and are in lower crime areas.

Trainer feedback

Trainer feedback was important for understanding how participants performed in the various types of CBT and how each CBT course was delivered. A form was completed by each trainer at the end of each CBT session, asking the trainer’s levels of agreement with statements about the session; an opportunity to provide free text on how the session went (including the engagement of the participants, delivery and any issues that were encountered); their levels of agreement with statements about what they felt the student knew at the end of the session; and free text comments about the student.

Whilst the trainers were encouraged to be honest in their feedback in the forms, when the findings of the trial were presented to stakeholders, a trainer did admit that they felt that their own training abilities were also tested in this form, and therefore they may have been reluctant to admit to struggling with any of the sessions.

The samples are not large enough for statistical testing but there are some interesting results, from the trainers’ perspectives.

Figure 7 Levels of agreement with statements about the CBT sessions

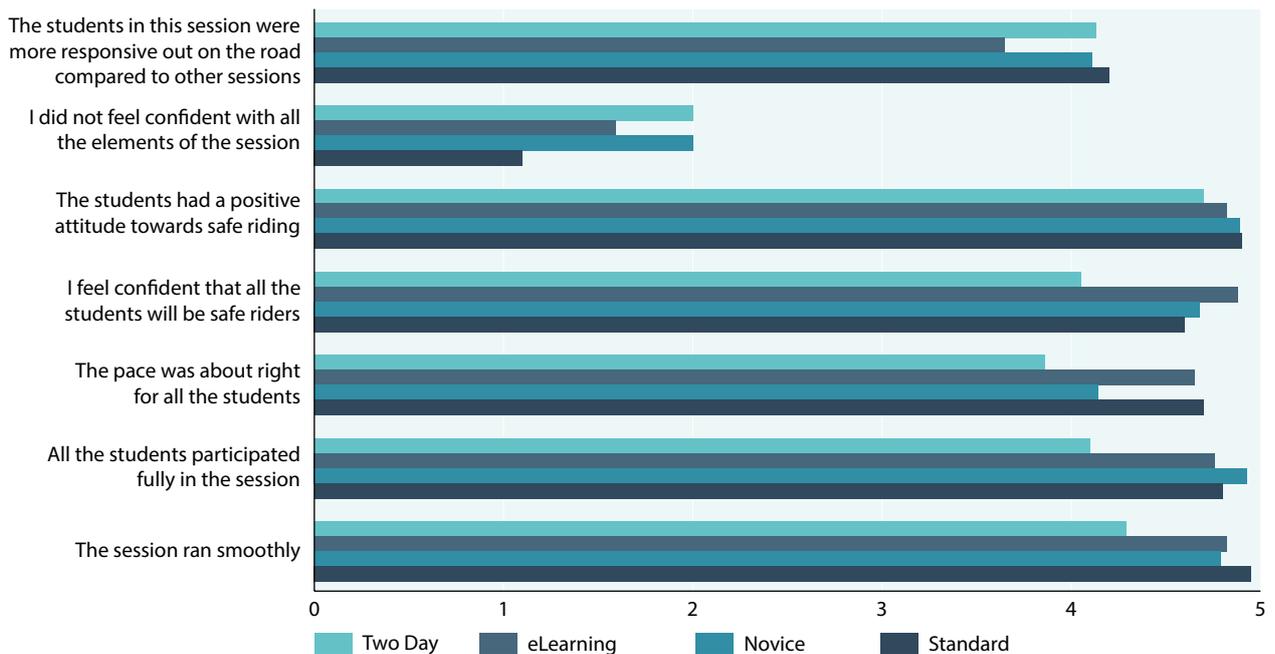


Figure 7 shows the levels of agreement by trainers with statements about the sessions. There was not a great deal of variance between the different types of CBT for the various statements but there were some findings to note.

It seems that, unsurprisingly, the trainers were most comfortable with delivering the standard CBT – this was the CBT type that trainers were most likely to report ran smoothly; were least likely to say that did not feel confident with; thought the pace was right for participants; and that the participants were more responsive than participants of other sessions.

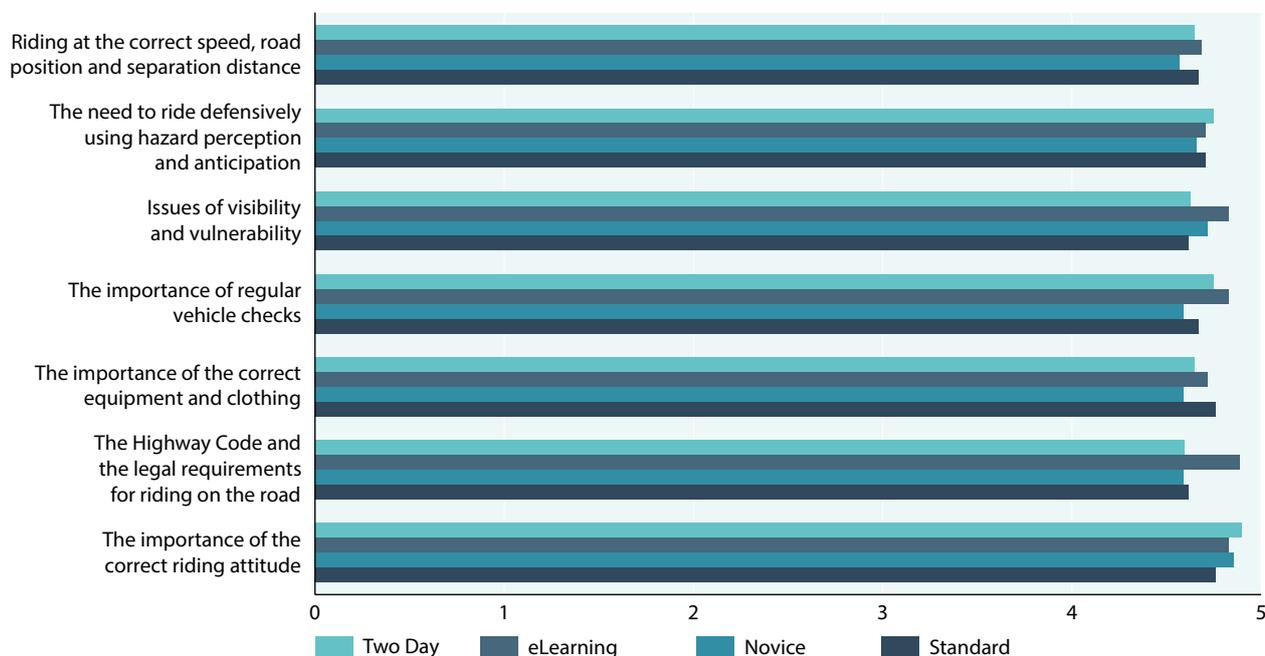
Conversely, trainers were least confident with the two-day CBT. They were not as confident with all of the elements of the session; they were least likely to be confident that all of the participants would be safe riders; that the pace was right for all participants; that all participants fully participated; and that the session ran smoothly.

Figure 8 shows the levels of agreement by trainers with statements about the participants. Again, there was little variance between the groups, perhaps indicating that the trainers felt that they should not be signing off a student’s CBT if they could not agree with all of these statements. However, there were instances where the trainers more frequently agreed with the statements for the eLearning participants. These statements were knowledge of:

- the Highway Code and the legal requirements for riding on the road
- the importance of regular vehicle checks
- issues of visibility and vulnerability

These three topics were specifically covered in the eLearning modules.

Figure 8 *Statements about the participants after the CBT*



Standard CBT

There was some interesting free text feedback about the Standard CBT. Firstly, 14% of the participants in this group were not able to complete their CBT in one day and had to return to complete their training.

However, there was a lot of positive feedback about these participants, highlighting that the participants were mostly confident riders and were interested and well-prepared. Some of the trainers did recognise that this was not the case for all participants and some lacked confidence and experience.

One trainer did state that having a mixed age group was beneficial as the older participants helped the younger ones throughout the day.

Young novice CBT

As with the Standard CBT, there were positive comments about the participants being very interested and engaged but that also there were participants who lacked confidence to begin with.

There were also several comments about how a two-day CBT would have been beneficial for some participants.

Some of the participants in this group came to their CBT unprepared, having not looked at or understood the Highway Code.

One trainer mentioned there were benefits of focusing only on young novices in a CBT.

Enhanced CBT

There were many positive comments about the benefits of the participants completing eLearning before their CBT, as the participants attended prepared and engaged. This meant that the sessions tend to run smoothly.

There were specific cases where a two-day CBT would have been beneficial and where participants appeared overly confident or had a bad attitude towards learning.

Two-Day CBT

The feedback from the two-day CBT was mixed. Several trainers highlighted the different levels of experience between participants, with one providing the example of a student having ridden motorcycles since the age of four years old, who was paired with someone who would have struggled to complete in one day.

However, it was felt that participants were more able to digest information better over two days and this led to better results because of more time. It meant that training was relaxed, providing the time to identify weak areas and then resolve them. In contrast, one trainer felt that it could lead to information overload from repetition and that the syllabus did not flow as well as normal CBT.

There was one student with learning difficulties who needed more than two days to complete their CBT.

The trainer feedback was insightful, showing that whilst they tend to be more comfortable with what they already deliver, they were able to see benefits of eLearning in the knowledge demonstrated by participants. Conversely, the trainers were less confident with delivering the two-day syllabus, which seemed to be less likely to run smoothly.

Trainer interviews

Telephone interviews were conducted with four trainers who had participated the most in the trial. The interviews were designed to delve into the trial more deeply; to understand what the barriers and opportunities were for the different versions of the CBT trialled; and what CBT could look like in the future.

There were mixed feelings about the trial itself. The trainers tended to find it a “pleasurable experience” as it was interesting to do something different from the norm and trial the different versions on offer. One reported that the logistics of the booking process worked well. However, on a practical level, it was felt that holding spaces for trial courses was the biggest issue, with not being busy enough

during the beginning of the trial and then being too busy towards the end, making it difficult to participate in the summer months. There were also practical difficulties with separating participants from non-RideFree participants when running more than one course at the same site on the same day.

When asked if they thought that young novice CBT courses made any difference compared to normal CBTs, most trainers felt that it did not make a difference and that it sometimes had a negative impact.

I don't think it did. There may have been a bit more interaction between candidates on occasion. But it did sometimes have a negative impact with them staring on their phones. More mixed groups are more impactive. Generally, no, it didn't make a difference. Where we did see an improvement, where we had students with mild autism or ADHD, they worked better together as a young group.

It was also felt that trainers deliver according to the needs of participants in a client-centred approach and so there is no need for novice only courses.

Trainers were asked about the sessions with the participants who had received the eLearning and if they felt that they differed from a normal group of CBT participants. The responses were extremely positive, stated that the eLearning was positively received, and the participants were easier to get engaged and were constantly involved. Trainers suggested that it sped up the process of CBT and made it a more rewarding experience. One trainer suggested that it would be a good compromise to a compulsory theory test. The trainers did not suspect that parents had done the eLearning instead and that it was possible to test whether the participants had completed the eLearning through the questions asked in CBT. This was demonstrated with one student who had claimed he'd completed it when it was clear that he hadn't.

It definitely makes a difference. They were quicker in Elements A and B and it was more akin to having students who were car drivers, with experience and knowledge of dangers. It is intuitively the right way to go and instructors might feel more comfortable with this one.

Trainers were asked about how the participants receiving the two-day version differed from all the one-day versions and if the trainers thought it was worth the two days. As with the trainer feedback forms, there were mixed feelings about the two-day version. On a positive note, it was felt that it was positive for young people as it was possible to teach so much more with no restricted time restraints and this was good for the learning received. The only negative seen by one trainer was that the student would be paying for two CBTs.

Another said:

I think there's a basic commercial value and road safety value to two-day CBTs. I have been approached by parents to offer this. Without question, it puts out a safer rider, with more time on the road, out with an approved instructor, giving more experience on the road. It was easy to deliver, and a week gap gave time for it to sink in and so they were better when they came back. Commercially, I don't know if I could sell ones with a week between. For a standard CBT that can't be completed in one day, those who leave it for a few days are a better rider than those who come the next day as they have time to visualise it and for it to sink in.

One felt that it had to be for the right participants:

I thought it was a brilliant idea for certain clientele. For an experienced rider – complete waste of time. For students with educational needs, it worked brilliantly. For a complete novice, who would need to come back anyway, but for a business point of view would try to complete in one day, it could be delayed and would take the pressure off. Having the pressure off was what worked. But from a financial point of view, they paid for two days.

They also mentioned that the week-long gap between Days one and two was too long and that it would have been easier if it was the next day.

There were some negatives about the syllabus that was designed for two days. It was felt that trainers were limited in what could be done on Day One and that they could get so far and not go further, which made it more difficult. There were suggestions about having more flexibility in the syllabus where the order could be changed if necessary, so that confidence-knocking incidents on the first day could be addressed on the second day. It would also be good to include rural roads, cornering and filtering in a two-day syllabus. It was also felt that it was a logistical nightmare when running two-day and normal CBTs at the same site on the same day, because participants needed to be delivered to off-road sites at different times.

When asked about the impact on the on-road riding within Element E in CBT, trainers felt that without question, the two-day CBT enhanced the on-road ride. It was felt that the eLearning forced participants to have a better understanding of the Highway Code. It was suggested that the Highway Code could be included in the CBT as a quiz element and that it was good to stop and talk about the elements through forced breaks in the syllabus.

The trainers were asked if they would change anything about the delivery or content of the versions of the CBT they delivered as part of the trial. Suggestions included:

For the two-day: going out and coming back and going out again. I couldn't understand the need to come back and go back out again. Geographically, I would have liked to go further away, stop at a café rather than having to go back. It breaks it up too much and you lose the drive.

With the pre-learning – making sure it is completed with validation questions. What happens if they have failed the pre-learning? You're not saving the time as then need to cover it.

Trainers were asked “in an ideal world, what format would you like the CBT to be delivered in? This could include parts of any of the versions we trialed or something completely different.” A number of suggestions were put forward:

- Best balance would be pre-learning, evidenced and proven on CBT day (“a compulsory theory test scares me commercially as it will be another barrier to coming into the industry.”)
- From a safety point of view, a two-day CBT but without significant industry change, this won't happen from a commercial point of view
- More flexibility in the order of elements so that the classroom sessions are not first, when the participants are keen to get onto the bike.
- Could talk about issues as they occur: clothing, tyre pressures and braking to reflect on particular incidents
- Flexibility would allow trainers to work around the weather and could combat tiredness by mixing it up
- A compulsory theory test for 16- and 17-year olds which is valid for 36 months for CBTs and car licence
- Include filtering or conversations about filtering in CBT
- Include country roads and positioning on corners, either in theory with booklets or on road

The trainers were asked what the barriers to success would be of introducing alternative versions of CBT. The identified barriers were as follows:

- There is a loss of income if only one person fits the criteria for a specific type of CBT
- There is a need to guarantee completion of eLearning, perhaps with confirmation via DVSA to ATBs
- The cost of the two-day option is difficult to overcome without a sweeping change of industry

- There are logistical issues with delivering a two-day course
- Participants may not admit to needing a two-day course
- Some parents are not interested and may not insist on a two-day course
- A novice only CBT is not always financially viable and mixed groups do remind experienced riders of what they should be doing

eLearning results

There were six eLearning modules to be completed by the eLearning group participants. The modules covered:

- Hazard perception and Highway Code
- Clothing and equipment and Importance of Maintenance
- Introduction to behaviour
- Factors affecting behaviour – internal factors
- Factors affecting behaviour – external factors
- The impact of behaviour

The modules varied in length and whilst the booking system recorded whether a module was completed (and collected results, where applicable), participants were not monitored to confirm all modules were completed before their CBT. Instead, trainers used the enhanced syllabus to test participants on what they learnt from the eLearning.

Figure 9 - Highway Code questions, percentage of participants who were correct

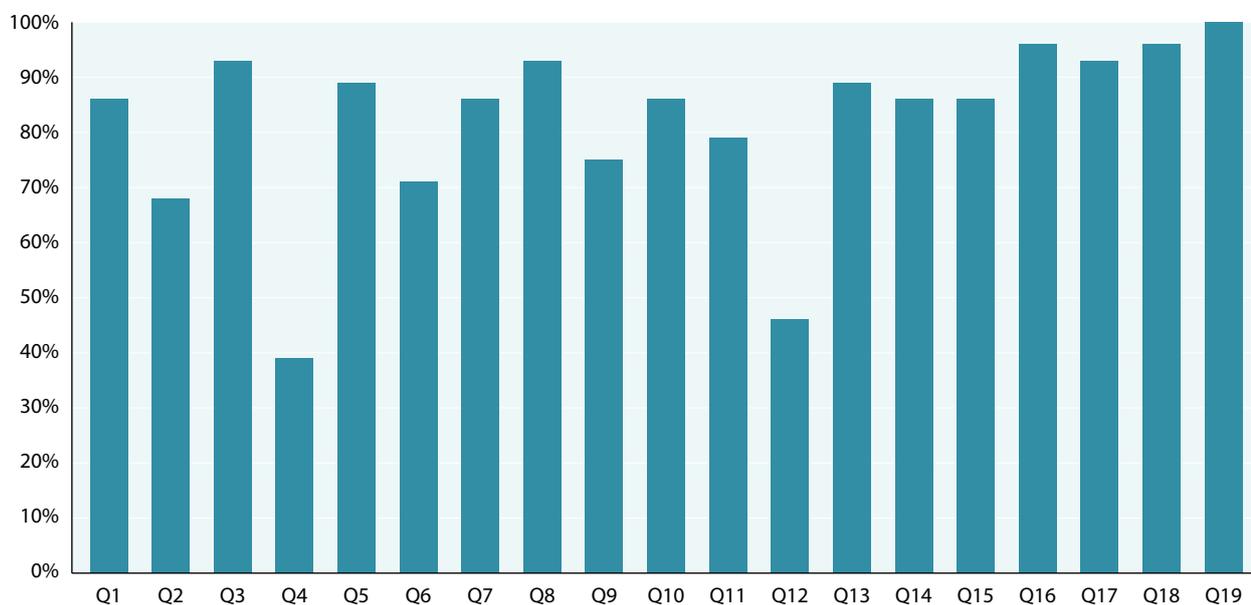


Figure 9 shows that most participants got the Highway Code questions correct in the first module. There were four questions where less than 75% of participants were correct, as shown in Figure 10. For question two, 68% got all of the four signs correct, whereas only 39% were correct about yellow boxes at junctions. For question six, 71% were correct whilst only 46% were correct about the traffic light sequence.

Whilst this doesn't affect the efficacy of the different versions of CBT, these findings are interesting and could be the focus of more attention with rider training.

Figure 10 Highway Code questions where less than 75% of respondents were correct

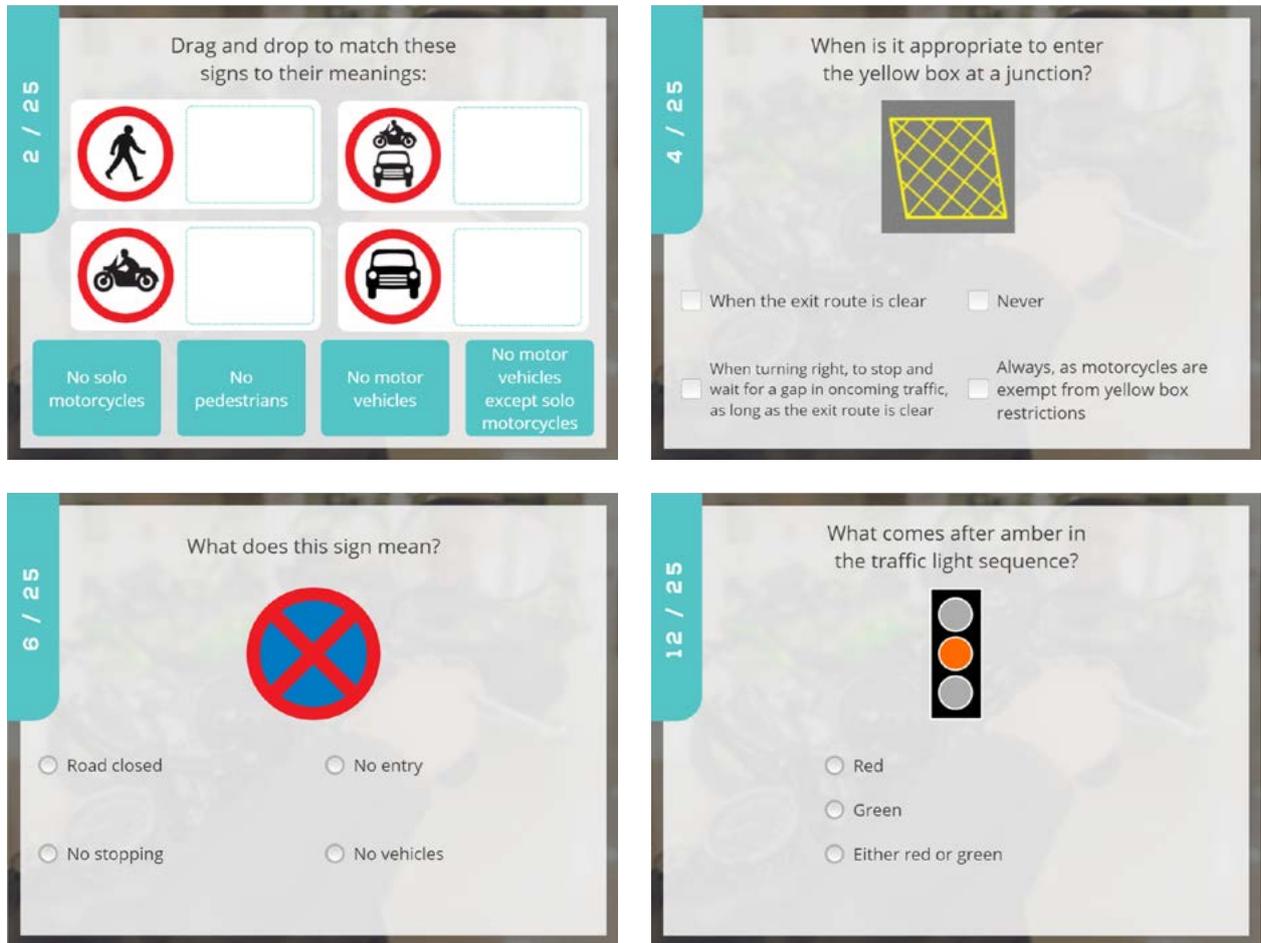
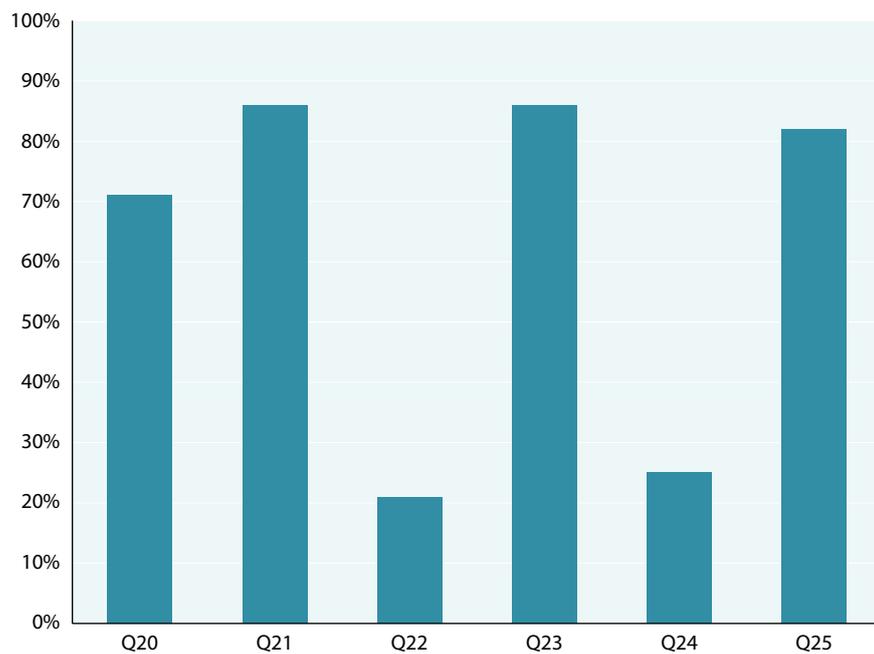


Figure 11 Correct hazard perception clips

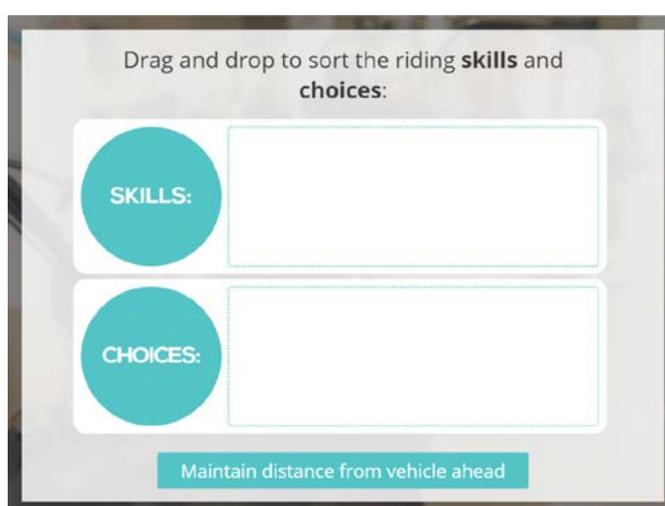


There were six hazard perception clips, created by DVSA and filmed from the motorcyclist's perspective, at the end of which the participant had to answer questions about the hazards that they encountered. Figure 11 shows that for four of the six clips, the majority of participants correctly identified the hazards. With the two clips where less than a quarter of participants were correct, one involved selecting three reasons why a tractor was a hazard to the rider and the other clip had a cyclist turning right as the greatest hazard.

The hazard perception section will have highlighted to participants the need for these skills and that their own hazard perception skills needed to be developed. The importance of hazard perception skills is discussed in detail in the enhanced CBT itself.

Figure 12 *Skills and choices in eLearning*

Drag Item	Drop Target
Steering	Skills
Observations	Skills
Braking	Skills
Clutch control	Skills
Maintain distance from vehicle ahead	Choices
Wearing appropriate clothing	Choices
Speed	Choices
Riding considerably	Choices



Skills and choices are included in one of the eLearning modules and explored in more detail in the enhanced CBT syllabus. Participants had to sort eight items into 'Skills' or 'Choices', with the correct responses shown in Figure 12. Only 43% of respondents correctly sorted the items, providing an opportunity to explore this in more detail in the CBT itself.

Figure 13 *Riding distractions*

Drag Item	Drop Target
Thinking about a job interview	Internal
Worrying about a friend who is upset	Internal
Having a headache	Internal
Wondering if you are going to be late	Internal
Two drivers having an argument	External
Being wet and cold	External
Waving to a friend	External
A problem with your bike	External

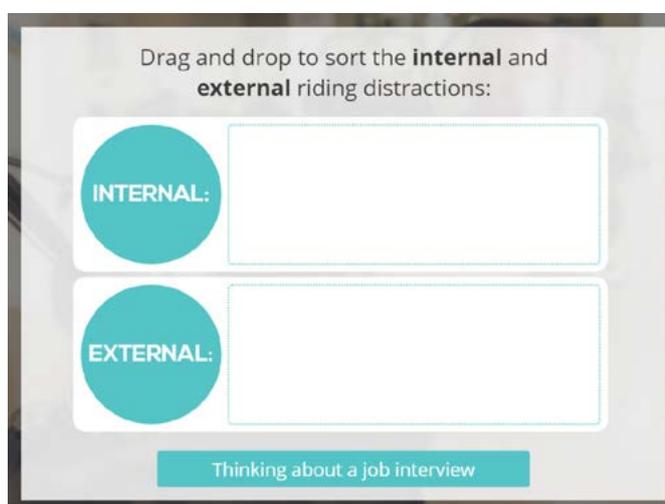


Figure 13 shows a question about internal and external riding distractions. For this question, 71% of the respondents correctly sorted the options.

There was a question in one module about what the maximum recommended riding time is before stopping for a break, with the correct answer of two hours identified by 46% of respondents. This should be explored in the CBT itself and is not currently covered in detailed in the one-day enhanced syllabus.

The eLearning results are not an indication of the efficacy of this version of the CBT but more a gauge of the knowledge levels of participants before they undertook their formal training. The eLearning provided an opportunity to share information with participants and free up time in the CBT plus provided a springboard for discussions of the learning within the enhanced syllabus.

If there were to be changes to the eLearning based on the results of these questions in the modules, these would primarily be to the CBT syllabus, ensuring that the need for developing good hazard perception skills is emphasised and with additional specific content on skills and choices and the need for rest breaks.

Participant feedback on CBT

Online surveys were completed by each student before booking their CBT and another once their CBT was completed. The same questions were asked in the pre- and post-surveys, with additional questions about the CBT they received included in the post-survey. Analysis of the closed questionnaires is included in the next section of this report on page 25.

At the beginning of the post-survey, participants were asked if they had any comments about the CBT they took. It qualified this by stating that “we are interested in your thoughts on the topics you covered, the length of time it took, how it was organised and how it could be improved”.

Standard CBT

The following quotes are comments received about the standard CBT:

More Highway Code info

It could be improved with a longer theory section

I found the CBT test very helpful and would recommend to friends

The instructor was very understanding and knew what we need to spend more time on and things we just had to touch on. The overall experience was perfect

The CBT was very well structured and went through the basics and progressed to the harder skills to learn. Overall the course felt just tight time wise

They were supportive and helpful. They gave me the confidence I needed as I had never been on the road before other than with a bicycle.

Very good instructor and felt very confident in what I done

Overall, the feedback from the participants on the standard CBT was positive, although they did note that they lacked Highway Code and theory information and that the CBT was a lot to cover in the allocated time.

Novice CBT

The following quotes were provided about the novice-only CBT:

The day planned out really well and there were no interruptions

I found it be useful. All topics was went through in a way that was easy to understand. I wouldn't change anything

I feel that I was trained very well considering how quick the course was, it helped that I had previously done my theory test for a car and some lessons

I thoroughly enjoyed the day and the instruction was superb. I found it very interesting and the advice was excellent. The slow riding training made me focus really hard and it took some practice to get it right. I am now going to go further and compete my test.

The course was really well delivered and the instructor was very patient with my poor clutch control

Again, the feedback was very positive but with one comment about how quick CBT is.

Enhanced CBT

These comments were about the enhanced CBT with eLearning:

Overall my experience was positive. Instructor was friendly and helpful, very encouraging and professional. It took roughly 6 hours to complete and was thorough

Was a great day teaching me to become a rider that is safe to learn on the road. Topics covered were extensive and covered all aspects of motorcycle safety

Could've happily spent longer out on the roads, it was good fun

The CBT was well-organised, well taught. They explained things that I did not understand and they didn't make me feel pressured at all.

I liked the E-learning. Gave me the confidence to go in, knowing something about riding motorbikes

I felt the CBT was well organised, and the instructors were friendly with an extensive knowledge of motorcycle training

The whole process was full of beneficial tips and instructions for myself and the others to use when riding. The instructor was a police and well matured man who was understanding and really helpful when one of his students needed help.

The comments about the enhanced CBT were all extremely positive, with no negative feedback received. It is interesting to note that this group spontaneously mentioned safety and that they liked the eLearning.

Two-Day CBT

Lastly, these were some of the comments about the two-day version of CBT:

I think every CBT should be 2 days

Two days was useful as my confidence was low and it took a while to learn some of the practical side.

I think the length of the CBT was very good. Having two days to learn gave me time to build confidence before going out on the road. I feel I was given the best tuition

Having the two days [a] week apart was a little long in my opinion, apart from that I was very pleased with how long it took and what I was able to achieve in that time

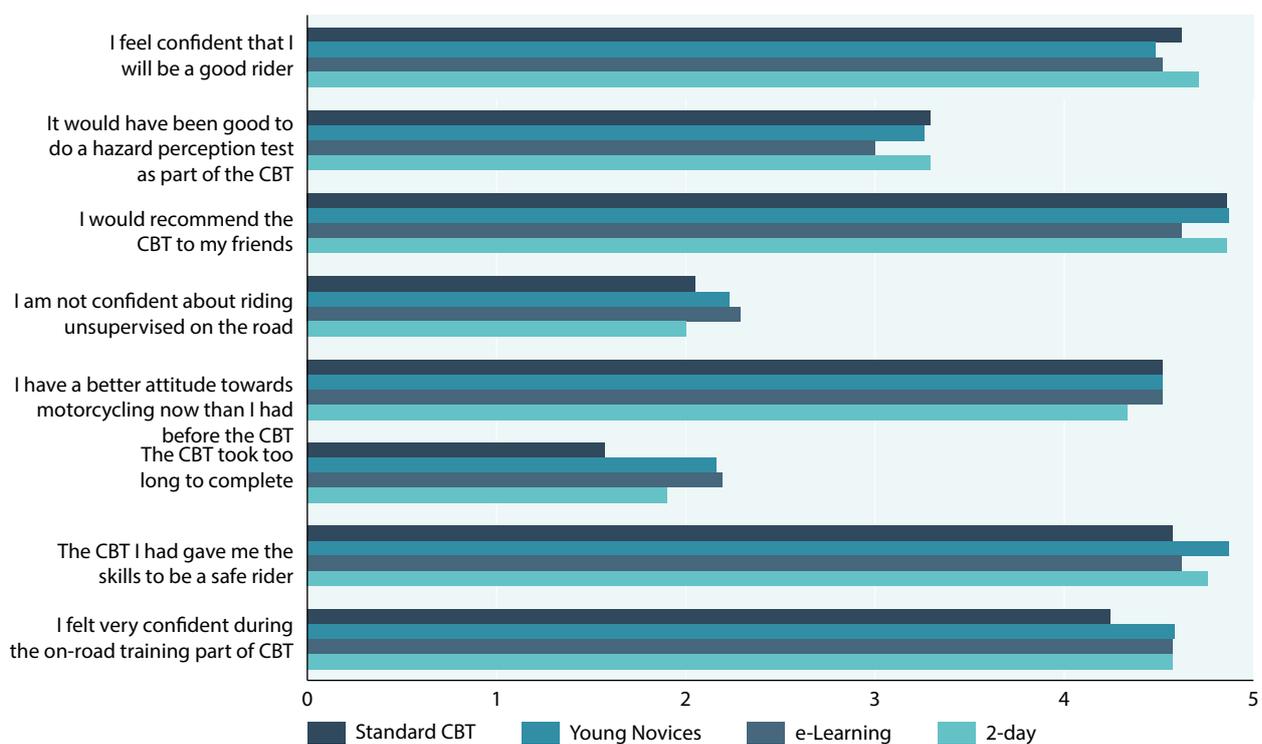
I feel the CBT is very short. Considering I spent a year learning to drive it amazes me you only 1/2 days to complete a CBT! Though the course I took was very informative and the instructors was very patient with me and gave me the confidence I needed!

It was very well organised, and they made sure I was confident to ride on the road

The comments for the two-day version were also positive, with participants very aware that the two days they took to complete their CBT not being the usual allotted time. Trainers were told not to

discuss the other types of CBT with participants, but it is likely that many participants would already be aware that one day is the normal length of time, especially if other CBTs were being delivered at the same time as their training. It is interesting to note that participants did not feel two days was too much and in fact, in one case, that it is still a short length of time.

Figure 14 Agreement with statements about their CBT



The participants were asked about their levels of agreement with a range of statements about their CBT, shown in Figure 14. There were small variances between the four groups, with the standard CBT and two-day CBT participants most likely to feel confident that they will be a good rider. Related to confidence, participants in these two groups were least likely to agree that they were not confident about riding unsupervised on the road, with the eLearning participants most likely to agree with this statement. This might reflect, in part, the final eLearning module, which focused on the stages of learning to ride and emphasised that experience improves the way in which someone rides. The final confidence statement was about being feeling confident during the on-road training part of CBT; in this case, the standard CBT participants were least likely to agree that they are very confident.

The young novice and two-day participants were most likely to agree that the CBT gave them the skills to be a safe rider. Conversely, the two-day participants had the lowest level of agreement about having a better attitude towards motorcycling after the CBT.

eLearning participants were the least likely to agree that it would have been good to do a hazard perception test as part of the CBT, presumably because they had covered hazard perception in the first eLearning module. The young novices and two-day participants were most likely to agree that they had been given the skills to be a safe rider.

Whilst all groups of participants agreed that they would recommend the CBT to their friends, the eLearning participants were slightly less likely to agree with this statement.

The standard and two-day CBT participants were the least likely to agree with the statement that the CBT took long to complete, reflecting the free text feedback from the two-day participants.

Whilst it should be remembered that the sample sizes are too small to undertake statistical testing and that small samples are subject to fluctuation, these responses suggest that the two-day participants were the most confident after their CBT, with eLearning participants not as confident. Reducing confidence, and particularly over-confidence, amongst young riders can be seen as a positive result.

A decrease in driver confidence can be considered to be a positive outcome. For example, some driver training programmes which focus on vehicle handling skills may lead to increased risk taking due to learners' inflated level of confidence in their driving skills.¹

The findings also reflect the eLearning hazard perception content and that participants who took a two-day CBT felt that more time is required for the training.

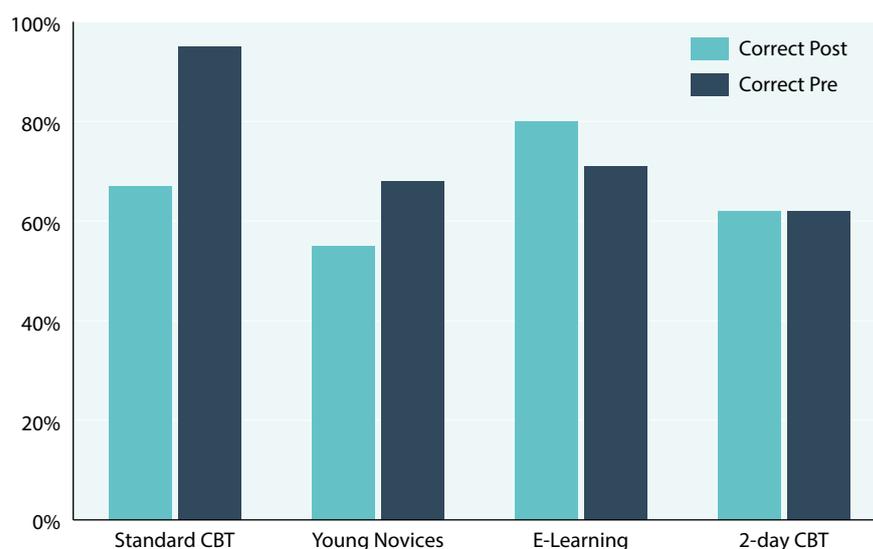
Participant questionnaires

As detailed in the previous section, participants completed online surveys before and after their CBT, which included a combination of questions, covering:

- Factual based questions on helmet replacement, motorbike maintenance and factors which can affect riding
- Social norms and willingness questions, asking how willing a friend would be to engage in certain safe and risky riding behaviours
- Attitudinal questions about driver and motorcyclist behaviours
- Knowledge questions about identifying factors which contribute to collisions

Figure 15 shows the percentage of participants from each CBT group who correctly identified that riders should replace their helmet every three to five years. There were improvements for the standard and novice only CBT participants and no change for the two-day participants. In the pre-survey, 80% of the eLearning participants were correct in their response but this reduced to 71% in the post-survey.

Figure 15 How often should you replace your helmet?



¹ Pressley, A., Fernandez-Medina, K., Helman, S., McKenna, F.P., Stradling, S. and Husband, P., *A review of interventions which seek to increase the safety of young and novice drivers*, (Published Project Report PPR781, Transport Research Laboratory, 2016), p.22

However, as shown in Figure 16, there were two sets of information provided in the eLearning on helmet wearing, with the calendar graphic highlighting the manufacturers' recommendations alongside the norm for riders. This is likely to have affected the responses to this question for the eLearning participants.

Figure 16 Screenshot of eLearning module about helmets



Table 2 shows the percentages of participants who selected each factor which can affect their riding. Participants in all groups were aware that tiredness and distraction affect riding. For the Standard CBT respondents, there were small improvements or no change in the selection of all factors, with the greatest improvement being in 'your personality'. There was a similar pattern for the novice-only participants, although there were three factors that were not selected as frequently at the post-stage: 'distraction', 'stress' and 'heavy traffic'.

For the enhanced CBT group, there were improvements in selecting all factors, with many of these factors larger than for the other groups. All of these factors were covered in the eLearning, especially stress, fatigue, navigation problems, distractions, personality and peer pressure.

For the two-day CBT participants, there were lower percentages selecting 'distraction' and 'vehicle problems'; no change in 'bad weather' and 'tiredness'; and improvements in the other factors, especially 'heavy traffic'.

Table 2 Selection of factors which can affect riding

Factors	Standard CBT		Novice only CBT		Enhanced CBT		Two-Day CBT	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Bad weather	86%	95%	97%	100%	90%	100%	100%	100%
Distraction	86%	95%	100%	94%	80%	100%	100%	95%
Heavy traffic	48%	48%	61%	58%	60%	85%	52%	76%
Navigation problems	48%	52%	74%	84%	55%	90%	62%	76%
Peer pressure	48%	48%	65%	74%	65%	95%	81%	90%
Running late	57%	62%	61%	71%	65%	85%	57%	76%
Stress	81%	95%	97%	90%	80%	100%	95%	95%
Tiredness	100%	100%	100%	100%	95%	100%	100%	100%
Vehicle problems	81%	90%	94%	97%	85%	100%	95%	86%
Your personality	10%	29%	26%	32%	40%	60%	24%	33%

Table 3 presents a mixed picture about knowledge of reasons for motorcycle maintenance. Participants from all groups were most likely to identify that it 'may be risky to ride' or they 'may break down' if they do not maintain their bike.

There was an increase in 'makes a smoother ride' and a decrease in 'may break down' for standard CBT participants and for all but one reason ('may not look as good'), there was movement in the wrong direction for the novice only participants.

For the enhanced CBT participants, there was a large increase in 'makes a smoother ride' but movement in the wrong direction for 'may be risky to ride' and 'may make you slower'. For the two-day CBT participants, there were increases for many of the statements but movement in the wrong direction for 'gives better fuel economy' and 'may not look as good'.

Table 3 Reasons for motorcycle maintenance

Reasons	Standard CBT		Novice only CBT		Enhanced CBT		Two-Day CBT	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Gives better fuel economy	48%	48%	68%	58%	65%	75%	67%	57%
Makes a smoother ride	52%	67%	81%	61%	65%	90%	67%	67%
May be risky to ride	76%	76%	90%	68%	95%	80%	81%	86%
May break down	76%	67%	87%	71%	80%	85%	62%	81%
May make you slower	5%	0%	6%	13%	5%	15%	14%	10%
May not look as good	0%	0%	13%	10%	15%	15%	10%	14%

Table 4 shows the levels of agreement with statements about drivers' and motorcyclists' behaviours. There was a five-point scale of Strong Disagree (1) to Strongly Agree (5), with a mixture of positive and negative statements. As before, statistical tests could not be applied to these responses but differences of more than 0.30 in the scores between pre and post have been highlighted.

Table 4 Agreement with statements about motorcyclists' and drivers' behaviour

Statements	Standard CBT		Novice only CBT		Enhanced CBT		Two-Day CBT	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
I am aware that drivers often find it hard to see motorcyclists	4.55	4.63	4.75	4.96	4.58	4.71	4.53	4.79
I will ride on the assumption that another road user hasn't seen me	3.50	4.00	4.54	4.63	3.84	3.76	4.16	4.84
I would still wear a helmet after dropping it on a hard surface	1.85	1.68	2.04	1.56	2.05	1.29	1.74	1.47
It is important to do basic vehicle checks before every ride	4.65	4.74	4.64	4.81	4.16	4.35	4.47	4.58
Learning to be a good rider is much more than developing good skills	4.45	4.47	4.36	4.41	4.11	4.18	4.42	4.32
Motorcyclists should slow down around junctions to help drivers judge their speed	4.15	3.84	4.21	4.37	3.68	4.47	4.05	4.00
My image is more important to me than wearing lots of safety clothing	1.25	1.63	1.46	1.63	1.58	1.53	1.47	1.47
Some motorcyclists ride too fast on the road	4.50	4.53	4.61	4.70	4.53	4.35	4.58	4.47

For the standard CBT and two-day CBT participants, there were increases in the levels of agreement with the statement 'I will ride on the assumption that another road user hasn't seen me.' For the standard CBT participants, there was movement in the wrong direction for 'motorcyclists should slow down around junctions to help drivers judge their speed' and 'my image is more important to me than wearing lots of safety clothing.' For the novice only and enhanced CBT participants, there were reductions in the number who agreed that 'I would still wear a helmet after dropping in on a hard surface.' There was also an improvement amongst the enhanced CBT participants for 'motorcyclists should slow down around junctions to help drivers judge their speed'.

The next question asked about participants to imagine their best friend road a motorcycle and for them to decide how willing they thought he or she would be to engage in different behaviours when riding. The question was deliberately phrased in this way for two reasons: firstly, it is based on the Prototype Willingness Model², which is an adolescent-based behaviour change model which proposes that willingness is a better predictor of young people's behaviour than intentions. It is based on the theory that young people do not intend to engage in risky behaviours but, given certain situations, may be willing to. The second reason is to externalise the behaviours to a friend and an imaginary situation to encourage honesty and provide an indication of social norms about these behaviours, gauging by what they think their friends would be willing to do, how acceptable

² Gerrard, M., Gibbons, F.X., Houlihan, A.E., Stock, M.L. & Pomery, E.A. (2007). A dual-process approach to health risk decision making: The prototype willingness model. *Developmental Review* 28 (2008) 29-61

they think the behaviours are. For each behaviour, the participants had to indicate how willing they thought their friends were on a six-point scale, with 1 not very willing and 6 very willing.

Table 5 Willingness of best friend to engage in behaviours when motorcycling (using an adapted version of the Motorcycle Rider Behaviour Questionnaire (MRBQ)³)

Behaviours	Standard CBT		Novice only CBT		Enhanced CBT		Two-Day CBT	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Accidentally pull out onto a main road in front of a vehicle	1.19	1.38	1.23	1.37	1.60	1.86	1.33	1.38
Be a confident rider	5.33	5.71	5.26	5.40	5.25	5.00	5.00	5.43
Do basic vehicle checks before every ride	4.76	5.24	4.87	4.93	3.90	4.33	4.71	4.71
Exceed the speed limit in towns	1.33	1.71	1.13	1.43	1.45	1.90	1.48	1.29
Exceed the speed limit out of towns	1.67	1.95	1.42	1.63	1.95	2.29	1.67	1.57
Follow the vehicle in front too closely	1.19	1.43	1.16	1.23	1.55	1.95	1.43	1.19
Get distracted easily	1.48	1.38	1.52	1.57	1.85	2.33	1.86	1.71
Get involved in 'races' with other road users	1.14	1.38	1.03	1.17	1.15	1.52	1.19	1.14
Know how to maintain their bike properly	4.90	5.38	5.03	5.20	4.80	4.62	4.67	4.90
Not wear a protective jacket	2.00	1.90	1.45	1.50	1.50	2.19	1.71	1.38
Ride in a large group of friends	2.14	2.60	2.10	2.50	2.45	2.57	2.71	2.52
Ride when tired	1.67	1.38	1.39	1.40	1.80	1.95	1.71	1.52
Wear bright/fluorescent clothing	4.33	4.43	4.58	4.33	3.75	3.71	4.33	4.57

There are some interesting findings to this question, especially for the enhanced CBT participants. For the novice only and two-day CBT participants, there were two statements each where willingness moved in the wrong direction: for novice only participants, this was for their friends being more willing to 'exceed the speed limit in towns' and 'ride in a large group of friends' whilst for the two-day CBT participants, the behaviours were 'not wear a protective jacket' and 'be a confident rider' (as discussed earlier, increased confidence can elevate risk).

³ Elliott, M.A., Baughan, C.J. and Sexton, B.F., 'Errors and violations in relation to motorcyclists' crash risk', *Accident Analysis and Prevention* 39 (2007) 491-499

For the standard CBT participants, there was a mixed picture. These participants thought that their friends were more willing to 'do basic vehicle checks before every ride' and 'know how to maintain their bike properly'. Conversely, they also thought that their friends would be more willing to 'be a confident rider', 'exceed the speed limit in towns' and 'ride in a large group of friends'.

For the enhanced CBT participants, there was a perceived increased willingness of their friends to 'do basic vehicle checks before every ride'. However, there were also increases in willingness in the following behaviours: 'exceed the speed limit in towns', 'exceed the speed limit out of towns', 'follow the vehicle in front too closely', 'get distracted easily', 'get involved in races with other road users' and 'not wear a protective jacket'.

Initially, these results, especially for the enhanced CBT participants, are alarming. This question was designed to test social norms, using a measure of willingness, rather than intentions. It could be interpreted that the enhanced CBT has affected social norms in a negative way (although as before, the samples are too small for statistical testing). However, it is interesting to observe that the behaviours specifically highlighted as negative in the eLearning were the ones where willingness increased. The eLearning modules provided information on these behaviours and included coping strategies to avoid these behaviours (as shown in Figure 17). It could be that these findings are less about social norms and more about the knowledge deficits of other young riders that these participants are now more aware of. This conclusion would be more consistent with the other findings observed from the online surveys and feedback from participants and trainers. However, the eLearning and enhanced syllabus should be reviewed to ensure that negative behaviours are not normalised.

Figure 17 Screenshot of section of behaviour eLearning module



Participants were asked how often they thought different factors caused motorcycle collisions, on a six-point scale, ranging from 'never' (1) to 'always' (6). The results are shown in Table 6. Overall, participants tended to think that most factors often or very often caused collisions, although they were generally likely to think that poorly maintained roads or traffic congestion caused collisions less frequently. There were factors across three of the groups, which participants thought contributed to motorcycle collisions less frequently after the CBTs, with an increase in frequency for the novice only participants for 'poorly maintained roads'.

Table 6 Factors causing motorcycle collisions

Factors causing collisions	Standard CBT		Novice only CBT		Enhanced CBT		Two-Day CBT	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Bad weather	4.29	4.19	3.97	4.00	3.55	3.00	4.14	3.81
Drinking alcohol and motorcycling	5.00	4.52	4.58	4.55	4.55	4.14	4.29	4.19
Following too closely the vehicle in front	4.48	4.24	4.10	4.39	4.00	4.19	3.76	4.00
Motorcycling when tired	4.10	4.38	4.03	4.03	3.85	3.95	3.86	3.71
Poorly maintained motorcycle	4.05	4.05	3.90	3.74	3.65	3.48	3.48	3.43
Poorly maintained roads	3.67	3.81	3.65	4.00	3.30	3.43	3.62	3.90
Riding too fast	5.10	4.67	4.61	4.65	4.40	4.67	4.67	4.57
Traffic congestion	3.48	3.00	3.35	3.29	3.00	3.24	3.05	3.19

Overall, the participant questionnaire results indicate that the enhanced CBT group often demonstrated learning not observed by the other groups. These findings include increase in knowledge about factors which affect riding; the importance of motorcycle maintenance; and improvements in attitudinal statements. These findings are not reflected across the other CBT groups.

However, there are some areas of the enhanced CBT which need reviewing. There appears to be confusion about how frequently helmets should be changed and how often some factors cause collisions, and these could be covered in an improved syllabus. The findings from the question about friends' willingness need greater reviewing to ensure that negative behaviours are not being normalised, and that instead the results are indicating a greater awareness of the inadequacies of young riders.

Findings feedback session

The findings were presented to a meeting on stakeholders on the 8th July 2019 at the DVSA Training Academy at Cardington. Attendees included representatives from Highways England, DVSA, MCIA, Agilysis/Road Safety Analysis, Bedford Borough Council, Safer Essex Roads Partnership, Suffolk County Council, Hertfordshire County Council, Luton Borough Council and one of the motorcycle trainers who participated in the scheme. The session included a presentation from Road Safety Analysis on the results from the trial and discussions amongst stakeholders on what the results mean and how they could be taken forward.

Enhanced CBT

Given the findings from the trainers' feedback and interviews and participants' questionnaires, the enhanced CBT with eLearning became a key topic of conversation. There were a number of good suggestions that could encourage completion of eLearning prior to an enhanced CBT:

- Production of a certificate on completion or a code that could be shared with ATBs, via DVSA
- Feedback to trainers to share weak and strong areas
- Ensure trainers are testing eLearning knowledge through specific questions to be asked in enhanced CBT
- Send email to parents, suggesting they can help their child by getting them to complete the eLearning and what the benefits of completing it will be
- Disclaimer at the beginning of eLearning, aimed at parents, which encourages them to support their child through the eLearning without the parent completing it on their child's behalf
- Road safety partnerships and other stakeholders could promote the enhanced CBT, signposting to one tested product, rather than creating bespoke versions
- Road safety partnerships and other stakeholders need to work with ATBs to encourage them to promote and deliver the enhanced CBT
- Review the eLearning content to address the specific issues on helmet wearing and collision factors, and unravel the social norms findings, to ensure that negative behaviours have not been normalised
- Devise a clear marketing strategy for the enhanced version, with DVSA endorsement, to encourage take-up. Promotion to students could highlight that they are less likely to need two days to complete CBT; to ATBs that the students will be more responsive, and the CBT will flow better; and to parents, that their child will be better equipped to ride safely.
- Maintain the RideFree branding but change the address to co.uk (from .co) and to a secured site.
- Consider language barriers and how this would affect national roll out
- Explore hosting costs and required website/eLearning changes
- Produce a training pack for ATBs, perhaps with a training video online, accessible via a secure area of the RideFree website
- It would be good to encourage students back to ATBs six months later to see how much information has been retained and to see how they are riding (as now, once they have their certificate and insurance, they can do whatever they want)
- There is a need to focus on the benefits of motorcycling, rather than fear appeals via interventions

The eLearning was positively received by the stakeholders, because it includes Highway Code and attitudinal elements and it is a good compromise from a theory test (which requires legislation before it could be implemented for CBT).

There were also discussions about the implementation of the two-day CBT. It was positively received by participants but there were a number of barriers to offering it across the board. These were:

- Price issues related to the need to pay for two days of training
- Practical issues with delivery alongside standard CBT
- Students may not admit that they need a two-day course and may compare themselves to others who complete in one day

Wider discussions explored how Approved Driving Instructors (ADIs) have a stronger community than ATBs. It was observed that ATBs are disconnected as an industry and do not have as much support as ADIs. ADIs tend to be more actively involved in road safety. Many ATBs are managed by individuals who are passionate about motorcycling but are not necessarily commercially minded. Often ATBs' strategies are to offer cheap CBT to get customers engaged, and then encourage them onto full licensure. This means that the CBT is often neglected, and market competition means there is little road safety focus. In the trainer interviews, interviewees were asked whether they felt that

there was a need for community to be built for CBT trainers, to learn from others and to build on best practice. The responses were mixed, with many believing it to be a good idea but that there are barriers in place because of competition.

I wouldn't want to share with the competition on the other side of the town – I wouldn't want them to start doing the same things. We have our unique selling points.

I don't know. It's a low paid community. I don't think they would be interested in learning more. It should come from the DVSA – it's the stick that makes them do things right.

Absolutely. I considered trying to start one locally, to discuss local problems, best practice, issues with DVSA etc. Finding ways to work together. We would talk about price in an ideal world – charging what the product is worth. A community would be favourable, especially a local one.

Would be good to offer that – opportunities for instructors to meet.

Good idea but like any industry, we're reluctant to get together. They do it within their organisation but reluctant to talk to each other about the ways in which they do things. Everyone thinks they are doing it right and it ends in classroom squabbles! All in competition with each other so not going to share with one another.

A stronger community of ATBs would provide an engagement route for road safety partnerships and opportunities to listen to their needs and promote interventions, such as RideFree. ATBs have the most contact with young riders and should be used to promote messages and identify what does and doesn't work. ATBs can be used to promote other road safety interventions; there were clear spikes in recruitment to RideFree when ATBs promoted the scheme on social media.

Conclusions

This trial provided insight into four versions of CBT, using data collected through a range of methods.

Main findings

The main findings are as follows:

- The sample sizes are not as large as was hoped at the beginning of the trial, because of participant drop-out
- The achieved sample reflected the at-risk target group in terms of age, gender, motorcycling experience and Mosaic background

Enhanced CBT

- Trainers felt that participants who had completed the eLearning had greater knowledge of
 - the Highway Code and the legal requirements for riding on the road
 - the importance of regular vehicle checks
 - issues of visibility and vulnerability
- The enhanced CBT participants were more responsive, and their pre-knowledge sped up the process, with students who were more akin to car drivers
- The eLearning gave participants a better understanding of the Highway Code, according to trainers
- It is interesting to note that the enhanced CBT participants spontaneously mentioned safety in their feedback and that they liked the eLearning.
- The least confident group were the enhanced CBT participants, which can be seen as a positive finding as increased confidence can have a negative road safety effect

- The questions on social norms and friends' willingness appeared to show movement in the wrong direction. However, it could be an indication that they are now more aware of the knowledge deficits of other young riders. This finding needs to be explored in more detail.
- Overall, the participant questionnaire results indicate that the enhanced CBT group often demonstrated learning not observed by the other groups. These findings include increase in knowledge about factors which affect riding; the importance of motorcycle maintenance; and improvements in attitudinal statements. These findings are not reflected across the other CBT groups.

Two-Day CBT

- Trainers were least confident delivering the two-day version of CBT
- Two-day CBTs needed to be delivered to certain clientele, with it being a waste of time for experienced riders
- The two-day syllabus enhanced the on-road ride, according to trainers
- The participant comments for the two-day version were also positive, with participants very aware that the two days they took to complete their CBT not being the usual allotted time. It is interesting to note that participants did not feel two days was too much and in fact, in one case, that it is still a short length of time.

Barriers

- There are practical issues with trying to deliver more than one CBT at the same site on the same day
- The cost of a two-day CBT is likely to be a barrier, although it could be promoted to parents
- There is a loss of income if only one person fits the criteria for a specific type of CBT
- Participants may not admit to needing a two-day course
- Some parents are not interested and may not insist on a two-day course
- A novice only CBT is not always financially viable and mixed groups do remind experienced riders of what they should be doing
- There is a need to guarantee completion of eLearning, perhaps with confirmation via DVSA to ATBs

Considerations

There are a number of considerations or suggestions to be reviewed when taking the recommended next steps:

- Social media is a useful recruitment and promotional tool, with registration levels directly linked to social media marketing
- The production of a certificate or code on completion of eLearning modules could be shared with ATBs, via DVSA to prove the student had done the pre-work
- There is a need to ensure trainers are testing eLearning knowledge through specific questions to be asked in enhanced CBT
- Communicate with parents, either by direct email or a message at the beginning of the eLearning modules, about the benefits of their child completing the eLearning and doing so independently
- Work with road safety partnerships on the promotion of the enhanced CBT and working with ATBs to deliver road safety messages
- Maintain the RideFree branding but change the address to co.uk (from .co) and to a secured site.
- Consider language barriers and how this would affect national roll out
- To revisit the two-day syllabus for those ATBs who would voluntarily offer it. There were suggestions about having more flexibility in the syllabus where the order could be changed if

necessary, so that confidence knocking incidents on the first day could be addressed on the second day. It would also be good to include rural roads, cornering and filtering in a two-day syllabus.

Next steps

There are a number of immediate next steps which should be followed before roll-out of any of the versions of CBT explored in this trial.

- 1** For DVSA to review the findings in this report, along with MCI and Highways England to consider endorsing wider roll-out of any of the versions.
- 2** For the greatest focus to be on the enhanced CBT with eLearning as the version with the greatest potential to have a positive effect and to be practically delivered
- 3** To revisit the content of the eLearning modules to provide clarity on specific topics and ensure that negative behaviours are in no way normalised
- 4** To revisit the content of the enhanced syllabus to provide additional content on specific topics and ensure trainers are testing the eLearning knowledge in the CBT
- 5** To produce a training pack for ATBs for the enhanced version, perhaps with a training video online, accessible via a secure area of the RideFree website
- 6** To consider funding options for the software and syllabus changes that would be required before the enhanced version of CBT is offered more widely
- 7** To explore the creation of an ATB support community to share best practice and provide opportunities for better engagement with road safety stakeholders
- 8** To devise a clear marketing strategy for the enhanced version, with support from DVSA, to encourage take up. Promotion to students could highlight that they are less likely to need two days to complete CBT; to ATBs that the students will be more responsive, and the CBT will flow better; and to parents, that their child will be better equipped to ride safely.

This report is comprised of four separate but related documents which take the reader from the starting point of identifying a collision issue through to piloting an intervention to address it. The reader is encouraged to read all four sections to understand the processes involved and the rationale behind the pilot intervention.

The sections are:

- RSA-17-319 P2W riders in the Eastern Region
- Motorcycling Service Delivery Review
- Young Riders Double Diamond
- RideFree Trial Findings

