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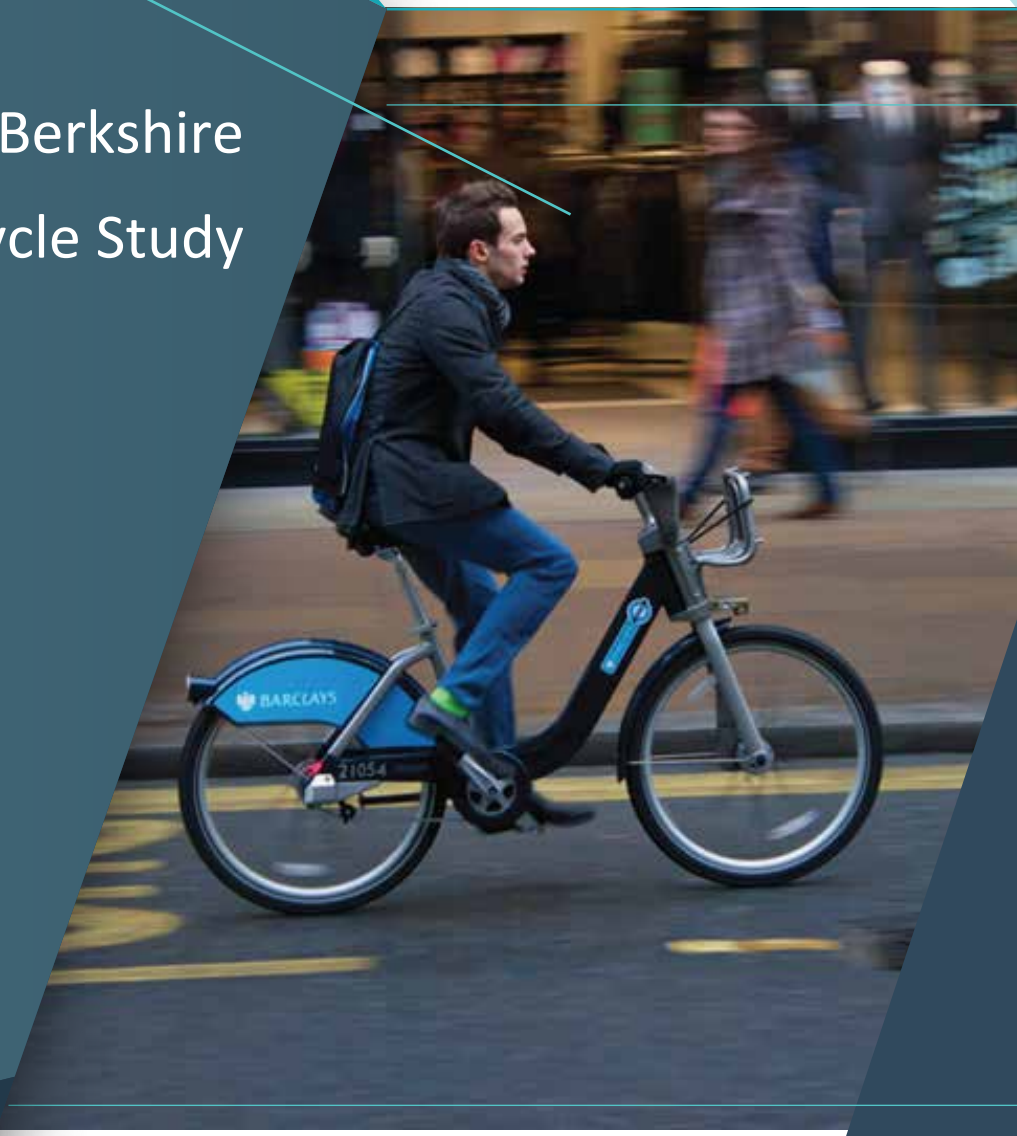
Safer Roads Berkshire
Pedal Cycle Study



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Insight Studies

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EXECUTIVE SUMMARY

The number of cyclists on the road of the UK and Berkshire has increased over the last decade and there has sadly also been a rise in cyclist injures. Although casualty totals in Great Britain reduced dramatically for car occupants, since 2009 we have witnessed consistent increases for cyclists. Perhaps more worryingly is the increase in the cyclist casualty rate which expresses how many cyclists are injured per mile cycled. When the 2013 to 2017 average is compared to the 2005-2009 figure, there was a 38% increase in the number of Berkshire resident pedal cyclist KSI casualties, and only an 18% increase in cycle traffic. Recent results from Berkshire show casualties who live in the authorities being injured as casualties in higher numbers than the 2008-2013 average. In 2017, there was one Berkshire resident killed as a pedal cyclist, 28 seriously injured and 153 slightly injured. Berkshire residents cycle more frequently that the English average.

This report sets out analysis undertaken on STATS19 collision data for 2013 to 2017, focusing on pedal cyclists from Berkshire who were involved in collisions. It focuses on the unitary authority members of Safer Roads Berkshire (SRB): Bracknell Forest, Royal Borough of Windsor and Maidenhead, Slough, West Berkshire and Wokingham. Authorities in Berkshire have observed that police reporting issues led to substantial reductions in the number of collisions reported since 2016. Because this study is based on a five-year cohort stretching back to 2013, the impact of these issues on its findings are likely to be limited, although the possibility of some effects cannot be entirely discounted. It is hoped that these issues will be addressed in the foreseeable future, so the validity of future studies is not compromised.

The risk factors for cyclists are quite clear. Weekdays at busy commuter times see the largest percentage of crashes with a larger peak in the morning. Only one in four cyclists are injured during the hours of darkness and almost all of these are in street lit areas. Unsurprisingly the cycling casualty numbers peak in the summer from April to November when weather conditions are more suitable for cycling. The large majority of cyclists are injured on unclassified roads, especially children, with T-junctions coming out high in terms of location. Interestingly cyclists are more likely to be injured when proceeding normally along the road (74%) i.e. not carrying out a manoeuvre. A more detailed look at the manoeuvres of other motor vehicles involved in the collisions show one-third are in the act of turning when collisions with cyclists occur.

The analysis of Berkshire resident casualties allows a wider look at casualty distributions in the area. There are concentrations of collisions in Slough and the two eastern authorities of Wokingham and Windsor and Maidenhead.

Cars make up the vast majority of vehicles involved in cyclist casualty collisions. When the individual parties' 'contributions' to crashes (commonly referred to as Contributory Factors) are reviewed, it is clear that cyclists are less often at fault. Only 55% of all cyclists were deemed to have contributed in some way to collisions compared to 60% of drivers. Both parties commonly make observation errors, with speed and other contraventions barely seen in the analysis.

The injured cyclists themselves are much more likely to be male than female and they make up 82 percent of the casualty records. There is a wide age range of resident cyclist casualties, from 11 to 49 years old, with a small peak between 45 and 49 years. Higher percentages of pedal cycle user

casualties live in Slough, the north of Windsor and Maidenhead, central Wokingham, central Bracknell Forest and wards around Newbury.

A review of the Mosaic classifications for resident cyclist casualties reveals Group D, *Domestic Success*, as being highest in terms of numbers, and slightly over-represented based on population. This Group share many characteristics with the overall casualty analysis: they tend to be from the same age group of 45 to 40 years old and are in full-time employment, hence the morning rush hour peak. Whilst they do own a car, they are also cycle owners and key on fitness, so perhaps choose to cycle to work for exercise purposes. A review of the Index of Multiple Deprivations scores for casualties does show that the casualties tend to come from the least deprived areas, although there are small, over-represented numbers who live in the most deprived 30% locations.

Although this Insight Study has clearly focussed on specific risk factors, it must be made clear that the benefits of cycling outweigh the risks and this should be born in mind when promoting safe cycling. Everyday cycling, like walking, is a low-risk activity and one where the health benefits outweigh the risk of injury by 20:1 or more. People who cycle regularly live longer, on average, than people who do not, with healthier lives and less illness. As more people cycle, roads will be less congested and there will be less pollution. However, the change to a cycling culture is a long way off. Cycling rates will need to increase thirty times in England to achieve the same levels as in The Netherlands. The safety effect of 'cycling in numbers' requires a large modal shift and small percentage changes will not reduce injury rates.

Engaging with the cyclists from Berkshire and on its roads will not be straightforward. The population of cyclists is largely a pioneer species; generally fit, experienced, capable, and cycling as much through choice as necessity. The approaches adopted should be sophisticated and in tune with the attitude already present in the population. Simplistic messages about cycle light and high-visibility clothing are unlikely to be successful, and basic training courses will not be suitable for those already cycling. Recognising the status of cyclists and their skill set could help, especially in reinforcing safe cycling behaviour. Informing motorists of how cyclists ride in busy urban environments and where to watch out for increased cycling numbers could achieve some success.

Four persons emerged from the analysis, for whom engagement should be targeted: *Howard* who is in his early 60s, affluent and cycles for leisure and exercise purposes; *Jonathan* who in his early 40s and who commutes to work on his cycle, for environmental and fitness reasons. He works in the finance industry and is ambitious; *Saeed* is a teenager from a deprived multicultural household, whose family does not own a car and so he cycles for cost reasons; and *Jordan*, in his 30s and from a deprived background who cycles to work and is involved in collisions on his commute. The diverse nature of the personas suggest that a tailored approach ought to be adopted.

INTRODUCTION

Cycling as an activity has moved into the spotlight in recent years as a result of a combination of factors: the success of British sports cyclists at the London 2012 Olympics and in the Tour de France; reported increased use of the National Cycle Network (thought to be for economic reasons[1]); the promotion of regular cycling to improve health and fitness[2]; and not least The Times cycle safety campaign, pushing for safer cycling infrastructure in towns and cities.[3] There is a fine balance to be managed between these messages: there are huge public health benefits to be gained from increasing the activity levels of the British public. However, there is a need to ensure that those taking up or returning to cycling are doing so in the safest manner. There is a danger though, that over-emphasising the risks of cycling could deter people from embarking on the activity. This analysis seeks to put the collision risks into context and explain the circumstances which led to cyclists from Berkshire being injured, with a view to aiding practitioners to promote cycling whilst reducing risk levels.

In 2008, there were 2,065 pedal cyclists killed in road collisions in the EU-23 countries. In Great Britain, in 2017, there were 101 pedal cyclists killed in road collisions and a further 3,698 seriously injured and 14,522 slightly injured.

Figure 1 puts the pedal cycle casualties for Great Britain in context. It shows the number of pedal cycle casualties, by severity, since 1979 in the bars, and the red line indicates the KSI casualty involvement rate per billion vehicle miles[4]. It shows a general downward trend of casualties until 2001, when the numbers plateaued before starting to rise in 2010. Serious casualties have increased from 2,502 in 2008 to 3,698 in 2017. The number of pedal cycle casualties slightly injured has also increased from 13,920 in 2008 to 14,522 in 2017. There has been little change in the KSI casualty rate per billion vehicle miles since 2001; on average, there are 1,062 pedal cycle casualties killed or seriously injured per billion vehicle miles ridden.

FIGURE 1 - GB PEDAL CYCLE CASUALTIES BY SEVERITY AND CASUALTY RATE PER BILLION VEHICLE MILES

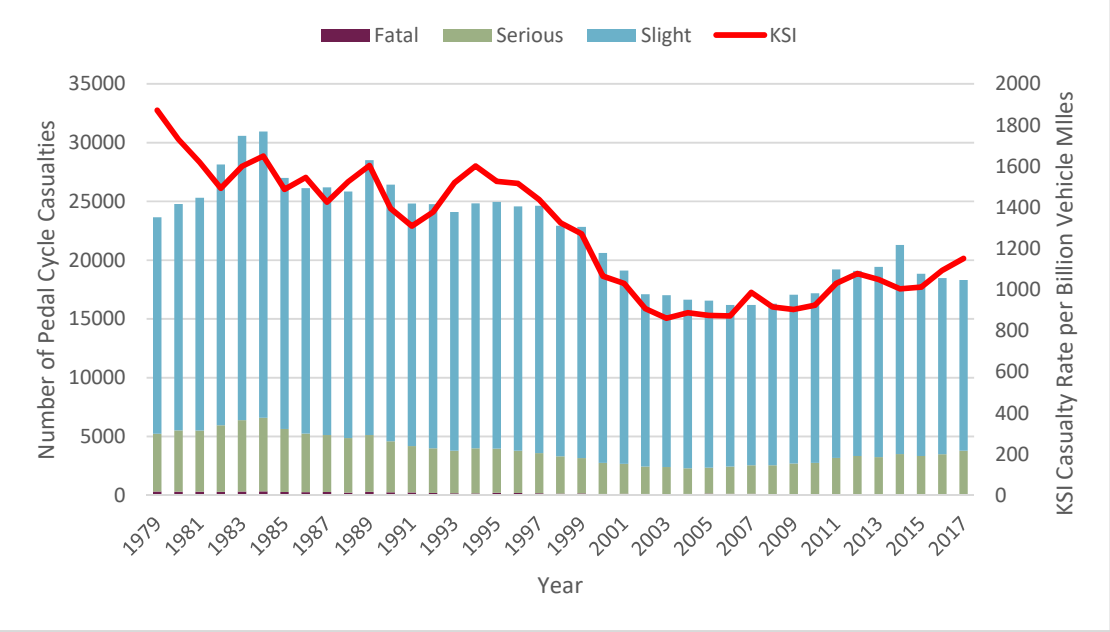


Table 1 shows the 5 year average number of GB cycle casualties and pedal cycle traffic for four time periods: 1979-1983 (the earliest data supplied in the Department for Transport's *Reported Road Casualties Great Britain 2012*); 1994-1998 (which was the baseline period for the 2010 road casualty targets); 2005-2009 (used as the baseline for current casualty monitoring); and 2013-2017 (the most recently published data). The table also compares the most recent time period to the previous three.

It shows that there was a 39% reduction in the average number of KSI cycle user casualties in 2013-2017 compared to 1979-1983. However, there was also a 6% reduction in pedal cycle traffic, compared to 1979-1983 so the fall in cycling casualties was accompanied by a smaller fall in cycling rates. Compared to 1994 to 1998, in 2013-2017, there was a 7% reduction in KSI casualties at the same time as there was also a 30% increase in pedal cycle traffic. When the 2013 to 2017 average is compared to the 2005-2009 average, there was a 38% increase in the number of KSI casualties, although this was accompanied by an 18% increase in cycle traffic.

TABLE 1 – 2013-2017 AVERAGE GB CYCLE USER CASUALTIES AND PEDAL CYCLE TRAFFIC COMPARED TO OTHER TIME PERIODS

Time Period	Fatal	Serious	KSI	Slight	Total	KSI Rate per Billion Vehicles	All Rate per Billion Vehicles	Pedal Cycle Traffic
79-83 Ave	310	5,419	5,729	20,762	26,491	1,662	7,662	3.48
94-98 Ave	186	3,546	3,732	20,653	24,385	1,481	9,677	2.52
05-09 Ave	130	2,398	2,528	13,934	16,463	910	5,931	2.78
13-17 Ave	105	3,376	3,481	15,793	19,273	1,062	5,878	3.28
Difference to 79-83	-66.1%	-37.7%	-39.2%	-23.9%	-27.2%	-36.1%	-23.3%	-5.7%
Difference to 94-98	-43.5%	-4.8%	-6.7%	-23.5%	-21.0%	-28.3%	-39.3%	30.2%
Difference to 05-09	-19.1%	40.7%	37.7%	13.3%	17.1%	16.6%	-0.9%	18.0%

This report sets out analysis undertaken using STATS19 collision data for 2013 to 2017 from MAST, an online analysis tool which combines casualty and collision data from the Department for Transport with socio-demographic insights created by Experian through Mosaic Public Sector. The postcodes of drivers and casualties involved in collisions are used to determine which Mosaic *Groups* these individuals are likely to belong to, and this can be used by road safety professionals to understand who needs to be targeted in road safety interventions. The report looks at pedal cycle casualties from Berkshire who have been injured in collisions anywhere in the country. The intention of this report is to provide the road safety practitioner in Berkshire with a full understanding of the types of collision involving pedal cyclists and to equip them with the tools to target the issue. The report works through the analysis by first determining the extent to which cyclists from Berkshire are involved in collisions and in what context they are involved. The location of the collisions will be examined to determine if the cyclists are involved in collisions on Berkshire roads or elsewhere in the country.

Other factors, such as when, where and how the cyclists were involved in collisions are explored to provide information on the topics and issues that could be focused upon within an intervention.

A large part of the analysis focuses on profiling the pedal cyclists, with the aim of producing 'personas' that can be used to visualise the target audience. These personas are created using a variety of socio-demographic data, including looking at Indices of Multiple Deprivation, rurality and Mosaic Groups. Profiling in this way allows the practitioner to understand how pedal cyclists will respond to a road safety intervention and in what way it should be delivered.

RISK PROFILE

This profile covers two distinct areas: information about the collision and information about the person involved. Both are relevant to the analysis and are considered separately.

The collision analysis looks at pedal cycle user casualties from Berkshire (authorities including Bracknell Forest, Windsor and Maidenhead, Slough, West Berkshire and Wokingham; excluding Reading) who were injured in collisions between 2013 and 2017. Authorities in Berkshire have observed that police reporting issues led to substantial reductions in the number of collisions reported since 2016. Because this study is based on a five-year cohort stretching back to 2013, the impact of these issues on its findings are likely to be limited, although the possibility of some effects cannot be entirely discounted. It is hoped that these issues will be addressed in the foreseeable future, so the validity of future studies is not compromised.

Looking at residency, 78% of the pedal cycle user casualties injured in collisions in Berkshire live in Berkshire[1]. Looking at the reverse analysis, 79% of pedal cycle user casualties from Berkshire are involved in collisions on Berkshire's roads. It is appropriate to focus on Berkshire residents for this analysis for two reasons though. Firstly, approximately two thirds of the cyclists involved in collisions are from Berkshire and therefore targeting residents will reduce the collision rates on the Borough's roads. Secondly, the Borough has a responsibility to improve the safety of the citizens of Berkshire, regardless of where they subsequently crash.

COLLISION PROFILES

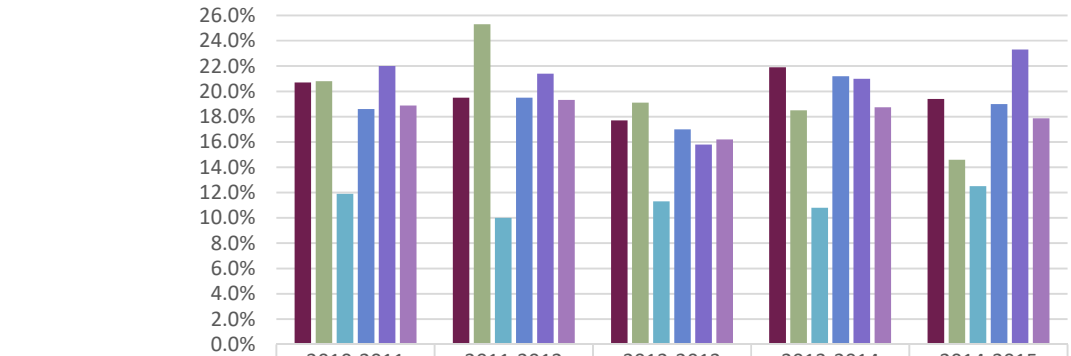
WHAT?

According to the Active People Survey[5] published in June 2015, 18% of Berkshire residents cycle at least once a month. This varies from 3% of cyclists who cycle for any length or purpose five times a week to 18% who cycle once a month. This is 20% higher than the rate for the whole of England (15%). Figure 2 shows that there is not much of a variation in the proportions of Berkshire residents who cycle at the various frequencies over the years. However, there is a high variation between the different boroughs for example Slough and Bracknell Forest.

[1] As a percentage of all casualties who can be matched to a home location. There will also be a significant number where the home location is unknown.

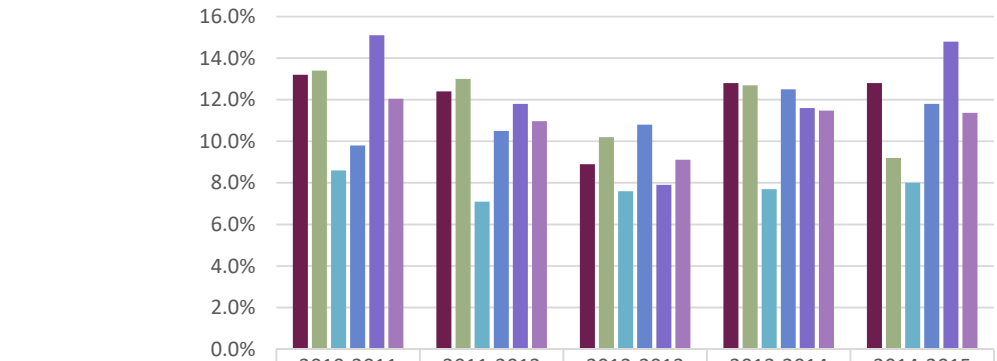
FIGURE 2 – PROPORTION OF BERKSHIRE RESIDENTS WHO CYCLE (ANY LENGTH OR PURPOSE) AT A GIVEN FREQUENCY[6]

PER MONTH



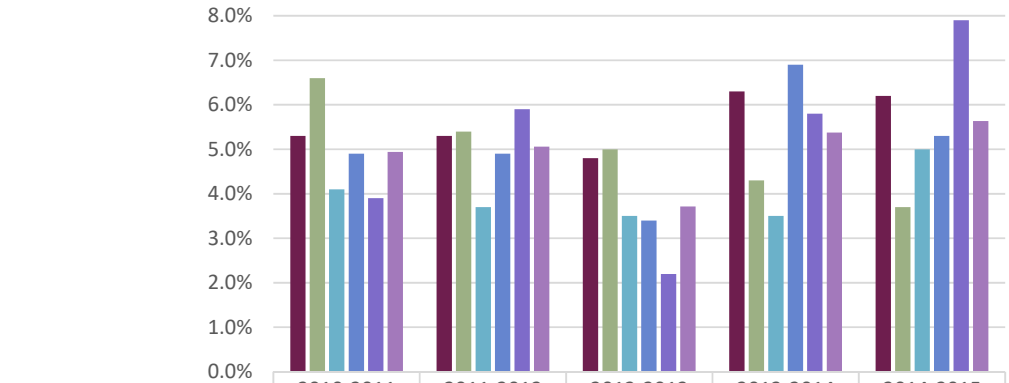
	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015
Bracknell Forest	20.7%	19.5%	17.7%	21.9%	19.4%
Windsor and Maidenhead	20.8%	25.3%	19.1%	18.5%	14.6%
Slough	11.9%	10.0%	11.3%	10.8%	12.5%
West Berkshire	18.6%	19.5%	17.0%	21.2%	19.0%
Wokingham	22.0%	21.4%	15.8%	21.0%	23.3%
Total %	18.9%	19.3%	16.2%	18.7%	17.9%

1 X PER WEEK



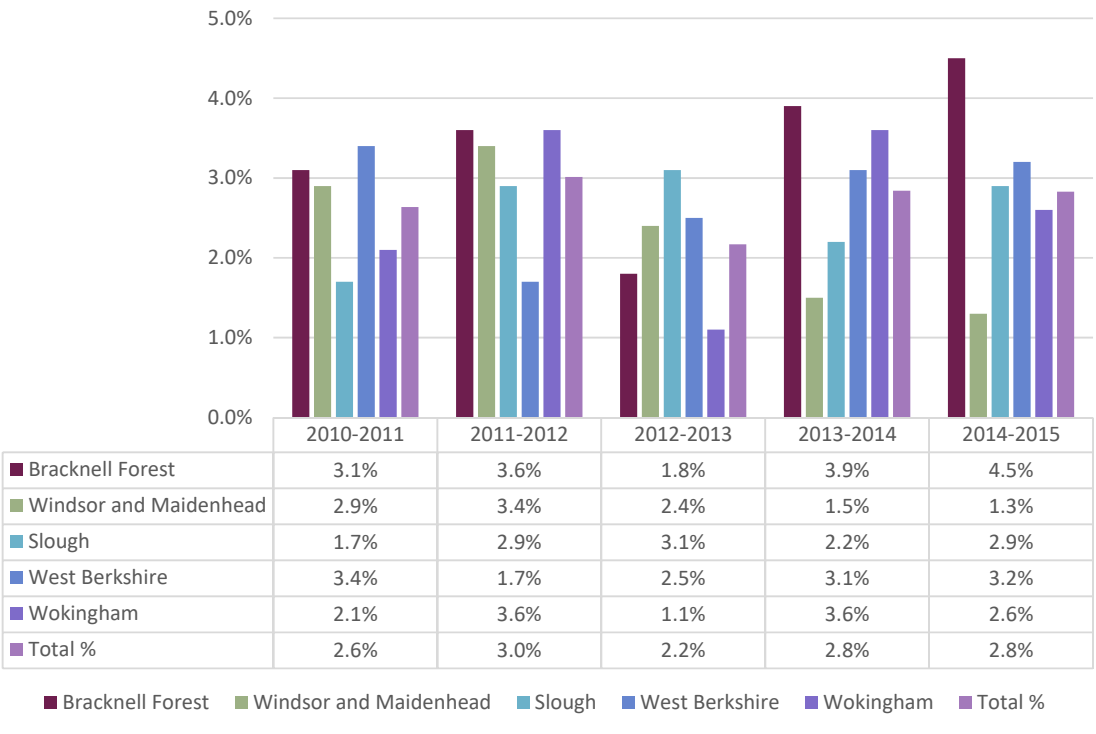
	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015
Bracknell Forest	13.2%	12.4%	8.9%	12.8%	12.8%
Windsor and Maidenhead	13.4%	13.0%	10.2%	12.7%	9.2%
Slough	8.6%	7.1%	7.6%	7.7%	8.0%
West Berkshire	9.8%	10.5%	10.8%	12.5%	11.8%
Wokingham	15.1%	11.8%	7.9%	11.6%	14.8%
Total %	12.0%	11.0%	9.1%	11.5%	11.4%

3 X PER WEEK



	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015
Bracknell Forest	5.3%	5.3%	4.8%	6.3%	6.2%
Windsor and Maidenhead	6.6%	5.4%	5.0%	4.3%	3.7%
Slough	4.1%	3.7%	3.5%	3.5%	5.0%
West Berkshire	4.9%	4.9%	3.4%	6.9%	5.3%
Wokingham	3.9%	5.9%	2.2%	5.8%	7.9%
Total %	4.9%	5.1%	3.7%	5.4%	5.6%

5 X PER WEEK



	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015
Bracknell Forest	3.1%	3.6%	1.8%	3.9%	4.5%
Windsor and Maidenhead	2.9%	3.4%	2.4%	1.5%	1.3%
Slough	1.7%	2.9%	3.1%	2.2%	2.9%
West Berkshire	3.4%	1.7%	2.5%	3.1%	3.2%
Wokingham	2.1%	3.6%	1.1%	3.6%	2.6%
Total %	2.6%	3.0%	2.2%	2.8%	2.8%

Between 2013 and 2017, pedal cycle user casualties accounted for 18% of all Berkshire resident KSI casualties. The actual numbers are shown in Table 2. These pedal cycle users (riders and passengers) are those who live in Berkshire and who were involved in collisions anywhere in the country (including in Berkshire itself). Comparisons with casualties from anywhere in Great Britain have been made and 100-based indices have been created. Where casualties from Berkshire are over-represented in collisions compared to GB as a whole, there is a value in the last column which is over 100. This is the case for pedestrians, motorcyclists and cyclists.

TABLE 2 – 2013-2017 CASUALTIES FROM BERKSHIRE BY CASUALTY CLASS/RELATED VEHICLE

	Fatal	Serious	Slight	Total	% of All KSI	% of All	GB Index
Drivers	48	823	5,940	6,811	73%	72%	112
Passengers	9	126	1,617	1,752	11%	19%	83
Pedestrians	18	164	723	905	15%	10%	73
Pedal Cycle User Casualties*	**4**	**206**	**884**	**1094**	**18%**	**12%**	**110**
Car Occupants	29	389	5622	6040	35%	64%	107
Motorcycle User Casualties	22	316	884	1094	18%	12%	110

Table 3 shows the road users who were injured in collisions on Berkshire's roads, by vehicle type. These casualties could live anywhere in the country. As before, compared to the whole of Great Britain, pedestrians, motorcyclists and pedal cyclists are all slightly over-represented on Berkshire's roads.

TABLE 3 – 2013-2017 CASUALTIES ON BERKSHIRE'S ROADS BY VEHICLE TYPE

	Fatal	Serious	Slight	Total	% of All KSI	% of All	GB Index
Car	53	551	6617	7,221	50%	73%	103
Motorbike	14	318	667	999	28%	10%	90
Goods	6	52	414	472	5%	5%	111
Bus		3	82	85	0%	1%	28
Cycle	**7**	**196**	**928**	**1131**	**17%**	**11%**	**105**

The numbers of Berkshire resident pedal cycle user casualties are shown in
Figure 3 (and Table 4), by severity, in the columns. The red line shows the 2008-2012 average number of injured pedal cyclists. It shows that there were small numbers of cyclists killed or seriously injured and overall, the numbers of Berkshire resident pedal cycle user casualties were fairly stable until 2011, since then there have been increases, with a peak in 2014. However, there is a decrease in 2017.

Figure 3 - Number of Berkshire resident cyclists by severity, compared to the 2008-12 Berkshire Resident cyclists average

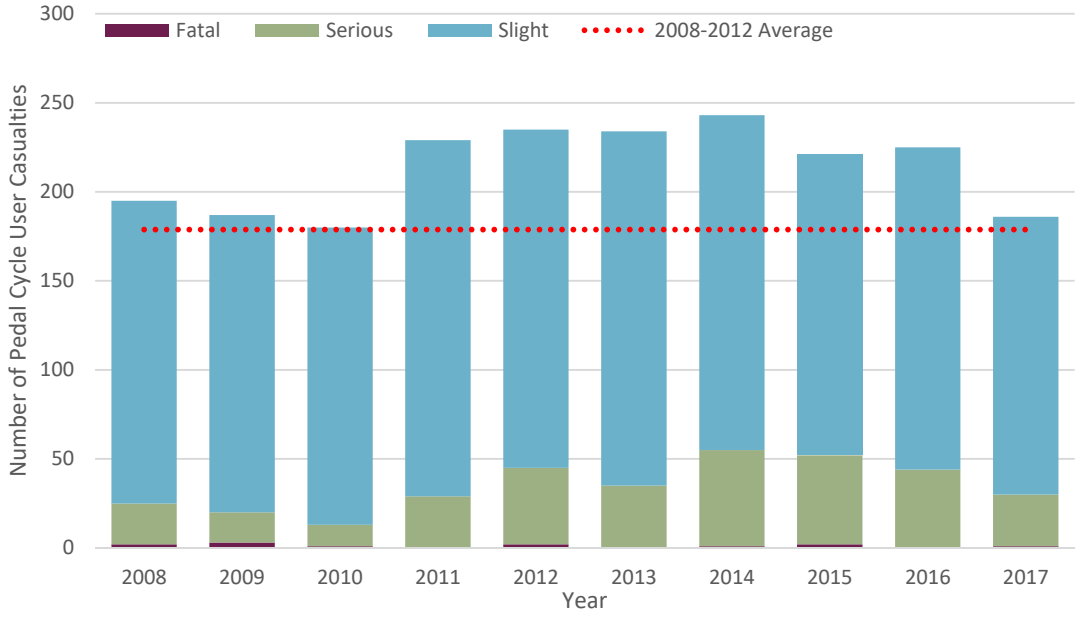


TABLE 4 - NUMBER OF BERKSHIRE RESIDENT CYCLISTS BY SEVERITY

Year	Fatal	Serious	KSI	Slight	Total
2008	2	22	24	168	192
2009	3	16	19	166	185
2010	1	11	12	166	178
2011	0	29	29	197	226
2012	2	42	44	187	231
2013	0	33	33	199	232
2014	1	52	53	185	238
2015	2	49	51	167	218
2016	0	44	44	180	224
2017	1	28	29	153	182

Table 5 shows the number of pedal cyclists injured in Berkshire over the same time period.

TABLE 5 - NUMBER OF CYCLIST CASUALTIES IN BERKSIRE BY SEVERITY

Year	Fatal	Serious	KSI	Slight	Total
2008	0	32	32	189	221
2009	3	16	19	170	189
2010	1	16	17	160	177
2011	0	32	32	209	241
2012	2	35	37	192	229
2013	0	34	34	191	225
2014	3	39	42	173	215
2015	2	41	43	190	233
2016	0	47	47	204	251
2017	2	28	30	158	188

In order to understand whether or not the increases in Berkshire resident pedal cycle casualties (up to 2017) is part of a general trend or unique to the Berkshire authorities, comparisons have been made with Great Britain as a whole (as well as showing the number of cycle casualties on Berkshire's roads). These are shown in Figure 4 overleaf. For all areas, 2008 has been used as a starting point and 100-based indices created to show how each subsequent year compares to the numbers of pedal cycle user casualties in 2008.

The chart shows that there was an increase in the GB trend compared to 2008 until 2014, when the number of casualties started to decrease. This replicates the analysis shown in Figure 1 in the Introduction. This analysis does not take into account bicycle ownership. For Berkshire residents, there has been a clear upward trend in pedal cycle user casualties and then a decrease from 2014, in common with GB as a whole.

The numbers of cycle casualties on Berkshire's roads have also increased over the time period, although the upward trend is not as pronounced as for Berkshire residents. There were 14% fewer riders involved in collisions on Berkshire's roads in 2017 than in 2008 (without taking in ownership into account). However, the limitations with the 2017 data need to be accounted for when considering this analysis.

FIGURE 4 - RESIDENT PEDAL CYCLE USER CASUALTY INDICES, WITH 2008 AS BASE

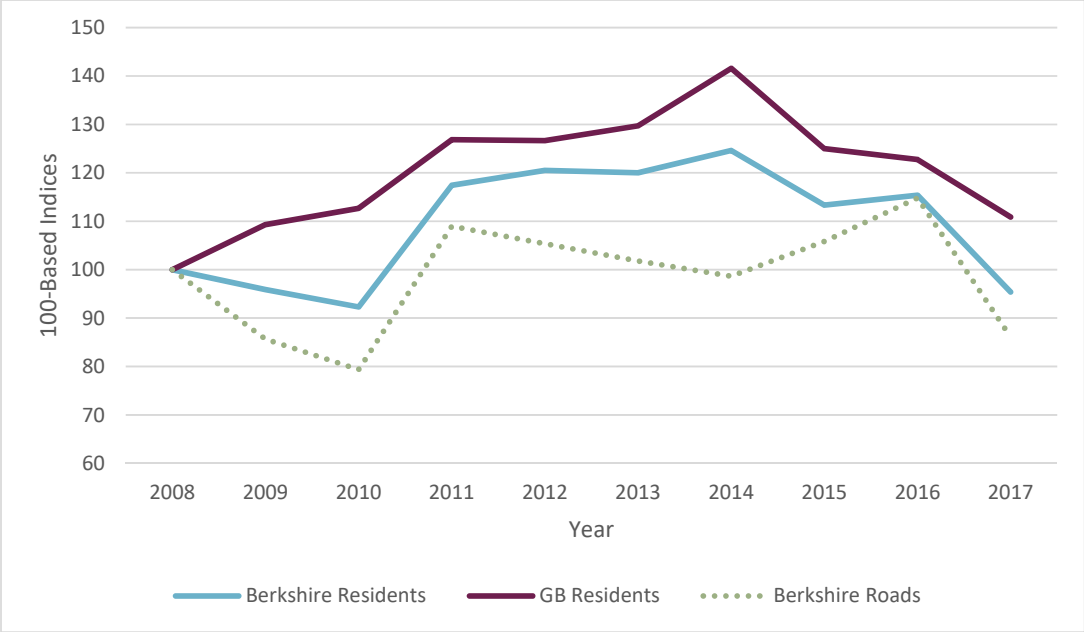


TABLE 6 – PEDAL CYCLE USER CASUALTIES AS A PERCENTAGE OF BERKSHIRE AND GB RESIDENT CASUALTIES (CHILDREN)

Year	Berkshire Residents			GB Residents		
	Child Pedal Cycle Casualties	All	%Pedal Cycle	Child Pedal Cycle Casualties	All	%Pedal Cycle
2008	51	170	30.0%	3306	21996	15.0%
2009	40	155	23.5%	3204	20655	14.6%
2010	29	175	17.1%	2828	19569	12.9%
2011	34	170	20.0%	2881	19474	13.1%
2012	30	166	17.6%	2198	17251	10.0%
2013	27	147	15.9%	1958	15756	8.9%
2014	29	154	17.1%	2005	16727	9.1%
2015	20	143	11.8%	1929	16103	8.8%
2016	36	165	21.2%	1981	15976	9.0%
2017	27	119	15.9%	2211	15721	10.1%

TABLE 7 – PEDAL CYCLE USER CASUALTIES AS A PERCENTAGE OF BERKSHIRE AND GB RESIDENT CASUALTIES (ADULTS)

Year	Berkshire Residents			GB Residents		
	Adult Pedal Cycle Casualties	All	%Pedal Cycle	Adult Pedal Cycle Casualties	All	%Pedal Cycle
2008	141	1896	7.4%	12991	208909	6.2%
2009	145	1924	7.5%	13860	201491	6.6%
2010	149	1818	8.2%	14357	189079	6.9%
2011	192	1888	10.1%	16334	184476	7.8%
2012	201	1813	11.1%	16893	178472	8.1%
2013	205	1740	11.8%	17480	167914	8.4%
2014	209	1694	12.3%	19282	177750	9.2%
2015	198	1714	11.6%	16915	170086	8.1%
2016	188	1622	11.6%	16496	165408	7.9%
2017	155	1283	12.1%	16110	155272	7.7%

Table 6 shows the number of Berkshire child resident pedal cycle user casualties injured each year, the total number of Berkshire child resident casualties (of any mode) and the percentage of the total which are cyclists. This is also shown for Great Britain. For children, it shows that there are a relatively small number of pedal cycle casualties among Berkshire residents and that there is fluctuation in the percentages of all child casualties that pedal cyclists represent. Table 7 shows the same information for adult residents of Berkshire. It shows that the proportion of Berkshire residents who are injured as pedal cyclists has increased in recent years (aside from 2017, with the data issue) and a similar trend has also occurred elsewhere in Great Britain. This suggest that the numbers of adult pedal cycle casualties in general are increasing, and this is not just a Berkshire issue.

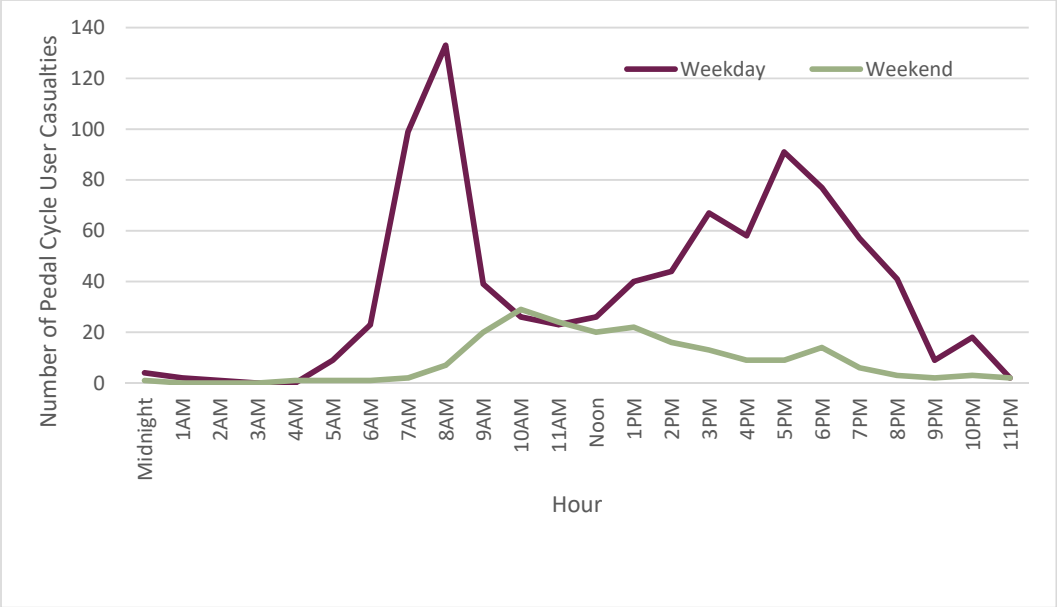
The two tables also show that 87% of the resident pedal cycle user casualties injured between 2013 and 2017 were adults. The analysis will combine child and adult casualties until the Pedal Cycle User Casualties Profiles on page 25, which will then focus on adult cyclists.

WHEN?

This section of the analysis looks at when Berkshire resident pedal cycle user casualties were injured in collisions between 2013 and 2017.

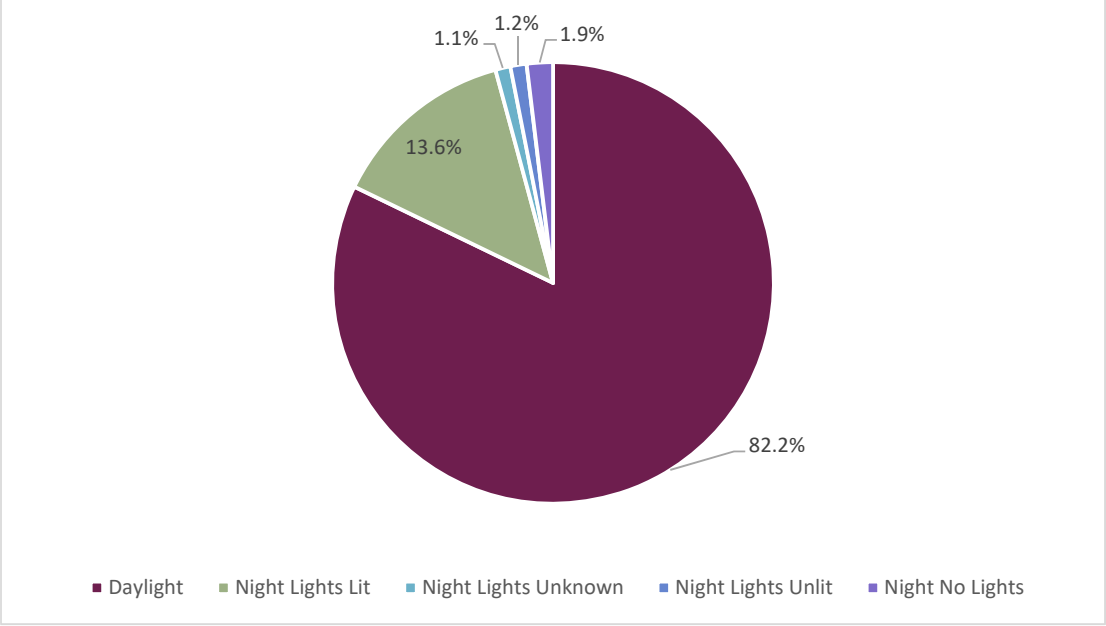
There are definite peaks in collision involvement amongst Berkshire pedal cycle user casualties in commuter periods, as shown in Figure 5. The morning peak is higher, with 22% of cyclists involved in collisions on any day of the week being injured between 7am and 9am.

FIGURE 5 – TIME OF DAY WHEN BERKSHIRE RESIDENT PEDAL CYCLE USER CASUALTIES ARE INJURED



Related to time of day analysis is lighting conditions. Given the high instance of commuter period involvement amongst Berkshire resident pedal cycle user casualties, it is not surprising to see that three-quarters were involved in collisions in daylight (82% of cycle casualties on Berkshire's roads were also injured in daylight).

FIGURE 6 - LIGHTING CONDITIONS FOR BERKSHIRE RESIDENT PEDAL CYCLE USER CASUALTIES



The days of the week on which pedal cycle user casualties were injured are shown in figure 7. It shows that pedal cyclists are more likely to be injured in the middle of the working week and least likely at weekends. This pattern holds true for casualties on Berkshire's roads.

FIGURE 7 – DAY OF WEEK WHEN PEDAL CYCLISTS FROM BERKSHIRE ARE INJURED

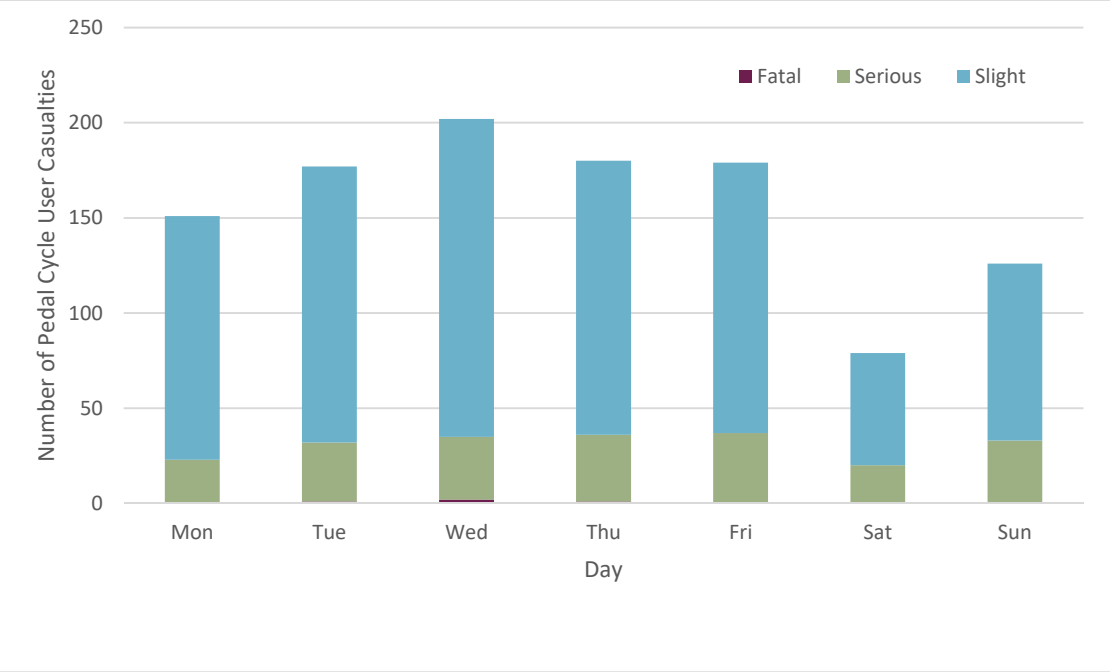
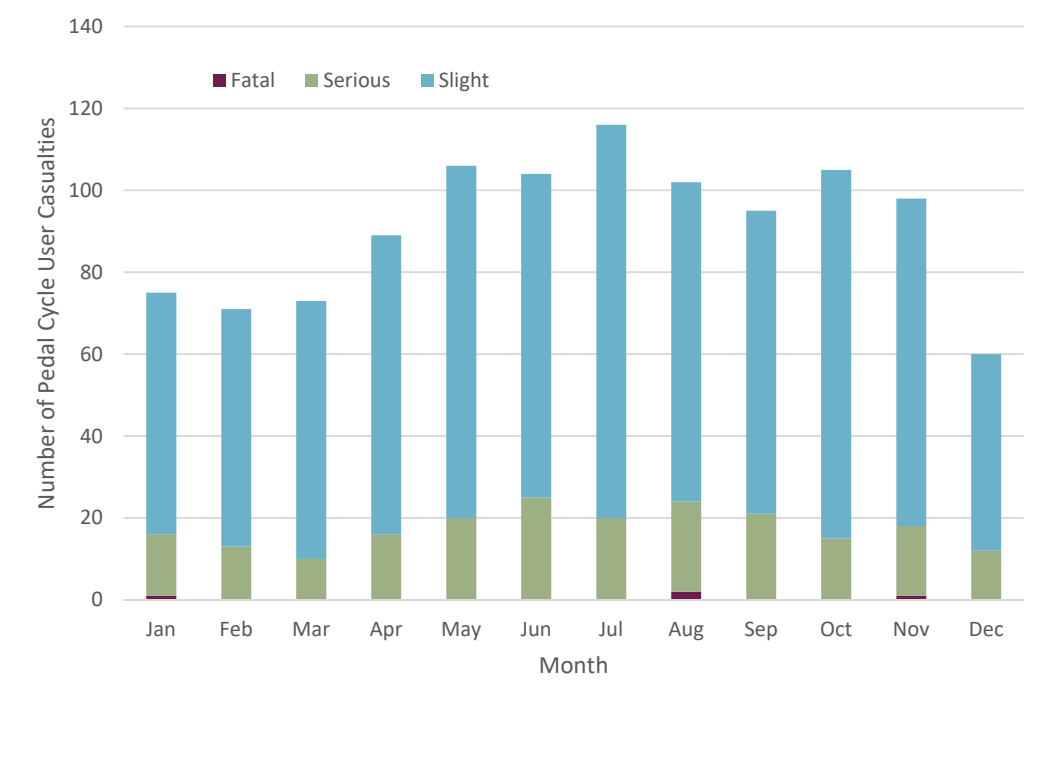


FIGURE 8 - MONTH OF YEAR WHICH BERKSHIRE PEDAL CYCLE USER CASUALTIES WERE INJURED



The month of the year in which the pedal cycle user casualties were injured was analysed (Figure 8). It shows a peak in the spring/summer/autumn months of April through to November. These peaks are likely to be related to the amount of cycle traffic, rather than any specific threats posed at different

time of the year. For example, in winter, road conditions tend to be poorer with reduced visibility, but cycling traffic would also be expected to dip at these times, certainly among more casual cyclists. The same peaks are observable amongst cycle casualties injured on Berkshire's roads.

The weather conditions at the time the pedal cyclists were injured were examined (Table). Most of the pedal cyclists (88.7%) were involved in collisions in fine and still weather. This percentage is slightly higher than for all Berkshire resident vehicle occupant casualties (84%) and could suggest that some cyclists choose not to ride in adverse weather.

TABLE 8- WEATHER CONDITIONS WHEN BERKSHIRE PEDAL CYCLISTS WERE INJURED

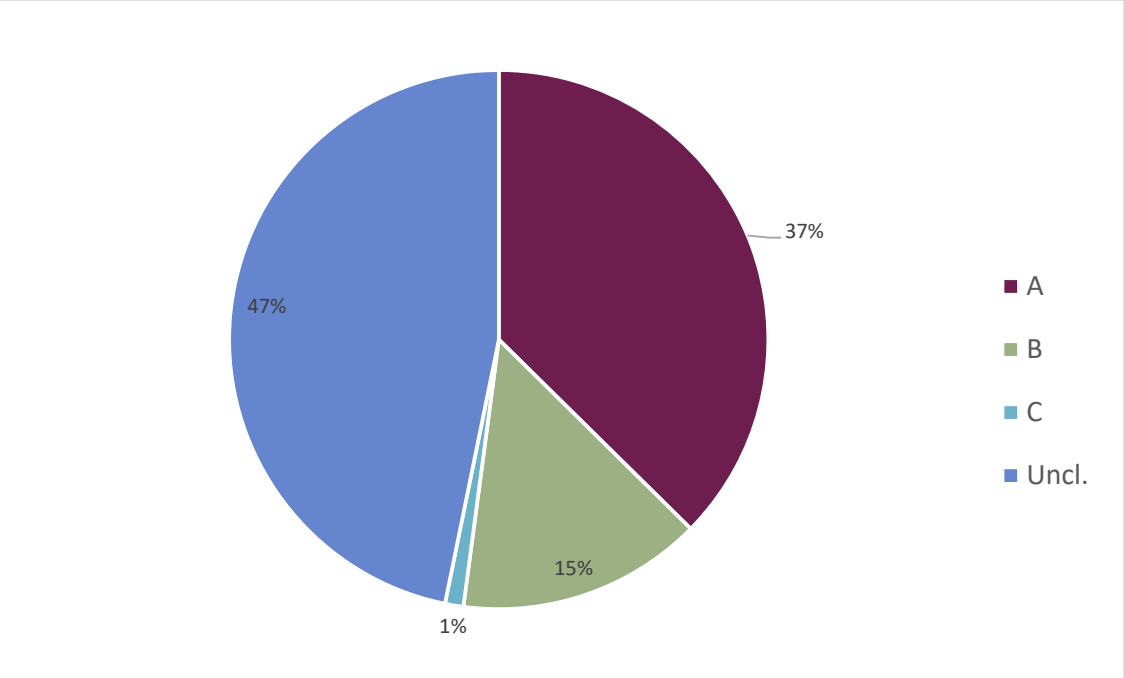
Weather Conditions	Fatal	Serious	KSI	Slight	Total
Fine & Windy	0	2	2	7	9
Fog & Mist	0	0	0	3	3
Other	0	2	2	15	17
Wet & Still	0	15	15	60	75
Wet & Windy	0	1	1	4	5
Fine & Still	4	183	187	783	970
Not Known	0	3	3	12	15

Associated with weather is the road surface condition. Most of the pedal cyclists (80%) were on dry roads at the time of their collision, with a further 18% on wet or damp road surfaces.

WHERE?

The next section looks at the road characteristics of where Berkshire resident pedal cycle user casualties were involved in collisions. In terms of road class, 37% of the pedal cycle user casualties were on 'A' roads at the time of their collision, with 47% on unclassified roads. There were some differences by age: only 21% of children were on A roads with a further 71% on unclassified roads. However, it should be remembered that the number of child pedal cycle user casualties is small.
The distributions of pedal cycle casualties injured on different classes of Berkshire's roads are similar to those of Berkshire residents.

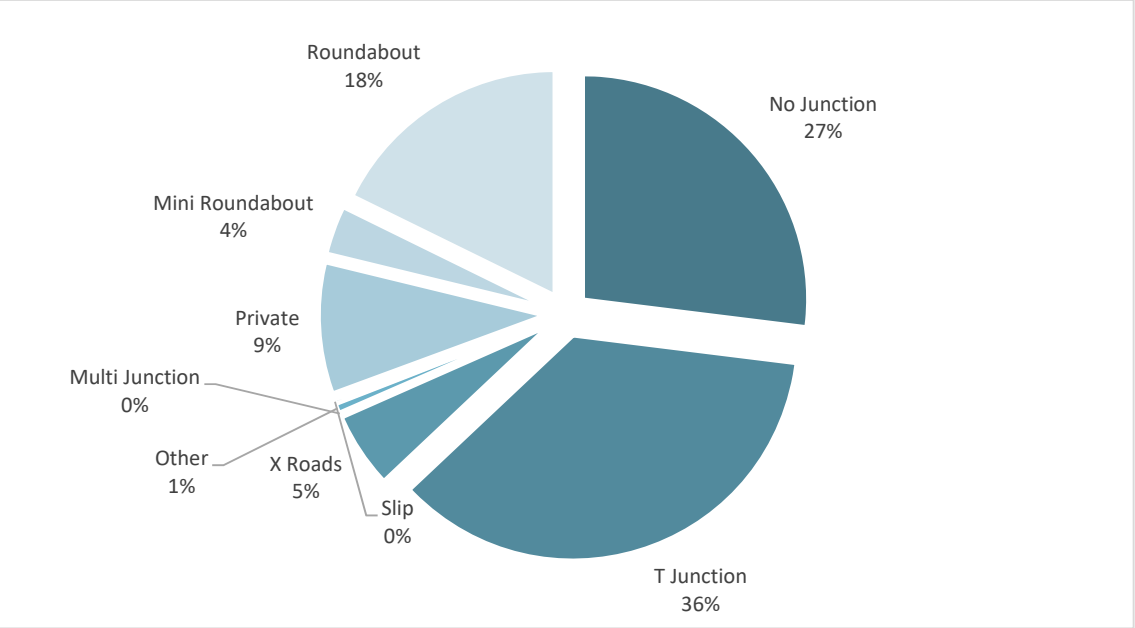
FIGURE 9 – ROAD CLASS OF WHERE THE PEDAL CYCLE USER CASUALTIES ARE INVOLVED IN COLLISIONS



A large number of pedal cycle user casualties were involved in collisions on 30mph roads (73%). Similarly, 71% of cycle casualties injured on Berkshire's roads were on 30mph roads. Berkshire resident pedal cycle user casualties tend to be on single carriageway roads at the time of their collision (74%), with a further 19% on roundabouts. This is the same as for casualties on Berkshire's roads.

Junction details were also analysed and are displayed in Figure 10. Thirty-six of the Berkshire pedal cycle user casualties were at T-junctions at the time of their collision. (For casualties on Berkshire's roads, this was 35%). This might indicate issues with visibility (in that other vehicles approaching the junction are pulling out into the path of the pedal cyclists without looking properly/seeing the cyclist), or that the cyclists themselves are exiting junctions into the path of oncoming vehicles. Furthermore, there have been well-reported incidents involving heavy goods vehicles turning left at junctions whilst the cyclist is on the inside of the junction.[7] Manoeuvre analysis, discussed in detail later in the How? section, shows that 74% of the cyclists were travelling straight ahead, implying that the other involved vehicles were emerging from the junctions or were turning, not the cyclist.

FIGURE 10 – JUNCTION DETAILS OF BERKSHIRE RESIDENT PEDAL CYCLE USER CASUALTIES



The junction control where the pedal cycle user casualties were involved in collisions were analysed. Overall, 65% of cyclists from Berkshire were involved in collisions at Give Way or uncontrolled junctions and a further 26% were at stop signs. For casualties on Berkshire's roads, 67% were at Give Way or Uncontrolled and 7% at automatic traffic signals.

TABLE 8 – JUNCTION CONTROL WHERE THE PEDAL CYCLISTS WERE INVOLVED IN COLLISIONS

	Berkshire
Authorised person	0%
Automatic traffic signal	8%
Give Way or Uncontrolled	65%
Stop sign	27%
Not at junction	1%

Analysis of the top wards where pedal cycle user casualties from Berkshire were involved in collisions is shown in Figure 6. The wards are colour-coded by percentage of resident pedal cyclists who crashed there. The map shows that there were concentrations of Berkshire pedal cyclists crashing in the Slough wards of Farnham and Chalvey. There were also concentrations of collisions throughout Slough and in eastern authorities of Windsor and Maidenhead (especially Bray, Oldfield, Clewer North, Belmot, Furze Platt and Castle Without) and Wokingham (Maiden Erlegh and Winnersh).

FIGURE 6 - WARDS WHERE BERKSHIRE PEDAL CYCLE USER CASUALTIES WERE INVOLVED IN COLLISIONS

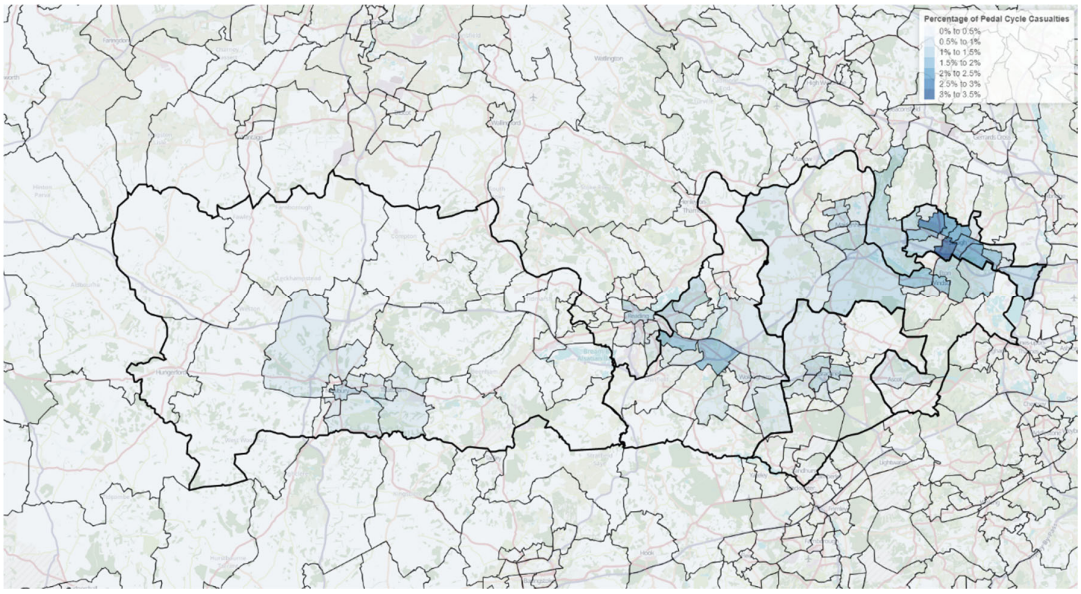


TABLE 9 - NUMBER OF PEDAL CYCLE USER CASUALTIES FROM BERKSHIRE BY ROUTE

Route	Berkshire	
	Number	Percentage
Unclassified/C Roads	524	49%
A4	141	14%
A329	71	8%
A308	35	4%
A3555	15	2%
B470	14	2%

TABLE 10 - NUMBER OF PEDAL CYCLE USER CASUALTIES IN BERKSHIRE BY ROUTE

Route	Berkshire	
	Number	Percentage
Unclassified/C Roads	534	48%
A4	155	14%
A329	89	8%
A308	47	4%
A355	23	2%
B470	21	2%

In addition to mapping the wards where residents from Berkshire are injured in collisions as cyclists, it is possible to analyse the routes where they crashed. Table 9 shows the number of pedal cyclists from Berkshire who were involved in collisions on specific routes. These riders could have been involved in collisions on these routes outside of the Berkshire authorities. The highest percentage of riders were on unclassified routes and the top 5 specified routes are: A4 (14%), A329 (8%), A308 (4%), A355 (2%) and B470 (2%).

Table 10 shows the number of pedal cycle casualties injured in routes in Berkshire. Unclassified roads and the A4, A329 and A308 feature prominently.

HOW?

After looking at when and where Berkshire resident pedal cycle user casualties were involved in collisions, the analysis now explores how these collisions occurred.

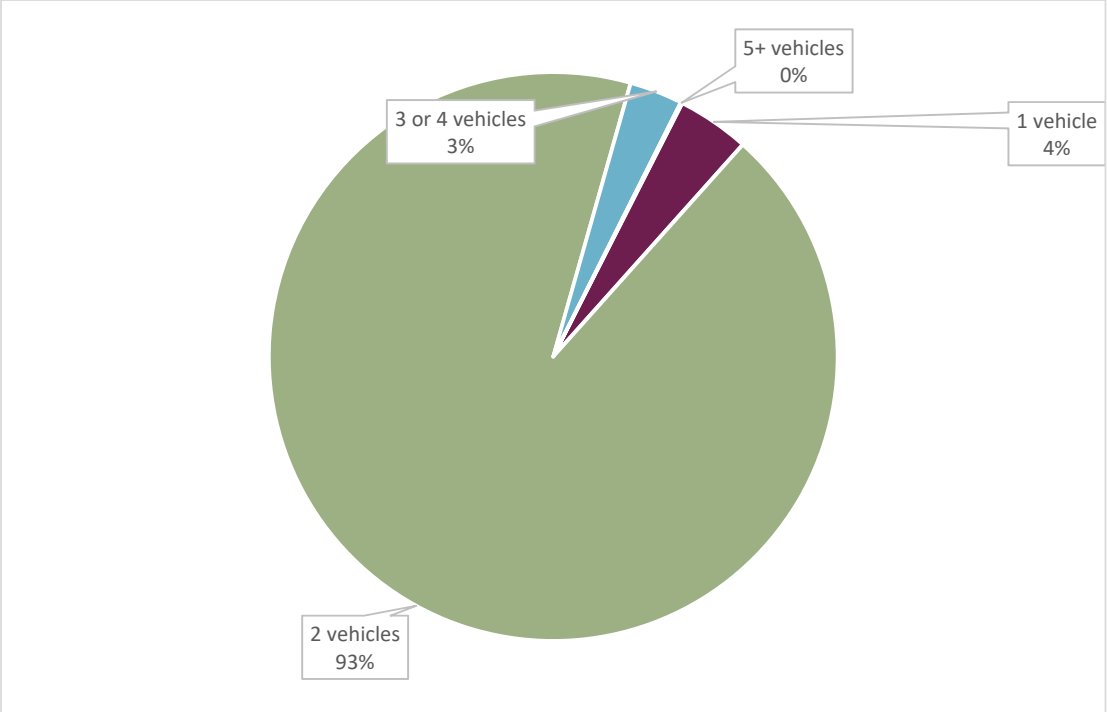
In order to understand the circumstances surrounding how Berkshire residents were injured in collisions as pedal cycle user casualties, it is important to look at the other vehicles involved. Table 11 shows the number of pedal cyclists and whether or not at least one of the other types of vehicle was involved. As one cyclist can be involved in a collision with multiple different parties and some of the categories are not mutually exclusive (such as a car driver also being a senior driver), the percentages do not add up to 100%. It should also be remembered that the cyclists themselves could be the senior or young drivers in the bottom two rows which are in italics.

TABLE 11 - NUMBER OF CYCLISTS BY OTHER VEHICLES INVOLVED (NOT EQUAL TO 100% AS MULTIPLE PARTIES CAN BE INVOLVED IN ONE INCIDENT)

Crash Involved	Berkshire Residents		Berkshire Roads	
	Number	%	Number	%
Bus involved	9	0.8%	8	0.7%
Car involved	950	86.6%	976	87.8%
Motorcycle involved	9	0.8%	8	0.7%
HGV involved	17	1.6%	15	1.3%
Van involved	53	4.8%	51	4.6%
Senior driver involved	*75*	*6.9%*	*76*	*6.8%*
Young driver involved	*83*	*7.6%*	*86*	*7.7%*

The analysis shows that a high percentage of the Berkshire residents pedal cyclists were injured in crashes where a car was involved and also that a high percentage of senior drivers or riders were involved (which could be the cyclists themselves). Cycle casualties on Berkshire roads are slightly more likely to have been involved in a collision with a car and slightly less likely to have been with a collision with a motorcycle or bus.

FIGURE 7 – BERKSHIRE PEDAL CYCLE USER CASUALTIES BY THE NUMBER OF VEHICLES IN THE CRASH

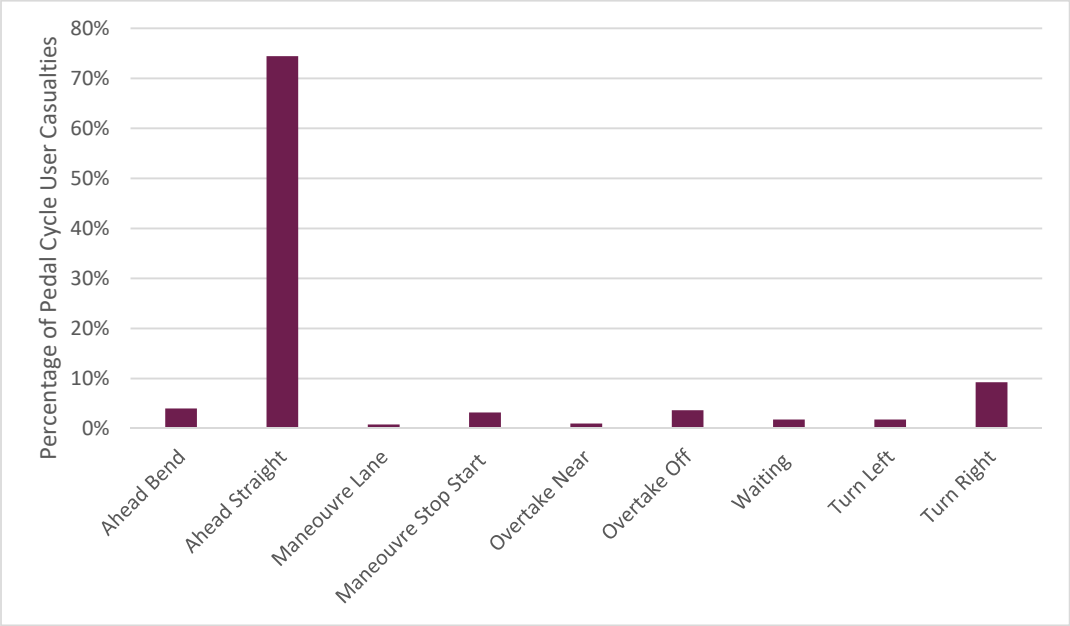


Most of the Berkshire pedal cycle user casualties were involved in a collision with one other vehicle (93%), with only 4% involved in single vehicle collisions. This is similar for cyclists injured on Berkshire's roads.

The term 'pedal cycle user casualties' includes riders and their passengers who were injured on a bicycle. Four of the 1,094 Berkshire resident pedal cycle user casualties were passengers. The same holds true for those injured on Berkshire's roads: 6 out of the 1112 pedal cycle user casualties were cycle passengers.

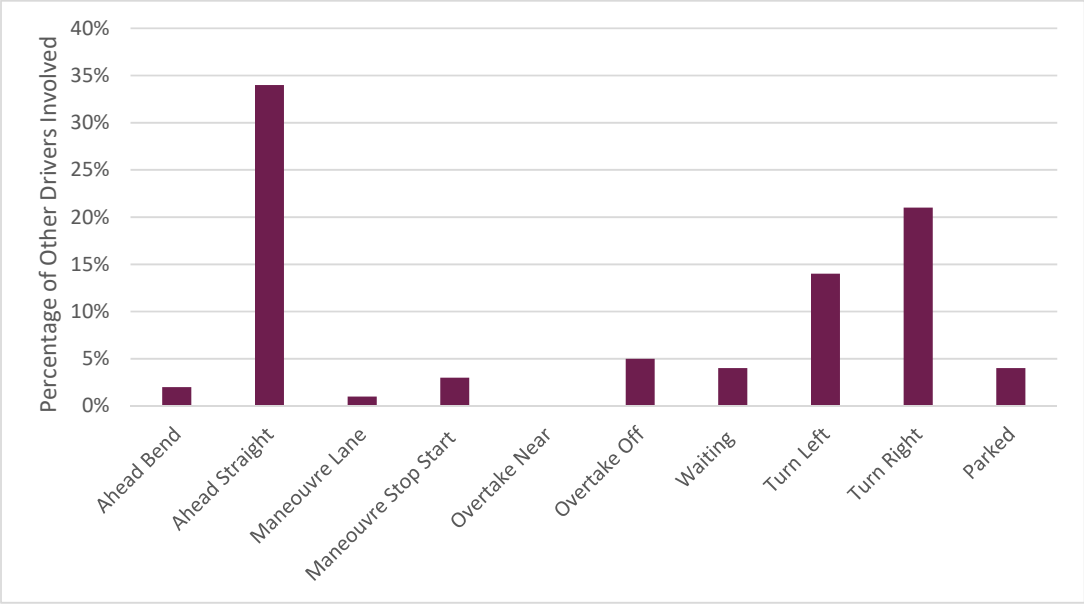
The junction analysis found that 27% of Berkshire pedal cyclists were not at junctions at the time of their collision and that it could be that other vehicles were exiting junctions into their path. Analysis of the manoeuvres of Berkshire resident pedal cyclists found that 74% were travelling straight ahead. There were slightly more cyclists on Berkshire's roads travelling straight ahead (75%).

FIGURE 8 – MANOEUVRES OF BERKSHIRE PEDAL CYCLISTS



The manoeuvres of the related vehicles can also be analysed. As cars, taxis and vans account for 86% of the other vehicles involved in crashes with Berkshire resident pedal cycle user casualties, these have been focused on in the analysis. Their manoeuvres are shown in Figure 9. It shows that a third of the cars and taxis were travelling straight ahead at the time of the collision and a further 21% were turning right. Another 14% of these vehicles were turning left. The turning actions reflect the junction issues highlighted earlier.

FIGURE 9 – PERCENTAGE OF RELATED VEHICLES BY MANOEUVRE (CARS AND TAXIS ONLY)



It is possible to analyse the contributory factors (CFs) recorded by a police officer when completing the collision records. The following analysis only looks at collisions investigated at the scene by an officer and even then, it needs to be remembered that these factors reflect the officer's opinion at the time of reporting and might not be the result of extensive investigation. Analysis has been undertaken on the collision-involved pedal cyclists from Berkshire (who were injured) by the CFs assigned to them and also by the CFs assigned to the other involved drivers (using data from MAST Professional).

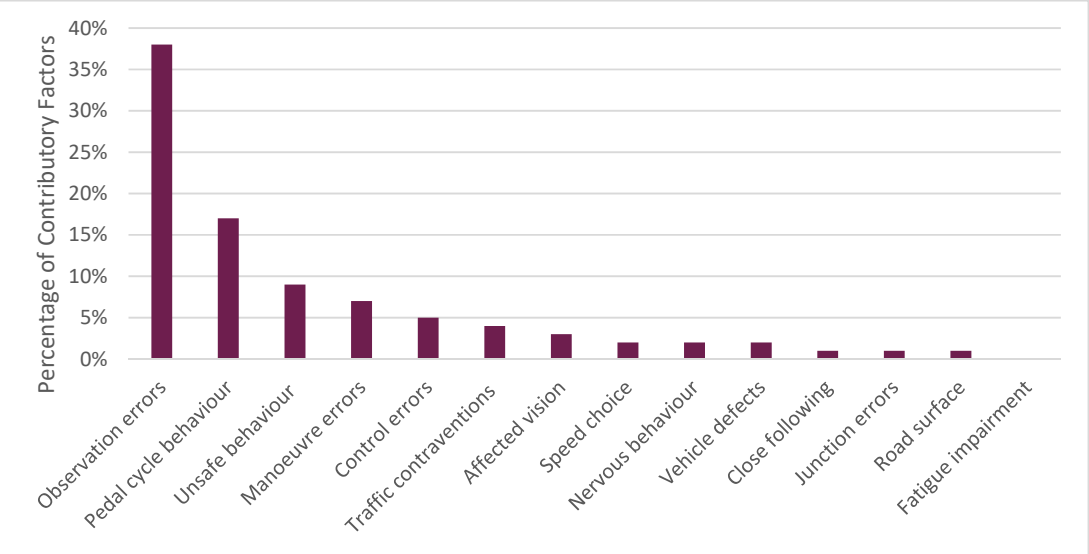
Table 12 shows the proportions of injured pedal cyclists and drivers of any vehicle from Berkshire who were assigned any contributory factor. It shows that generally, about three-fifths of drivers are thought to have contributed to their collision in some way and were assigned at least one contributory factor. Pedal cyclists were less likely than all vehicles to receive a contributory factor and this also applies Berkshire residents.

TABLE 12 – PROPORTION OF PEDAL CYCLISTS (INJURED RIDERS) ASSIGNED ANY CF

	All Vehicles	Pedal Cyclists
Berkshire – Assigned Any CF	60%	55%
Berkshire roads – Assigned Any CF	61%	56%

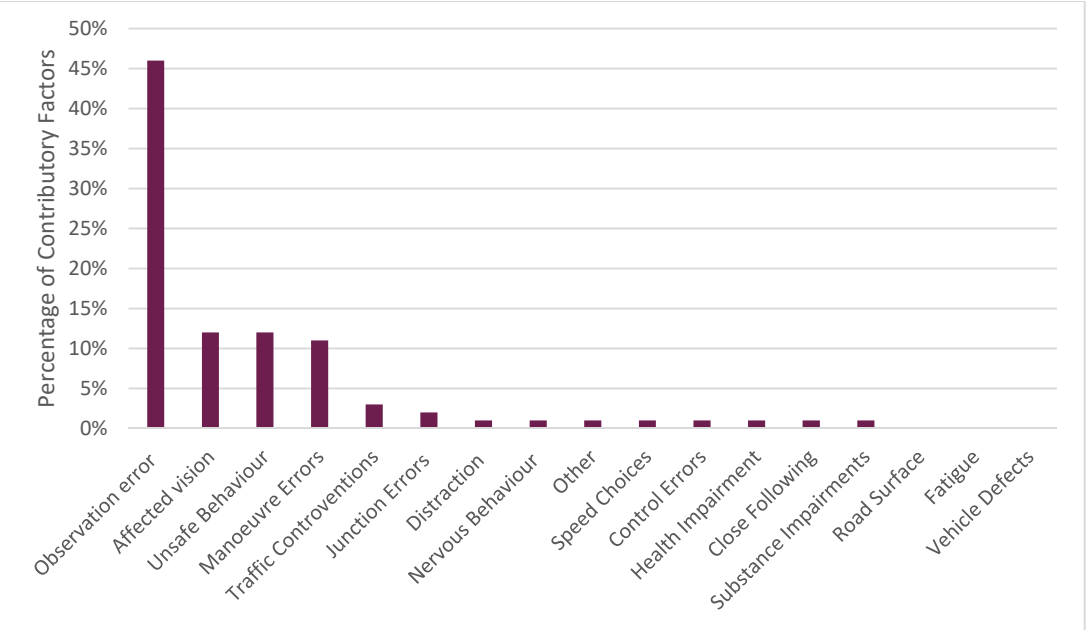
Figure 10 shows the contributory factors assigned to injured Berkshire pedal cyclists as a percentage of all injured Berkshire pedal cyclists (in collisions attended by a police officer). It should be noted that participants in collisions can be assigned more than one CF so the percentages of cyclists will add up to more than the total cyclists receiving at least one CF. Individual CFs have been grouped together and the categories are shown in Appendix B – Contributory Factor Groupings. The analysis shows that the highest percentage (38%) of Berkshire pedal cyclists receive 'Observation Errors'. 'Observation Errors' include 'Failed to look properly' and 'Failed to judge other person's path or speed', with 'pedal cycle behaviour', which includes travelling along the pavement or entering the road from the pavement, were assigned to 17% of Berkshire's pedal cyclists.

FIGURE 10 – BERKSHIRE PEDAL CYCLISTS ATTRIBUTED CFS



There were some slight differences in the CFs assigned to pedal cyclists involved in collisions on Berkshire's roads. Observation errors were assigned to 35% of the riders (compared to 38% for Berkshire residents). 'Pedal cycle behaviour' were assigned to 19% of the riders who were involved in a collision on Berkshire's roads in comparison to 17% of Berkshire residents.

FIGURE 11 – CONTRIBUTORY FACTORS ASSIGNED TO OTHER DRIVERS IN COLLISIONS WITH BERKSHIRE RESIDENT PEDAL CYCLISTS



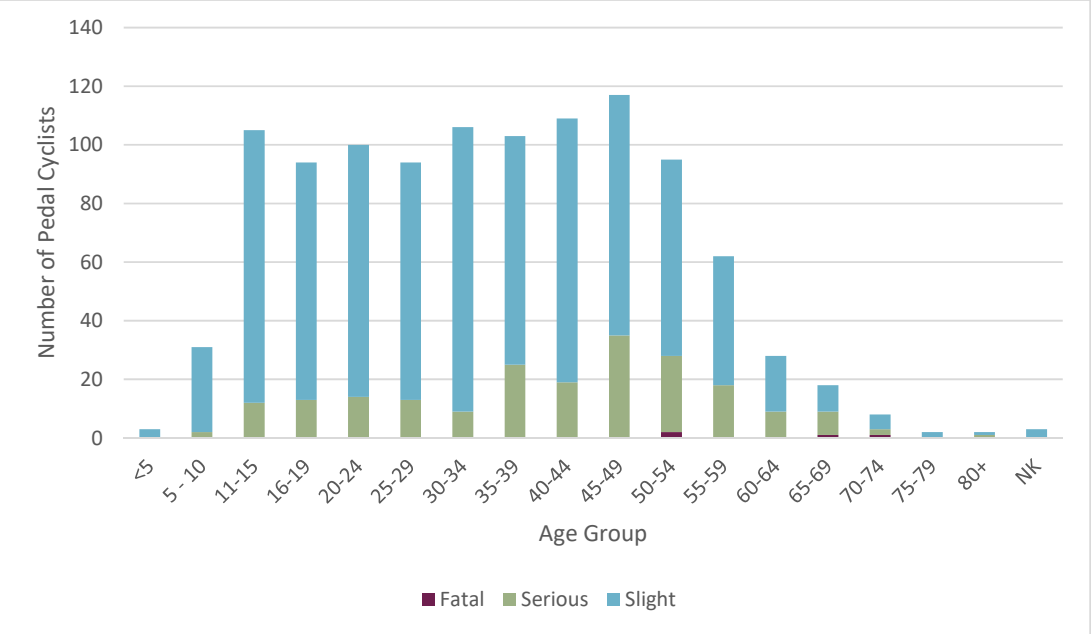
There were some slight differences in the CFs assigned to pedal cyclists involved in collisions on Berkshire's roads. Observation errors were assigned to 35% of the riders (compared to 38% for Berkshire residents). 'Pedal cycle behaviour' were assigned to 19% of the riders who were involved in a collision on Berkshire's roads in comparison to 17% of Berkshire residents.

Figure 11 shows the contributory factors assigned to other vehicles involved in collisions with Berkshire resident pedal cyclists. The most commonly assigned CFs are 'Observation Errors', including 'Failed to Look Properly' (34% of all vehicles) and 'Failed to Judge other Person's Path or Speed' (12%). A further 12% of the other vehicles were assigned 'Affected Vision' (specifically 'Dazzling Sun' and 'by Stationary or Parked Vehicle(s)'). 'Unsafe behaviour' also accounted for 12% of assigned CFs. The contributory factor percentages add up to 100%, as individual CFs are counted and not the number of other involved vehicles.

PEDAL CYCLE USER CASUALTIES PROFILES

Moving away from the 'when, where and how' questions, we can now explore the 'who' question. It is essential to understand more about the people involved in the collisions, including information about their everyday lives, as well as demographics.

FIGURE 12 - AGE OF PEDAL CYCLE USER CASUALTIES FROM BERKSHIRE



The ages of resident pedal cyclists, by severity, are shown in Figure 12. It shows that the single largest group of pedal cyclists are aged 45 to 49 years old, which accounts for 11% of all cyclists.

The overwhelming majority of pedal cyclists from Berkshire who were involved in collisions were male (82%).

Only 33% of the Berkshire resident pedal cyclists had a journey purpose recorded that was not 'other'. 'Other' can include leisure riding or where journey purpose is not known. Overall, 17% of the cyclist casualties were recorded as commuting, and 9% as 'at work'.

Distance from home can be calculated in kilometres using the distance between crash location and home postcode for each pedal cycle user casualties, averaged across the whole group of cyclists. The calculation does not plot along routes but is instead an 'as the crow flies' distance. Berkshire resident pedal cycle user casualties were, on average, 7km from home at the time of their collision. This supports the maps and the crash location analysis which shows that Berkshire resident pedal cycle user casualties are involved in collisions relatively close to home.

The home locations of resident Berkshire pedal cycle user casualties have been analysed. These are shown in the following map (Figure 13).

Higher percentages of pedal cycle user casualties live in wards across Slough, to the north of Windsor and Maidenhead, central Wokingham and central Bracknell Forest, and wards around Newbury.

FIGURE 13 - HOME LOCATION OF BERKSHIRE RESIDENT PEDAL CYCLE USER CASUALTIES (WARDS)

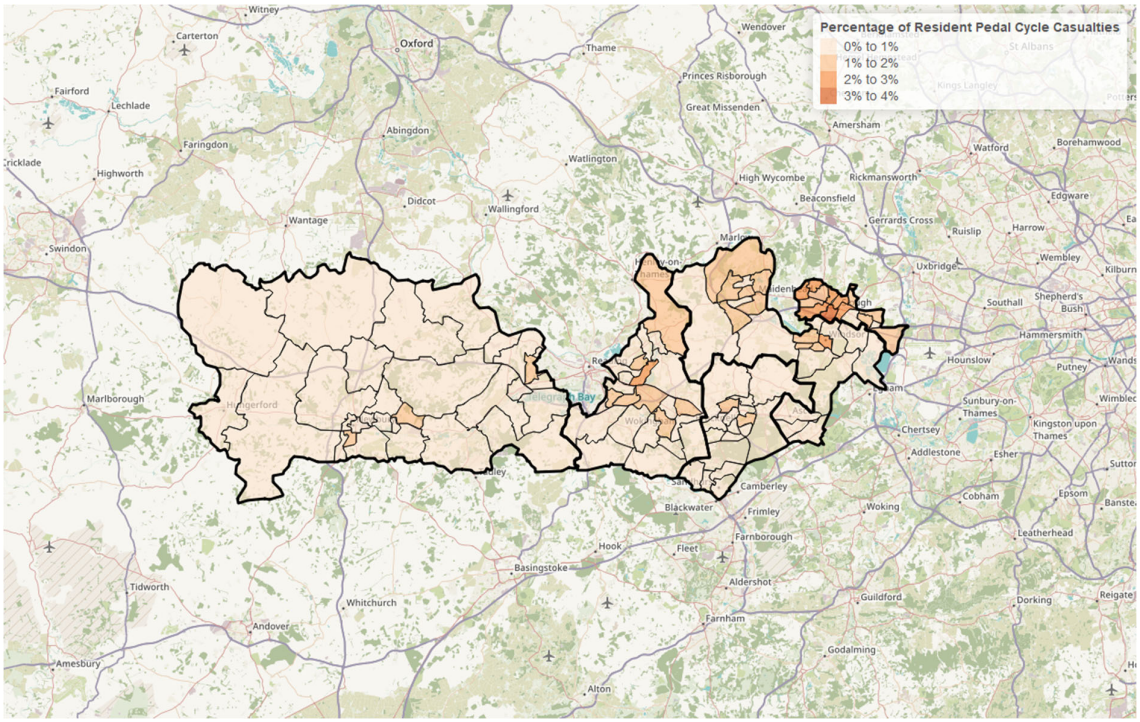
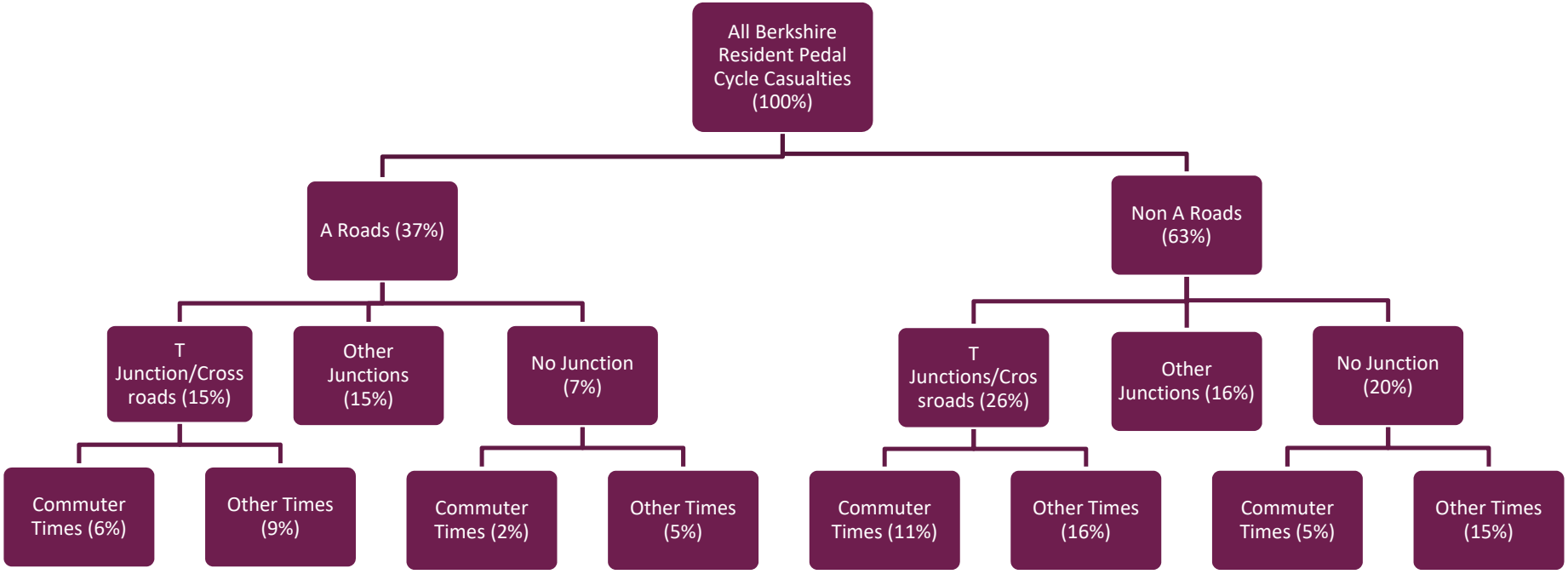


Figure 19 shows a summary of some of the collision characteristics of Berkshire resident pedal cycle user casualties. It shows that 11% were involved in collisions on non-A roads, at T-junctions or crossroads at the commuter times of 7-9am or 5-7pm on weekdays. A further 15% were injured on the same roads at the same types of junction at non-commuter times. Another 15% were involved in collisions at non-commuter times on non-A roads where there was no junction.

FIGURE 14 - CHARACTERISTICS OF BERKSHIRE PEDAL CYCLE USER COLLISIONS



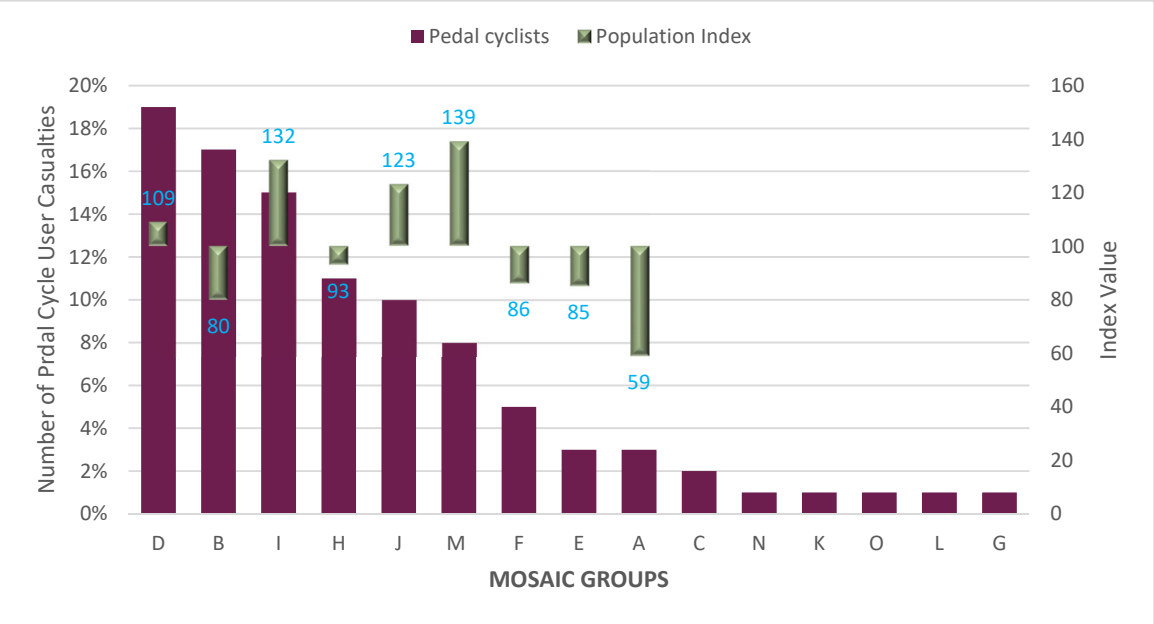
Commuter times are 7-9am and 5-7pm on weekdays

MOSAIC ANALYSIS

As well as demographic and spatial analysis of pedal cycle user casualties, we can also undertake socio-demographic analysis using Mosaic. Mosaic is intended to provide an accurate and comprehensive view of citizens and their needs by describing them in terms of demographics, lifestyle, culture and behaviour. By matching postcodes, we can segment cyclists into one of 15 *groups* and analyse their relative representation in the statistics based on population figures.

Figure 15 shows Berkshire resident pedal cycle user casualties, grouped by Mosaic Groups of the community in which they live.

FIGURE 15 – PEDAL CYCLE USER CASUALTIES FROM BERKSHIRE, GROUPED BY MOSAIC GROUPS (2013-2017)



Appendix A – Mosaic SuperGroup Composition on page 46 shows the composition of the Groups. The classification is based on the individual postcodes provided in STATS 19 records for each rider and uses the Experian Mosaic socio-demographic classification system (for details see **http://publicsector.experian.co.uk/Products/Mosaic Public Sector.aspx**). Typically, 85% of postcodes can be matched to a Mosaic Type, so this analysis is based on about five out of six of all Berkshire resident pedal cyclists. The purple bars indicate the number of pedal cycle user casualties in each Mosaic Group, with figures corresponding to the left-hand vertical axis. The green bars show the "Index" for each Mosaic Group. An Index value of 100 indicates that the number of cyclists is in proportion to the population of Berkshire's communities where that Group predominates. A value of 200 would mean that this Group is involved in collisions at twice the expected rate; a value of 50 would imply half the expected rate. Displaying the data overlaid on a single chart allows quick and easy analysis of total pedal cyclists and relative risk. The Index value becomes less significant as the number of pedal cyclists decreases and random change lowers confidence levels.

When carrying out Mosaic analysis the approach is to look for both levels of high representation and high index scores in individual Mosaic Groups, and this is the case with Group I for pedal cyclists. Group B (*Prestige Positions*) is under represented compared to the local population and but represents a

large number of cyclists. Group D (*Domestic Success*) is slightly over represented compared to the local population and represents the largest number of cyclists.

Urban Cohesion (Mosaic Group I) and *Family Basics* (Mosaic Group M) are over-represented against the Berkshire population, however, consist of lower number of pedal cycle user casualties.

TABLE 13 - CHARACTERISTICS OF LARGEST MOSAIC GROUPS AMONGST PEDAL CYCLE USER CASUALTIES

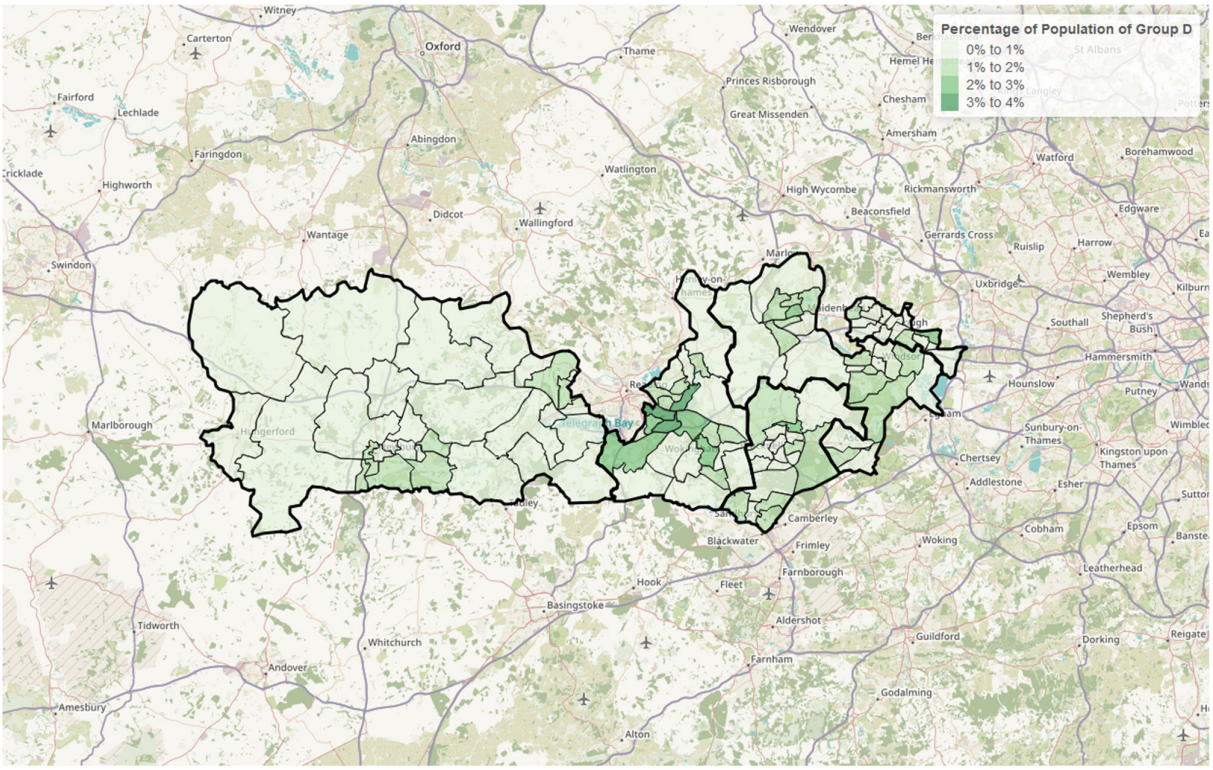
Mosaic Groups				
	Group B – Prestige Positions	Group D – Domestic Success	Group I – Urban Cohesion	Group M – Family Basics
Multicultural	×	×	✓	✓
45-49 years old	✓	✓	×	✓
Children 11-15	✓	×	✓	✓
Own bicycle	✓	✓	×	-
Car ownership	✓	✓	×	×
Exercise 4+ hours a week	✓	✓	×	×
Low Income	×	×	✓	✓
Degree or higher	✓	✓	×	×
Employed Full-time/other	×	✓	-	-
Student/Unemployed	×	×	✓	✓
Part-time/Housewife	✓	✓	×	×
Retired	✓	×	-	-
Works in: Information and Communication	✓	✓	✓	×
Works in: Professional, Scientific and Technical	✓	✓	×	×
Confidence in Police	✓	✓	✓	×
Use internet every day	✓	✓	×	✓
Ethnicity	White, Indian	White	Pakistani Bangladeshi Indian Other Ethnic Group Chinese Black/African/Caribbean Traveller	Traveller Mixed Ethnic Groups Black/African/Caribbean Traveller
Communication Preferences (of adults within the home)				
Mobile call	×	×	✓	✓
SMS	×	✓	✓	✓
Email	✓	✓	×	✓
Post	✓	×	✓	-
Landline	×	×	✓	✓
Prefer not to be contacted	×	×	×	×
Like new technology	×	✓	✓	✓
Use Facebook weekly	✓	✓	✓	✓
Use Twitter weekly	×	✓	✓	✓

Table 13 summarises some of the main characteristics of the Mosaic Groups the Berkshire resident pedal cyclists fall under. The table shows which characteristics the Groups have, indicated by a tick where the characteristic is over-represented. It shows that there are some variations amongst the four Groups.

In addition to being over-represented, Group D share more characteristics with those identified in the casualty analysis. Residents in Group D communities are over-represented in the same age group as Berkshire resident casualties. Whilst they do own a car, they are also over-represented as owning a pedal cycle. They exercise often and are therefore possibly choosing to cycle for fitness reasons, rather than commuting. Their households consist of 45-49 year olds but do not have 11-15 year old children. They are most likely to be full-time or part-time employed, hence a peak in the morning rush hour. Group M residents are over-represented as working in information and communication; financial and insurance; professional, scientific and technical; and public administration and defence. In terms of communication preference, Group D prefer email. They are fans of new technology and use facebook and Twitter daily.

The Mosaic profiling suggests that there are some differences between pedal cycle user casualties from Berkshire, but there are also a number of similarities which can help create a cohesive intervention plan for perhaps two different types: leisure and health cyclists and deprived commuter cyclists. The STATS19 and Mosaic analysis are used to create 'personas' later in this document to provide a complete insight into the types of pedal cyclists from Berkshire involved in collisions.

FIGURE 16 – AREAS OF RESIDENCE FOR MOSAIC GROUP D IN BERKSHIRE



The above map (Figure 16) shows the Lower layer Super Output Areas (LSOAs) within Berkshire where Group D is the dominant Group. For further information about super output areas, refer to

http://neighbourhood.statistics.gov.uk/dissemination/. It shows concentrations in Wokingham; the east of Windsor and Maidenhead and around Maidenhead itself; across Bracknell Forest; and around Newbury.

Figure 17 shows the LSOAs within Berkshire where Group I is the dominant group. It shows that this group is overwhelmingly dominant in Slough.

FIGURE 17 – AREAS OF RESIDENCE FOR MOSAIC GROUP I IN BERKSHIRE

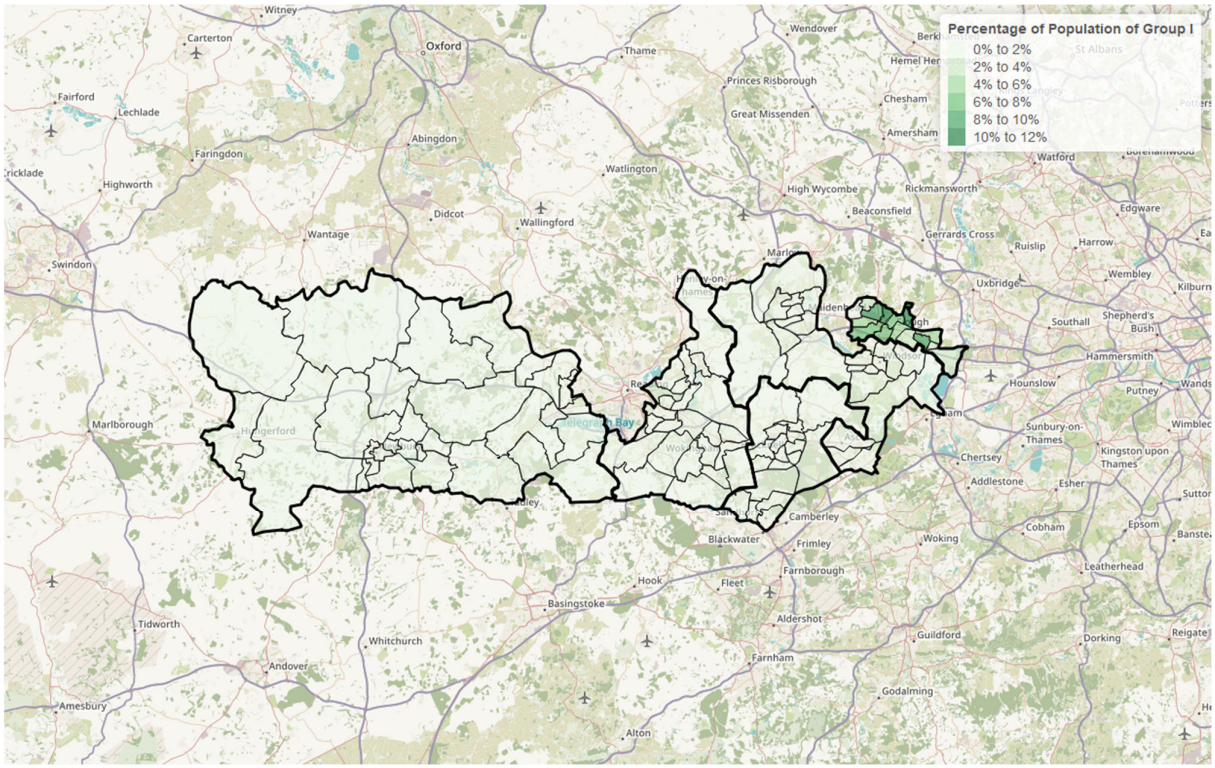


Table 14 provides a summary of some main characteristics of these over-represented groups (Group I; Group M; Group B; Group D) and these can be used to create a picture of the target audience in terms of economic and educational position; and family life. This information is invaluable for understanding target audiences and knowing how to communicate with them.

TABLE 14 - SUMMARY OF CHARACTERISTICS OF OVER-REPRESENTED MOSAIC GROUPS[8]

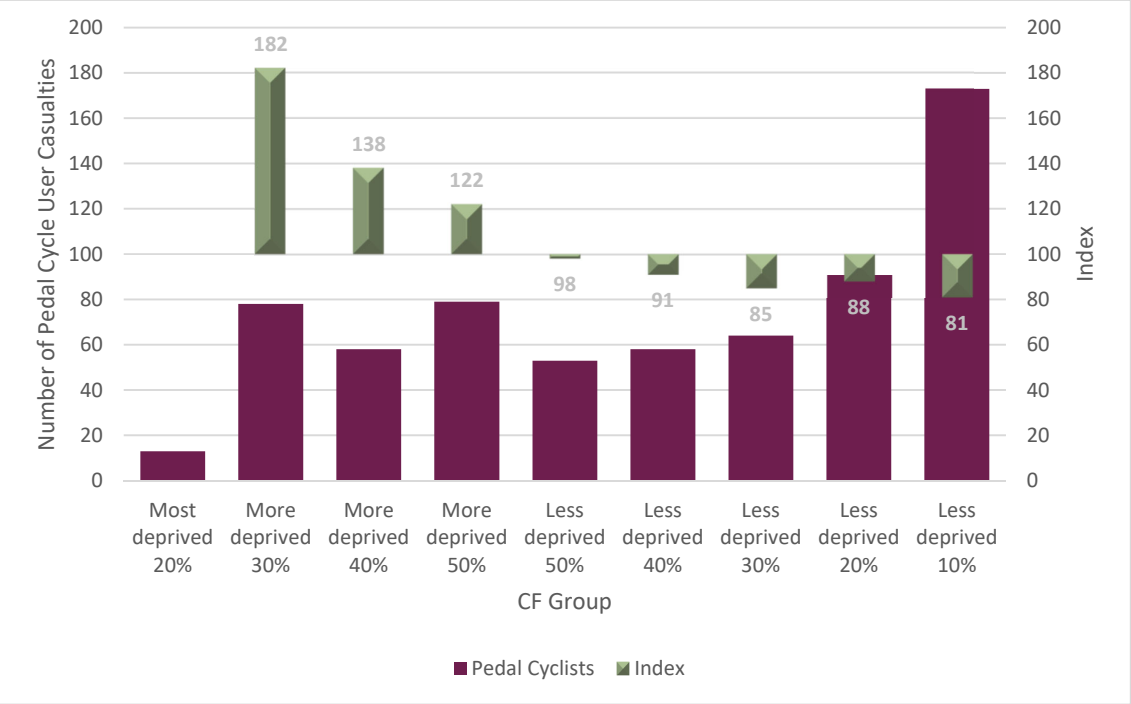
Group I	Group M
Urban Cohesion	Family Basics
Urban Cohesion contains both families with school age and older children, and older people pre and post retirement. A good proportion are larger families who share their home with elderly parents or other family members. They live in accessible suburbs close to the centres of larger towns and cities. These are diverse neighbourhoods and a significant proportion of the population is of South Asian origin. Typical homes are Victorian terraced houses or pleasant semi-detached and terraced houses built between the wars. A minority live in more modern purpose-built flats. Often Urban Cohesion's homes are relatively expensive because of their central locations and proximity to London. The majority of people are homeowners, many without the need for a mortgage. Household incomes overall are moderate, derived from work in lower managerial, intermediate and semi-routine occupations. Many are technology fans and they like to have up-to-date gadgets and phones. They often use them extensively and have the second highest mobile phone bills of any group. Mobile and SMS are their communications preferences for most marketing contacts with organisations. However, they are more cautious about purchasing online.	Family Basics are families with children who have limited budgets and can struggle to make ends meet. Their homes are low cost and are often found in areas with fewer employment options. Typically aged in their 30s and 40s, Family Basics consists of families with school age children, whose finances can be overstretched due to limited opportunities, low incomes and the costs of raising their children. In addition to younger children, some families also continue to support their adult offspring. Homes are typically low value and may be located on estates or in pockets of low-cost housing in the suburbs of large cities and towns. They are usually three bedroom terraced or semi-detached houses, often dating from between the wars or from the 1950s and 1960s. Most people have lived in the area for many years. Limited qualifications mean that people can struggle to compete in the jobs market, and rates of unemployment are above average. Employment is often in low wage routine and semi-routine jobs. As a result, many families have the support of tax credits, but significant levels of financial stress still exist. Poor health is more common here than amongst the general population, with people more likely to smoke and less likely to follow a healthy diet, exercise or play sport to keep in shape. Parents in this group do enjoy a drink but do so less often than many others. With other priorities to focus on, this group is one of the least likely to recycle or re-use items or particularly try to save energy or water. Their level of environmental knowledge is also lower than most. SMS and mobile calls are their communication preferences for most marketing contacts with organisations.

Group B Prestige Position	Group D Domestic Success
Prestige Positions are affluent married couples whose successful careers have afforded them financial security and a spacious home in a prestigious and established residential area. While some are mature empty-nesters or elderly retired couples, others are still supporting their teenage or older children. Prestige Positions live in large family homes even though some of them no longer have children living at home. These are expensive detached properties, frequently with five bedrooms and large mature gardens in easily commutable locations. Of those whose children have grown up many are still offering support, either with a place to live in the family home, or by supporting them through university. For this group the continued financial support of their children is not a problem. With busy lives to manage many make good practical use of the internet without spending long hours online. In particular they manage bank accounts online, search for savings accounts with the best interest rates, and save time by shopping online. They are more active than many younger groups and more inclined than the average to eat 'Five a day', these professional people are in good health. They have good levels of environmental knowledge and are more dedicated than most when it comes to recycling in particular. Email and post are their communication preferences for most marketing contacts with organisations.	Domestic Success are high-earning families who live affluent lifestyles in upmarket homes situated in sought after residential neighbourhoods. Their busy lives revolve around their children and successful careers in higher managerial and professional roles. Families in Domestic Success are headed by couples typically aged in their late 30s and 40s, many of whom have school age children. Parents in this group are the most likely to have a degree and may have delayed having children until their careers were established. Company car ownership is high, a benefit of working for well-known organisations or professional firms in sectors such as finance, property, information technology and professional services. Domestic Success is a healthy group and is one of the more active when it comes to taking part in sport and keeping in shape. However, with busy, demanding jobs and many also juggling children and work these families are not always quite as healthy or active as they could be. While far fewer than average smoke, and more than average manage to follow healthy eating guidelines, Domestic Success do drink fairly regularly though rarely every day. They are a little more knowledgeable than people in general around key environmental issues and are more likely to adopt green behaviours at home. However, they are generally better at recycling and re-using than they are at making efforts to reduce their energy consumption. Their communication preference is by email for most marketing contacts with organisations.

INDEX OF MULTIPLE DEPRIVATION (IMD)

As well as looking at the Mosaic socio-demographic classifications, it also possible to look at relative wealth using the UK IMD values for each postcode. IMD uses a range of economic, social and housing data to create a single deprivation score for each small area of the country. The analysis (Figure 18) uses deciles, which creates ten groups of equal frequency, ranging from the 10% most deprived areas to the 10% least deprived areas.

FIGURE 18 – IMD OF PEDAL CYCLE USER CASUALTIES FROM BERKSHIRE



The largest number of Berkshire pedal cycle user casualties live in the least deprived 10% communities, however they are under-represented. There is an over-representation from the most deprived 30% communities in Berkshire. It should be remembered that the indices of multiple deprivation include income; employment; health; education; crime; access to services; and living environment and are not merely about relative wealth.

HEALTH PERSPECTIVE

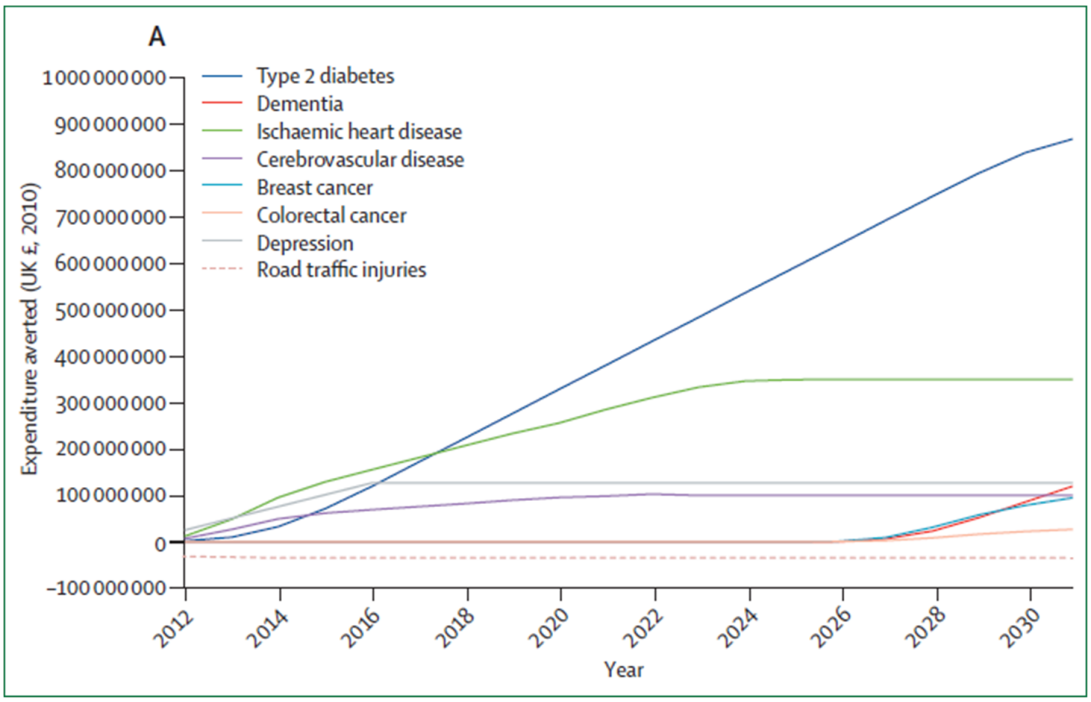
In addition to understanding the circumstances surrounding collisions involving pedal cycle user casualties from Berkshire and identifying target audiences, it is necessary to look at cycling from a health perspective. Treatment of casualties injured in road traffic collisions represent a large burden to local health services, ranging from emergency care with ambulances and A&E care; to treatment in a range of clinics and surgery units; as well as recuperative care on hospital wards. There are obvious benefits to health services of reductions in the number of people injured on local roads and of reductions in the number of local people injured anywhere but requiring long term care in their area of residence.

Alongside the benefits to the health sector of reducing road casualties, there are also significant gains to be made from encouraging residents to start cycling. Travel behaviour and health indicator data have shown that countries with the highest levels of cycling and walking have the lowest obesity rates. Active travel modes are effective because they allow individuals to incorporate *"moderate intensity activities into their daily routines. This has been shown to be more sustainable over time than structured activity programs (e.g. running or going to the gym), yet has similar health benefits."*[9]

There are extensive local health benefits to be gained from encouraging sustainable travel amongst local residents.

Regular exercise protects against heart disease and, by limiting obesity, reduces the onset of diabetes. It promotes a sense of well-being and protects older people from depression. Reducing road traffic would also reduce the toll of road deaths and serious accidents…. In contrast to cars, which insulate people from each other, cycling, walking and public transport stimulate social interaction on the streets…. Social isolation and lack of community interaction are strongly associated with poorer health. Reduced road traffic decreases harmful pollution from exhausts. Walking and cycling make minimal use of non-renewable fuels and do not lead to global warming. They do not create disease from air pollution, make little noise and are preferable for the ecologically compact cities of the future.[10]

FIGURE 19 – NHS EXPENDITURE AVERTED FROM INCREASING ACTIVE TRAVEL[11]



A modelling study estimated the effects of long-term and yearly changes in NHS treatment costs that could be averted by increasing walking and cycling in urban areas in England and Wales. By shifting to current levels undertaken in Copenhagen (walking 0.6km/day to 1.6km/day and cycling increasing from 0.4km/day to 3.4km/day), the model estimates that roughly £17 billion (in 2010 prices) could be released from the NHS budget after 20 years.

> *Most of these released funds are because of a decrease in the expected number of cases of type 2 diabetes, leading to a saving of roughly £9 billion in 20 years. The increase in road traffic injuries is projected to cost about £722 million during the period; however, the spending averted through reduction of the burden of type 2 diabetes only greatly outweigh these costs.*[12]

Table 15 shows the relevant public health outcomes which relate to cycling. Improving health through increasing physical activity and reducing air pollution and social isolation as well as through reducing road traffic collisions will have a significant effect on the indicators against which public health is measured.

TABLE 15 – RELEVANT PUBLIC HEALTH OUTCOMES FOR CYCLING WITH SCORES FOR BERKSHIRE[13]

Domain	Indicator	Relevance	ENGLAND	Bracknell Forest	Slough	West Berkshire	Windsor and Maidenhead	Wokingham
Domain 1: Improving the Wider Determinants of Health	1.10: Killed and seriously injured casualties on England's roads (2015-17)	Injury	**40.8**	**27.3**	**30.9**	**36.2**	**38.3**	**27.8**
	1.14i: The rate of complaints about noise (2015/16)	Noise and air pollution	**6.3**	**4.4**	**2.9**	**3.8**	**3.6**	**4.2**
Domain 2: Health Improvement	2.06i: Excess Weight in 4-5-year old's (2017/18)	Physical Activity	**22.4**	**33.1**	**22.3**	**20.4**	**17.1**	**16.2**
	2.06ii: Excess Weight in 10-11-year old's (2017/18)		**34.3**	**33.1**	**41.0**	**28.7**	**30.8**	**26.1**
	2.12: Excess weight in adults (2016/17)		**61.3**	**61.9**	**61.9**	**62.7**	**57.9**	**55.0**
	2.13i: Proportion of physically active adults (2016/17)		**22.2**	**14.9**	**33.3**	**16.3**	**16.7**	**17.3**
	2.17: Estimated diabetes diagnosis rate (2018)		**78.0**	**81.3**	**88.4**	**67.3**	**66.1**	**67.7**
	2.24i: Estimated hospital admissions due to falls in people aged 65 and over (2017/18)		**2170**	**2513**	**2378**	**2108**	**2408**	**2161**
	2.07i: Hospital admissions caused by unintentional and deliberate injuries in children and young people aged 0-14 years (2017/18)	Injury	**96.4**	**82.4**	**97.7**	**63.8**	**90.5**	**68.8**

	2.07ii: Hospital admissions caused by unintentional and deliberate injuries in children and young people aged 15-24 years (2017/18)		132.7	170.6	164.1	144.5	148.7	133.1
Domain 3: Health Protection	3.01: Fraction of mortality attributable to particulate air pollution (2017)	Noise and air pollution	5.1	5.6	6.4	5.2	5.8	5.7
Domain 4: Healthcare public health and preventing premature mortality	4.05i: Under 75 mortality rate from cancer	Physical Activity	134.6	123.6	138.6	120.0	113.9	113.2
	4.01: Infant mortality (2015-17)	Physical Activity/Injury	3.9	2.8	5.3	4.2	3.6	3.5
	4.03: Mortality rate from causes considered preventable (2015-17)	Physical Activity/Injury/Social Contact/ Noise and air pollution	181.5	150.1	218.7	150.6	140.8	127.7
	4.04i: Under 75 mortality rate from cardiovascular diseases (including heart disease and stroke) (2015-17)	Physical Activity/ Noise and air pollution	72.5	55.6	111.3	49.4	52.6	46.3
	4.07i: Mortality from respiratory diseases (2015-17)	Noise and air pollution	34.3	28.4	44.7	24.7	21.2	19.6

Key: Green indicates better than benchmark, orange indicates similar performance, red indicates worse. Blue indicates lower rates whilst clear are indicators which are not compared.

One of the barriers to encouraging more people to cycle is the perception that it is a dangerous activity.

However everyday cycling, like walking, is a low-risk activity and one where the health benefits outweigh the risk of injury by 20:1 or more. People who cycle regularly live longer, on average, than people who do not, with healthier lives and less illness. Evidence shows that cycling in Britain is safer than driving in

many other countries, including France and Belgium; cycling is far safer than driving anywhere when the health benefits and reduced risk to third parties are included.[14]

Evidence suggests that if the promotion of cycling and walking are accompanied by suitable planning and safety measures "*active commuters are likely to benefit from a 'safety in numbers' effect: with increasing levels of active travel, walking and cycling become safer*."[15] To expand on this, collision risk for cyclists and pedestrians per distance travelled are, on average, considerably higher than for vehicle occupants. Comparisons across Europe have found that instead of increasing road crashes by increasing the levels of cycling and walking, "*increased active transport appears to be linked to reduced road crash deaths, implying that increasing presence of walkers and cyclists improves the awareness of motor vehicle drivers and/or that policies to separate motorized from non-motorized transport are effective*."[16]The Netherlands, with a good cycling infrastructure, has around 30% of trips by bicycle, with a fatality risk of 1.1 per 100 million km cycled. This is in comparison to the UK and the US with 3.6 and 5.8 fatalities per 100 million km cycled respectively and 1% of trips are by bike.[17]This is a complicated issue, however – the investment in safer infrastructure in countries like The Netherlands could reduce the risk of those already cycling as well as encourage more people to cycle and that it is the specific infrastructure, rather than the quantity of cyclists that reduces the risk.

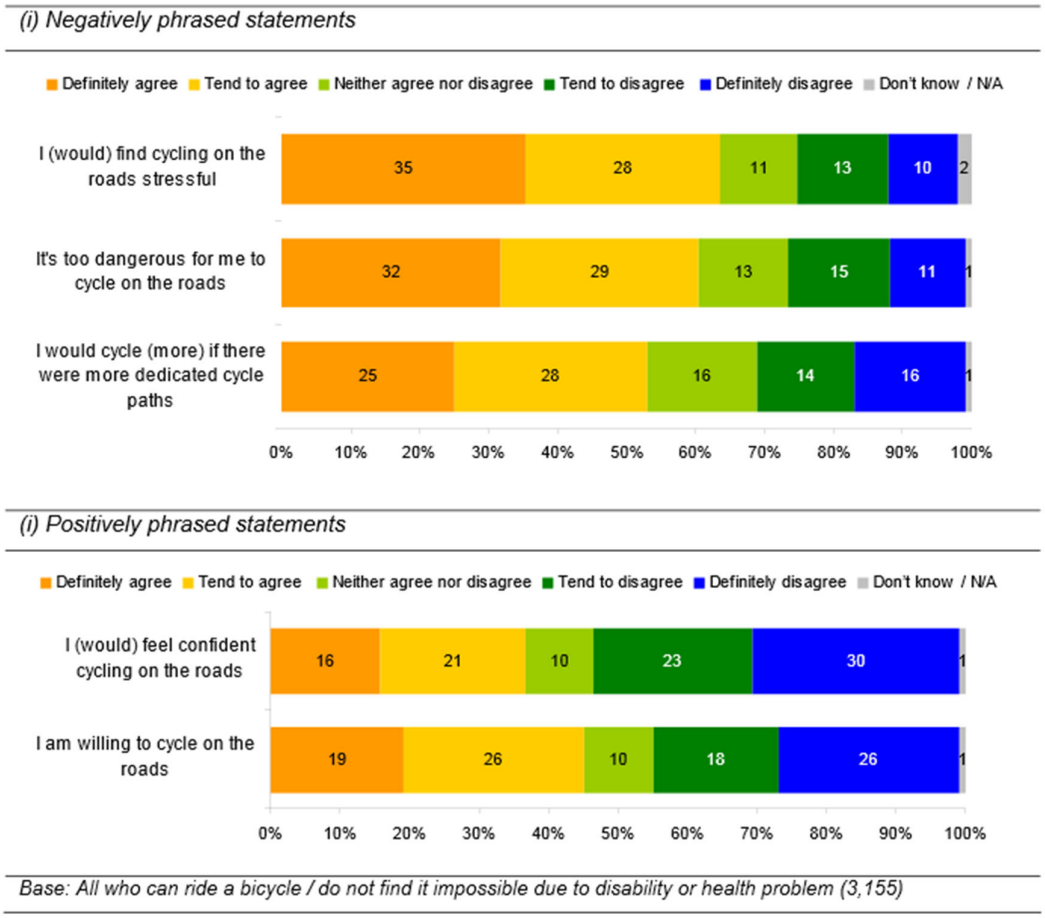
One of the problems with the Safety In Numbers (SIN) argument is that the numbers in question have to be quite large. Even a doubling of cyclists on the roads would have little impact on casualty rates. Preliminary analysis from RSA suggests that where cycling rates are eight times the national average, casualty rates halve. This does of course still mean four times more injured cyclists than the national norm.

Despite the strong evidence showing that the benefits outweigh the risks of cycling and that it could be that the more people cycle, the safer it becomes[18] (because drivers are more aware of cyclists and anticipate their behaviour; that drivers are also more likely to be cyclists themselves; and more cycling leads to greater political will to improve conditions for cyclists[19]) people do not feel safe when cycling. A 2012 Sustrans survey found that 56% of respondents feared that urban roads were unsafe to cycle on[20]and in a large scale survey of public attitudes towards climate change, commissioned by the DfT, almost two-thirds of respondents who were able to cycle agreed with the statement "it's too dangerous for me to cycle on the roads."[21] Figure 20 shows the responses to various statements about cycling, indicating that amongst those who were able to cycle, confidence about cycling on the roads was low.

These findings present a challenge to policy makers as explaining that the benefits of cycling outweigh the risks might not be enough to allay fears. It is sometimes suggested that the promotion of high visibility clothing and cycle helmets reinforces the perception that cycling is an unsafe activity. "*However, cycle helmets do significantly reduce the chance of a serious head injury in a crash. Many studies from around the world have shown that if a cyclist wears a helmet, the risks faced when cycling are a lot lower."*[22]Like Safety in Numbers, cycle helmets are a contentious topic. Studies have shown that cycle helmets would be expected to be most effective in collisions which do not involve another vehicle (such as falls from the cycle) or where a vehicle has a light impact with the cyclist who then hits their head on the ground (both of which are collisions regularly associated with children).[23] There are arguments that some people would be deterred from cycling if helmets were compulsory: firstly, that the use of protective clothing suggests that it is a dangerous activity and secondly, as discussed

later, some people find helmets inconvenient and unfashionable. All cycling safety messages should be promoted in a way to highlight the wider positive health benefits of cycling to encourage greater activity. Reducing or improving the types of interaction between cyclists and motorised vehicles (such as in The Netherlands) reduces the need to promote personal protective equipment.

FIGURE 20 – ATTITUDES TOWARDS CYCLING AND SAFETY (SOURCE: THORNTON, A., BUNT, K., DALZIEL, D. AND SIMON, A., *CLIMATE CHANGE AND TRANSPORT CHOICES)*



PERSONAS

Following the analysis of risk, it is necessary to combine the elements of casualty and collision profiling to create a persona or personas which capture the key characteristics of those communities or groups most at risk. Although a persona will not typify all, or perhaps even a majority of those involved in collisions, it should represent a significant proportion of those who are most vulnerable.

The analysis of the socio-demographic data as well as the collision information has allowed a picture to be built up about the kinds of pedal cyclists from Berkshire who are injured. More than one type of cyclist has emerged, both in terms of socio-demographic profiling and collision analysis. The findings allow key characteristics to be collated into personas. Parallels have been drawn from the multiple data sets in the creation of these personas to ensure alignment along clear data points.

There are **4** personas which have emerged from the analysis:

1. **'Howard'** – In his early 60s, owns a high value detached house in a Group B, predominately white neighbourhood. He is educated to a degree level and most likely retired having had a successful career in a managerial/senior position within the professional, scientific and technical sector. He owns a car as well as a bicycle which he most likely uses for leisure or exercise purposes. He is very active and exercises a minimum of four hours per week. He also has a child between the ages of 11-15, who may also cycle for leisurely/exercise purposes. Howard tends to be injured in collisions on main roads, specifically at junctions (crossroads and T-junctions). Howard is often travelling straight ahead at the time of his collision (often with a car) and this might suggest that cars are exiting junctions into his path. Alternatively, the cars could be following or passing too close. This could suggest that visibility is an issue. He could perhaps be persuaded to improve how visible he is to other motorists (through clothing and high visibility additions to his bicycle, including the use of good quality lights) and the other motorists could be targeted through an awareness campaign (as other motorists 'fail to look properly'). There could also be a skills deficit that might need to be addressed – Howard is often considered to have contributed to his collisions through observation errors (failed to look properly or failed to judge other's path or speed), control errors (which include sudden braking, swerving and loss of control); and through unsafe behaviour (aggressive driving and careless, reckless or in a hurry). All of these contributory factors suggest that some training could be beneficial. However, it should be remembered that only 55% of the cyclists were thought to have contributed to their collision. Howard has a positive view of the police, and prefers to be contacted by post or email, so these could be used to deliver messages to him.

2. **'Jonathan'** – in his early 40s, owns a detached house in a Group D and mostly white neighbourhood. He is educated to a degree level and is employed full time in the financial industry. Jonatan is generally ambitious, keen to further his position and adventurous in trying new things. He owns a bicycle which he uses to commute to work for multiple reasons: it is convenient to cycle; he believes in doing the right thing for the environment; and likes to keep fit. He tends to be injured in collisions on main roads, specifically at junctions (crossroads and T-junctions) and there are peaks in collisions at commuter times. Jonathan is often travelling straight ahead at the time of his collision (often with a car) and this might suggest that cars are exiting junctions into his path. Alternatively, the cars could be following or passing too close. This could suggest that visibility is an issue. He could perhaps be persuaded to improve how visible he is to other motorists (through clothing and high visibility additions to his bicycle, including the use of good quality lights) and the other motorists could be targeted through an awareness campaign (as other motorists 'fail to look properly'). There could also be a skills deficit that might need to be addressed – Jonathan is often considered to have contributed to his collisions through observation errors (failed to look properly or failed to judge other's path or speed), control errors (which include sudden braking, swerving and loss of control); and through unsafe behaviour (aggressive driving and careless, reckless or in a hurry). All these contributory factors suggest that some training could be beneficial. Jonathan has a positive of the police and likes using new technology; he uses social media such as Facebook and Twitter

weekly; his communication preference is by email for most marketing contacts with organisations. So, these could be potentially used to deliver messages to him.

3. **'Saeed'** – is an adolescent school boy, he comes from a deprived, multicultural neighbourhood (Group I), and is from a low-income household. His family do not own a car, therefore cycling for him is a necessity as he has limited alternative options for commuting to and from school. Saeed and his family do not exercise and only adopt environmentally-friendly practices when it can save them money. As a result, Saeed does not cycle for exercise or environmental reasons, but more so for being cost efficient than using public transport. Like Jonathan and Howard, Saeed is involved in collisions on main roads and often at T-junctions and crossroads, he is likely to be involved in a collision in the morning rush hour. The collision circumstances are similar, both in terms of contributory factors and the involvement of cars. A focus on increasing personal visibility might help reduce junction collisions. Saeed is a technology fan and likes having up-to-date gadgets. Technology could therefore possibly be used to deliver messages to him.

4. **'Jordan'** – is in his late 30s, comes from a deprived, multicultural neighbourhood (Group M), and is from a low-income household. He works in the water supply industry. He lives in a council, terraced home. He has two children aged between 11-15 years. He does not exercise and has low levels of environmental knowledge. Therefore, like Saeed, cycling is a necessity and more convenient and cost efficient than using public transport. Jordan tends to be injured in collisions on main roads, specifically at junctions (crossroads and T-junctions) and there are peaks in collisions at commuter times. Jonathan is often travelling straight ahead at the time of his collision (often with a car) and this might suggest that cars are exiting junctions into his path. Alternatively, the cars could be following or passing too close. This could suggest that visibility is an issue. He could perhaps be persuaded to improve how visible he is to other motorists (through clothing and high visibility additions to his bicycle, including the use of good quality lights) and the other motorists could be targeted through an awareness campaign (as other motorists 'fail to look properly').

SUMMARY OF OTHER EVIDENCE

The patterns observed amongst Berkshire resident pedal cycle user casualties have been observed elsewhere. Junctions, in particular, are associated with cyclist injuries and interventions aiming to reduce risk at junctions could be seen as a priority. In a national study of cycle collisions, almost two-thirds of cyclists killed or seriously injured were at or near junctions at the time of their incident. As with Berkshire residents, the main collision configurations involved a cyclist and car, with the car turning right or left while the cyclist was going straight ahead.[24]

> *Reducing the speed of traffic through junctions appears to be an effective approach to reducing cycle casualties and physical calming methods are a reliable means of achieving such a reduction.*
>
> *With regard to junction form, there is a convincing body of evidence that large roundabouts that maximise traffic speed and flow are a particularly risky junction type for cyclists and that*

> *the speed of motorised traffic through roundabouts is a good proxy for risk. Signalising, or possibly using more restricted geometries to reduce speed, is likely to reduce risk.*[25]

Recommendations were made to improve cycling safety made by the Parliamentary Committee on Transport Safety (PACTS) in a policy briefing note for a debate on cycling safety which took place in Westminster Hall on 23rd February 2012.[26]The PACTS recommendations include the ethos of shared responsibility where designers, builders and providers of road systems should ensure they pose as low a risk as reasonably practicable for cyclists. A second recommendation points to evidence showing that greater gains in increased cycle safety come from reducing motor vehicle speeds. It suggests "*lower speeds are particularly beneficial at junctions where most cycle injuries in multi-vehicle collisions take place*." [27] It recommended that cycle infrastructure should be well-planned, well-maintained, consistent, and legible to all road users and this will not only lead to road safety benefits but could also encourage more people to take up cycling.

The Briefing also discussed attitudes and found that the most important barriers to cycling are the behaviour of other road users and the volume and speed of traffic. It stated that cyclists respond to these barriers in one of four ways:

- *Complete avoidance of traffic*
- *Keeping out of the way and guarded*
- *Being assertive and staying in control of the situation*
- *Being opportunistic and making the most of the bike*[28]

It suggests that these attitudes could be tackled through cycle training; encouraging cyclists to make themselves safe and seen; and encouraging drivers to be more aware of the risks in interactions with cyclists.

The PACTS Briefing cited research undertaken for the Department for Transport by TRL and Simon Christmas that looked to assess the attitudes, perceptions and behaviour of cyclists and other road users.[29]Focus groups were used to discuss approaches to cycling and uncovered correlations between the way in which cyclists ride and their motivations for cycling. Those cycling as a social activity are likely to avoid heavy traffic because they can dictate their route whereas commuters are more likely to ride assertively and take control of the situation. The main areas of discussion were the interactions between cyclists and other road users – there were negative attitudes displayed by cyclists to other road users, and vice versa, and the other party was often seen as the cause of the problem. Across London, schemes aim to encourage empathy by firstly getting cyclists to climb into a HGV cab and understand the extent of the vehicle's blind spots and secondly, by providing cycle training to the drivers of council lorries and buses; trying to break down the barriers between cyclists and other road users is a positive step forward.

Other topics pertinent to cyclists were discussed within the focus groups. On the discussion of cycle helmets, riders were split between habitual and non-habitual wearers. The findings suggested that promoting cycle helmets might be difficult.

> *The key challenge here is that safety is, in fact, relatively unimportant in the way helmets are conceptualised, even by many of those who wear them: for while it is true that a helmet gives them peace of mind in situations that are perceived to be dangerous, it is probably not true*

> *that many of them have given very much thought to the nature of the safety afforded. As for those who are not wearing helmets, the evidence is that they see them less as safety gear than as fashion disasters. Shifting this perspective, by emphasising the dangers from which helmets can protect, might risk discouraging people from cycling in the first place.*[30]

It suggested that it might be better to convince inconsistent wearers to adopt cycle helmets more, rather than trying to convert non-wearers. A change of habit could be to encourage inconsistent wearers to use helmets on quieter routes and convince them that helmets are not just for children. One study of Hospital Episode Statistics and police fatal files concluded that if a cycle helmets had been worn, 7% of head injury cases in the hospital dataset may not have required hospital treatment and 10-16% of the fatalities in the police data may have been prevented. Due to the methodology, these could be conservative estimates.[31]

Regarding visibility, the focus groups found that some of the younger male riders were less inclined to use lights on their cycles.

> *It is noteworthy in this connection that cyclists between 16 and 29 are more than twice as likely to be killed or seriously injured (KSI) at night (9pm to 3am) than any other age group – though this figure may also reflect increased exposure owing to lifestyle patterns.*[32]

Participants were inclined to see the road safety benefits of high visibility clothing but this did not necessarily translate into their behaviour.

> *Moreover, the promotion of high-visibility clothing (and, again, even more so of lights and reflectors), could deliver additional benefits as part of any effort to promote better road sharing – since making yourself visible was widely conceived, by cyclists and ORUs [other road users], as something cyclists can do for ORUs.*[33]

In 2000, RoSPA conducted a survey of adult cyclist training in Scotland to determine the provision of training and the level of demand from cyclists themselves. Questionnaires were distributed via road safety officers, cycling groups and randomly to gauge levels of cycling and training needs amongst different groups. Around half of the respondents across all groups felt that they would benefit from a cyclist training course and two-thirds would be willing to pay for a course. Courses should be held locally and include training on: safety equipment; roadcraft; the Highway Code; cycle awareness; cycle maintenance; and current legislation. Route planning and off-road skills were also popular topics. Respondents felt that courses should be organised for small groups, rather than offered on a one-to-one basis and that evenings and weekends would be the best times for them to be held.[34]In 2005, the National Standard for cycle training was developed by over 20 organisations and is maintained by the Department for Transport.[35]Berkshire has been offering adult cycle training to this standard since 2007.

APPENDIX A – MOSAIC SUPERGROUP COMPOSITION

Super Group	Definition	Group	Group Definition
A	Rural and small town inhabitants	A	Residents of isolated rural communities
		B	Residents of small and mid-sized towns with strong local roots
B	Affluent households	C	Wealthy people living in the most sought after neighbourhoods
		D	Successful professionals living in suburban or semi-rural homes
C	Middle income families	E	Middle income families living in moderate suburban semis
		F	Couples with young children in comfortable modern housing
D	Young people starting out	G	Young, well-educated city dwellers
		H	Couples and young singles in small modern starter homes
E	Lower income residents	I	Lower income workers in urban terraces in often diverse areas
		J	Owner occupiers in older-style housing in ex-industrial areas
		K	Residents with sufficient incomes in right-to-buy social housing
F	Elderly occupants	L	Active elderly people living in pleasant retirement locations
		M	Elderly people reliant on state support
G	Social housing tenants	N	Young people renting flats in high density social housing
		O	Families in low-rise social housing with high levels of benefit need

APPENDIX B – CONTRIBUTORY FACTOR GROUPINGS

Injudicious Action	Driver Errors or Reactions	Driver Impairment or Distraction	Behaviour or Inexperience	Other
Traffic Contraventions	**Manoeuvre Errors**	**Substance Impairments**	**Nervous Behaviour**	**Vehicle Defects**
Disobeyed automatic traffic signal	*Poor turn or manoeuvre*	*Impaired by alcohol*	*Nervous, uncertain or panic*	*Tyres illegal, defective or under-inflated*
Disobeyed double white lines	*Failed to signal or misleading signal*	*Impaired by drugs (illicit or medicinal)*	*Learner or inexperienced driver/rider*	*Defective lights or indicators*
Disobeyed 'Give way' or 'Stop' signs or markings	*Passing too close to cyclist, horse rider or pedestrian*		*Inexperience of driving on the left*	*Defective brakes*
Disobeyed pedestrian crossing facility			*Unfamiliar with model of vehicle*	*Defective steering or suspension*
Illegal turn or direction of travel				*Defective or missing mirrors*
				Overloaded or poorly loaded vehicle or trailer
Speed Choices	**Control Errors**	**Distraction**	**Unsafe Behaviour**	**Road Surface**
Exceeding speed limit	*Sudden braking*	*Driver using mobile phone*	*Aggressive driving*	*Poor or defective road surface*
Travelling too fast for conditions	*Swerved*	*Distraction in vehicle*	*Careless, reckless or in a hurry*	*Deposit on road (e.g. oil, mud, chippings)*
	Loss of control	*Distraction outside vehicle*		*Slippery road (due to weather)*
Close Following	**Observation Error**	**Health Impairments**	**Pedal Cycle Behaviour**	**Affected Vision**
Following too close	*Failed to look properly*	*Uncorrected, defective eyesight*	*Vehicle travelling along pavement*	*Stationary or parked vehicle(s)*
	Failed to judge other person's path or speed	*Illness or disability, mental or physical*	*Cyclist entering road from pavement*	*Vegetation*
			Not displaying lights at night or in poor visibility	*Road layout (e.g. bend, winding road, hill crest)*
			Cyclist wearing dark clothing at night	*Buildings, road signs, street furniture*
	Junction Errors	**Fatigue Impairment**	**Pedestrian Behaviour**	*Dazzling headlights*
	Junction overshoot	*Fatigue*	*Crossing road masked by stationary or parked vehicle*	*Dazzling sun*
	Junction restart (moving off at junction)		*Failed to look properly*	*Rain, sleet, snow or fog*
			Failed to judge vehicle's path or speed	*Spray from other vehicles*
			Wrong use of pedestrian crossing facility	*Visor or windscreen dirty or scratched*
			Dangerous action in carriageway (e.g. playing) *Careless, reckless or in a hurry* *Impaired by alcohol* *Impaired by drugs (illicit or medicinal)* *Pedestrian wearing dark clothing at night* *Disability or illness, mental or physical*	*Vehicle blind spot*

COVER IMAGE – Alexander Baxevanis https://www.flickr.com/photos/futureshape/

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