



DfT Safer Roads Fund
Slough A4

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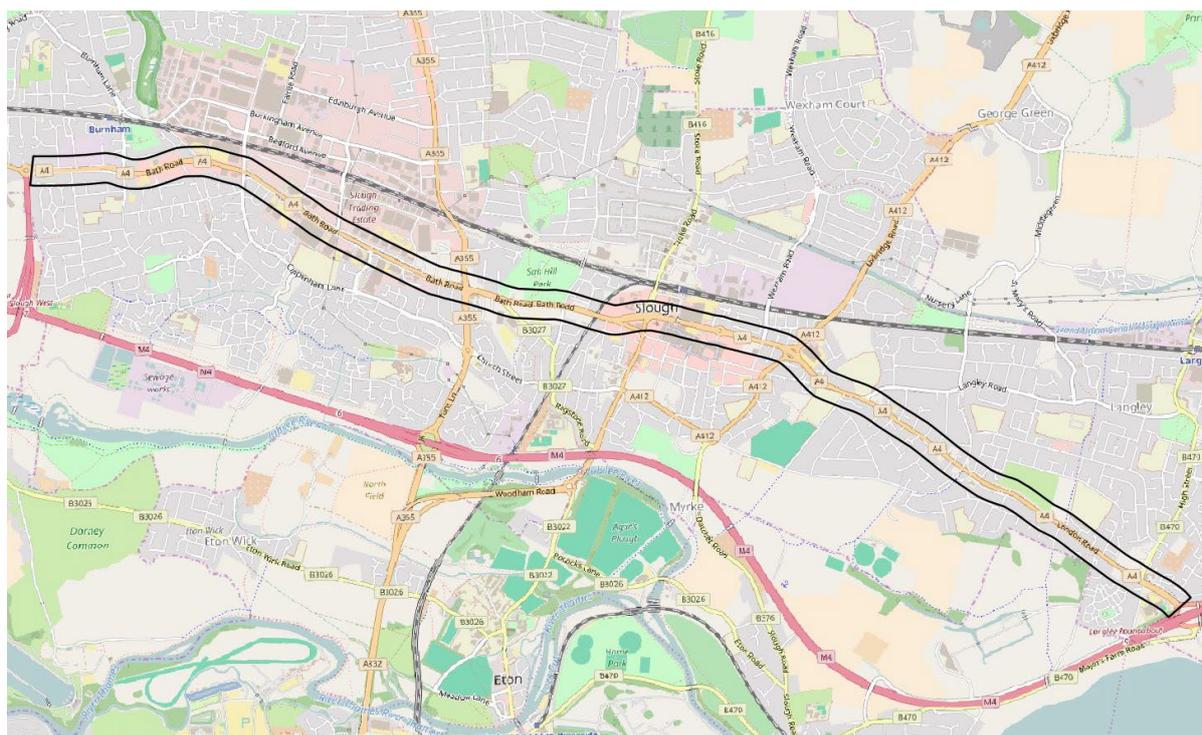
INTRODUCTION

In 2017 Slough Borough Council (SBC) and Agilysis worked together on a submission to the Department for Transport 'Safer Roads Fund' to improve road safety on the A4 through Slough. This bid was an invitation-only opportunity and was based on previous analysis of risk on 50 selected roads. The project was approved with a value of £1.177m, originally proposed to take place over two financial years. Funding has been awarded and the project can take place from the 20-21 FY. The economic case was based on a benefit-cost ratio (BCR) of 8.

The headline description of the plan in the approved bid was as follows:

Speed limits will be homogenised to 30mph along the route with enforcement solutions implemented to achieve compliance with the new limit and existing signals. Roadside hazards will be removed or protection introduced in many places and a limited amount of surface rehabilitation will be required to improve friction at key locations. Locations have been prioritised for countermeasures based on collision histories and potential risk using the iRAP ViDA tool.

Following consultations with SBC it has been identified that in the period since the scheme was designed a number of local and national priorities have changed, and this coupled with a delay in the DfT funding means there is now an opportunity to review the original plans and tailor the scheme to meet the challenges faced in 2021 and beyond.



An outline plan has been discussed for a limited level of support by Agilysis in the implementation of the scheme. This will not be a 'hands-on' role on managing engineering or enforcement schemes, but will provide sufficient support and guidance to assist officers in the successful roll-out of road safety interventions along the route.

This Phase 2 report will outline the process undertaken to assess potential changes and priorities along this route of the A4 through Slough. In this phase we have reviewed original analysis and proposal put forward to the DfT and considered whether changes need to be made to the proposed countermeasures. This reflects any changes to the road, either implemented or planned since the

original proposal, together with any new traffic or speed data. Due to the approach used in the original proposal, which focusses largely on road danger, collision data will not be used as the primary source of information to determine appropriate interventions. However, we recognise that historic collision information provides a complementary perspective and can be valuable in sense-checking some of the subsequent recommendations.

In order to re-analyse the road features in the iRAP ViDA tool¹, we have commissioned a new video survey and data, with assistance provided from the Road Safety Foundation who are the UK experts in the implementation and training of local authorities in this technique.

We are keen to ensure that any proposed changes do not result in a reduction in the benefit cost ratio (BCR), and safety rating along the A4.

WORK ELEMENTS

As agreed in the original proposal the following work is being undertaken in this phase:

1. Gather information from SBC on any changes to the A4 since the initial analysis period and bid submission
2. Gather information on collisions, traffic volumes and speeds for 2019 compared to 2016 (as used in the submission).
3. Gather information on collisions, traffic volumes and speeds for 2020 compared to 2016 (as used in the submission).
4. Re-enter data to the ViDA software and re-run the user defined intervention plan (UDIP) to consider the original plans, plus any potential changes that will draw a greater benefit and / or reflect the changes identified in Part 1
5. Meet with the SBC team to approve any outline proposals prior to the final plans being calculated
6. Produce a final scheme blueprint for any submission to DfT (if required) and implementation by SBC.

This version of the report contains the elements and results of phases 1-4 and directly informs elements 5 and 6 which will be addressed through a meeting with SBC in April.

COLLISION ANALYSIS

As mentioned above, it is helpful to profile the casualty history. This section analyses the collisions on the A4 in Slough between the M4 Junction 7 spur and the M4 Junction 5. The analysis is divided into 3 road sections.

1. M4 Junction 7 Spur to the A355 Farnham Road
2. A355 Farnham Road to A412 Uxbridge Road
3. A412 Uxbridge Road to the M4 Junction 5

METHODOLOGY

The collision criteria used were as follows:

- Collisions over a 5 year period (2016-2020)
- A collision match distance of 50 metres

All tools used in this report have been provided by the Agilysis Analytics department.

¹ <https://vida.irap.org/en-gb/home>

SUMMARY

Looking at the route, all three sections followed a similar pattern. Collisions involving cars were highest, most likely to involve two vehicles and result in a single casualty.

The section between the A355 and A412 resulted in the most collisions, this section does have the bus/rail transport interchanges and the main retail centre, so is likely to have increased traffic, although the ratio of Collision to Vehicles to Casualties remained largely the same in each section.

Weather was not a significant factor, with most collisions occurring in 'fine weather', on 'dry roads' and in slightly more in 'daylight'.

A collision is more likely to occur at a junction and involve a male driver between 26 and 55, with 26-35 being highest and when combined, either commuting to work or travelling as part of work

A collision is more like to result in a recording of a 'slight' injury with KSI more often being attributed to a VRU driver, either pedal cyclist or motor cyclist in road sections 1 and 3. There were significantly more pedestrian KSI's in section 2 between the A355 and A412. As mentioned above, this section does have the bus/rail transport interchanges and the main retail centre, with the A4 running between the two.

Pedestrian casualties were more likely to be 'slight' and injured at a crossing, especially in the act of crossing the road.

Of all recorded collisions the overriding factor was 'failing to look properly' or 'failing to judge the other persons path or speed', whether attributed to a driver or a pedestrian. Often drivers were 'careless, reckless or in a hurry' and 'Disobeying an automatic traffic signal'.

RESULTS

Section One – M4 Junction 7 Spur Roundabout to A355 Farnham Road.

Section One runs from the Entry/Exit of the M4 Junction 7 Spur roundabout to the junction with the A355 Farnham Road at The Three Tuns.

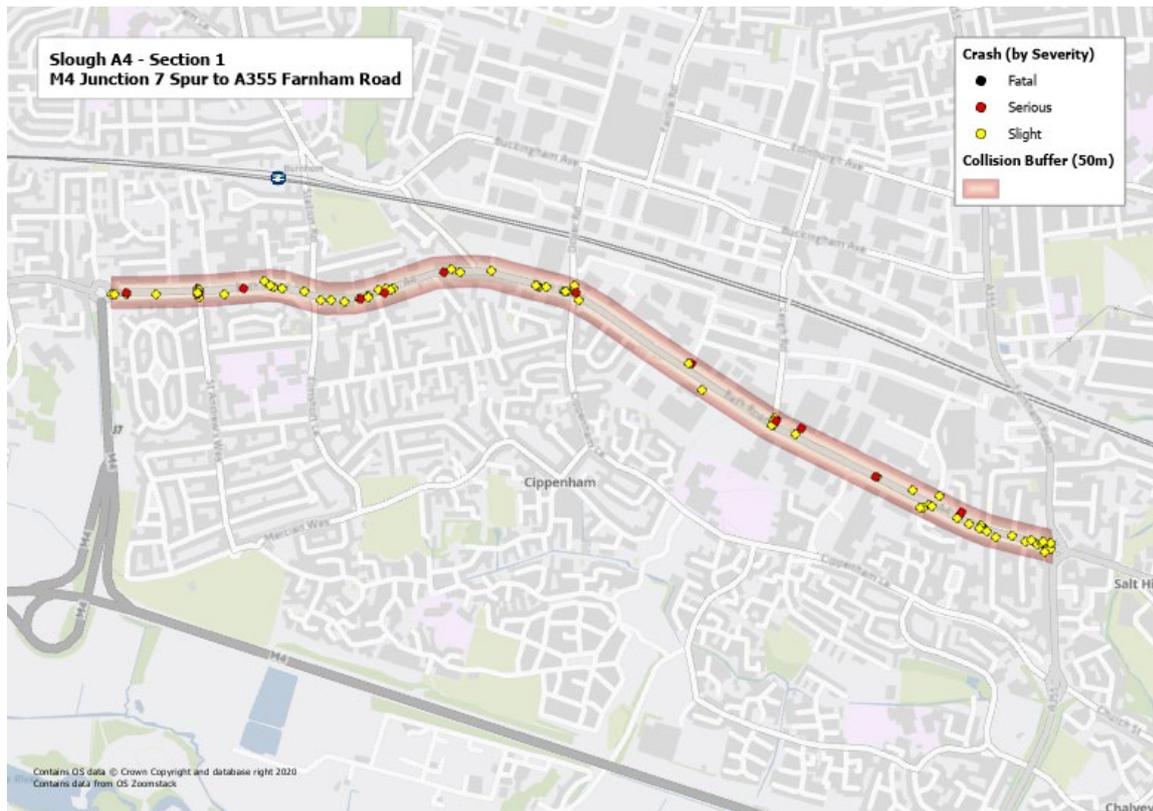


Figure 1 – Map of Section 1: M4 Junction 7 Spur Roundabout to A355 Farnham Road.

Section One is approximately 3.2km in length with a speed limit of 40mph changing to 30mph approximately 530m West of the junction with the A355.

There were a total of **93** crashes, involving **176** vehicles, resulting in **122** casualties.

Looking at the collisions spatially, **51** occurred between the M4 junction roundabout and the Dover Road/Chippenham Lane crossroads.



Figure 2 – Map of part of Section 1: M4 Junction 7 Spur Roundabout to Dover Road/Chippenham Lane crossroads.



With only **13** occurring between the Dover Road/Chippenham Lane crossroads and the start of the 30mph limit East of Twinch Lane, **7** of these around the junction of Leigh Rd.

Figure 3 – Map of part of Section 1, Dover Road/Chippenham Lane crossroads to start of 30mph limit (Twinch Lane)



There were **29** recorded between Twinch Lane and the A355 Farnham Road junction, with **9** within 50m of the A355 junction.

Figure 4– Map of part of Section 1, Start of 30mph limit (Twinch Lane) to A355 Farnham Road junction

Crashes

Of the **93** crashes between M4 Junction 7 Spur Roundabout and the junction with the A355 Farnham Road, **80** were recorded as slight, **13** serious and no fatalities.

Slight	80
Serious	13
Fatal	0

Table 1 – Crashes by Severity in Section 1 2016 to 2020

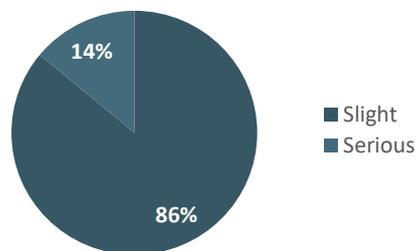


Figure 5 – Percentage of crashes by severity in section 1 2016 to 2020

Collisions dropped sharply from **29** to **18** between 2016 and 2017, this has slowed since then, with the percentage of KSI collisions dropping from **27%** to **13%** between 2016 and 2019. Collisions fell to **13** in 2020 with only one recorded as KSI.

Year	Fatal	Serious	KSI	Slight	Total
2016		8	8	21	29
2017				18	18
2018		2	2	16	18
2019		2	2	13	15
2020		1	1	12	13

Table 2 – Collisions in section 1 by year and severity

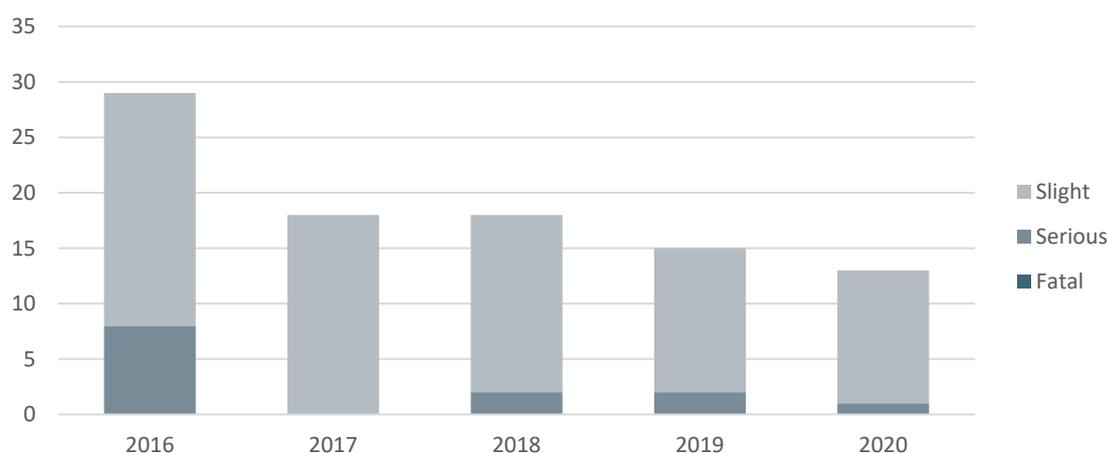


Figure 6 – Collisions in section 1 by year and severity

Collisions involving **2** Vehicles were highest, at **64 (69%)** followed by **21** single vehicle collisions (**22%**). Collisions involving **3** or more vehicles accounting for **8%** of all recorded collisions.

Number of Vehicles	Fatal	Serious	KSI	Slight	Total
1		4	4	17	21
2		8	8	56	64
3		1	1	5	6
4				1	1
5+				1	1

Table 3 – Collisions in section 1 2016 to 2020 by number of vehicles involved

There were **70 (75%)** collisions with a single casualty, of these **8** were KSI, but none were fatal.

Number of Casualties	Fatal	Serious	KSI	Slight	Total
1		8	8	62	70
2		5	5	13	18
3				4	4
4				1	1
5+					

Table 4 – Collisions in section 1 2016 to 2020 by number of resulting casualties

The majority of collisions, **81 (87%)** occurred in fine weather, with the remaining **12** occurring in the rain. **71 (76%)** collisions occurred when the roads were dry and the remaining **22** on damp or wet roads.

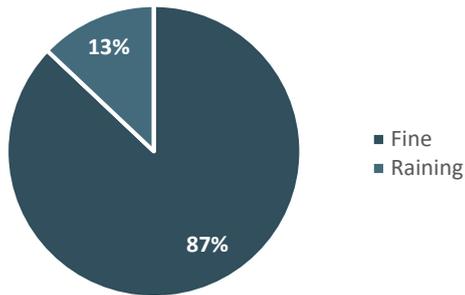


Figure 7 – Percentage of collisions in section 1 2016 to 2020 by weather conditions

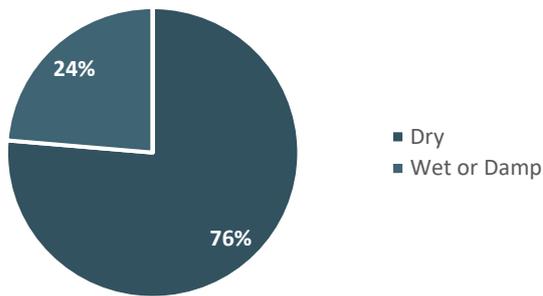


Figure 8 – Percentage of collisions in section 1 2016 to 2020 by road surface conditions

Of the **13** KSI collisions, **11** were recorded as fine weather with only **2** in the rain, with **10** of the KSI collisions occurring on dry roads.

59 (64%) collisions occurred in Daylight, of the **32** in Darkness **1** was recorded as 'Darkness (no lighting)' and **1** 'Darkness (lighting unknown)'.

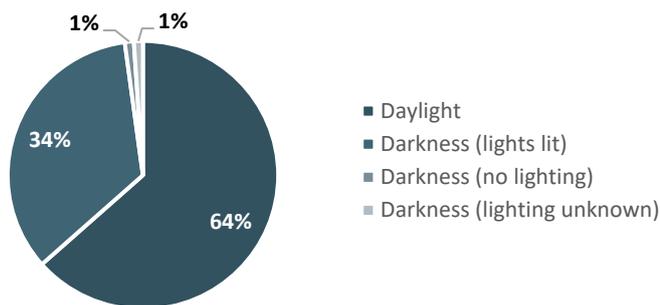


Figure 9 – Percentage of collisions in section 1 2016 to 2020 by lighting conditions

Of all collisions, **57 (61%)** occurred at junctions, **29 (31%)** at a T-Junction and **28 (30%)** at crossroads. **16 (17%)** did not occur at a junction and **15 (16%)** occurred at a private drive.

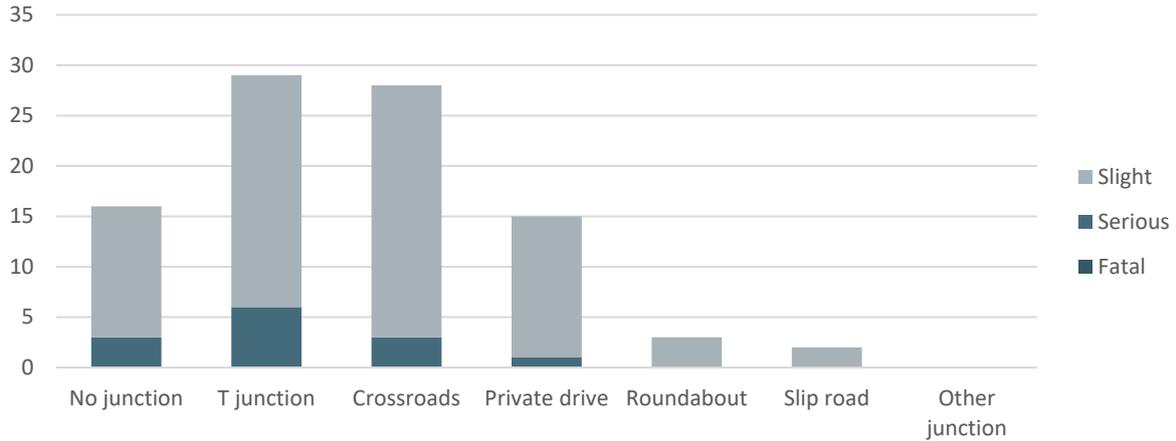


Figure 10 – Collisions in section 1 2016 to 2020 by junction detail

Of the **13** KSI collisions, **6** occurred at a T-Junction, **3** at a crossroads and **3** not at a junction. **34 (37%)** of collisions were recorded at a signal crossing, the majority, **54 (58%)** did not occur at a crossing.

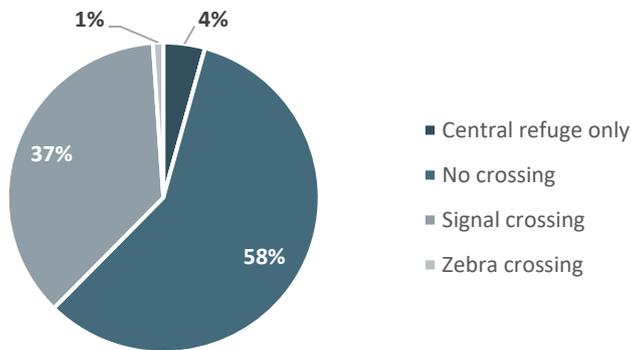


Figure 11 – Percentage of collisions in section 1 2016 to 2020 by pedestrian crossing

The highest number of VRU Casualties were Pedestrians, **19**, of those, **4 (21%)** were KSI. This was followed by Pedal Cyclists **16**, with **1 (6%)** KSI casualty. There were **12** Motorcycle casualties, of which, **5 (41%)** were KSI. There were **12** child casualties, with **1 (8%)** KSI.

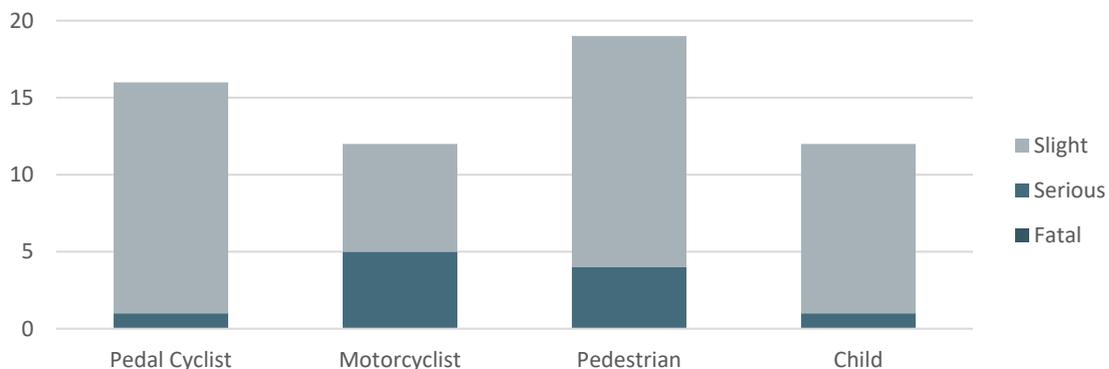


Figure 12 – Collisions in section 1 2016 to 2020 involving Vulnerable Road Users (VRU) by VRU type and severity

The majority of collisions involved cars, **62**, this included **7 (11%)** KSI collisions. There were **23** collisions involving a young driver, **4 (17%)** of these were KSI. Pedal Cyclists were involved in **16** collisions, with **1 (6%)** KSI casualty. Of the **13** collisions involving a motorcycle **6 (42%)** were KSI collisions

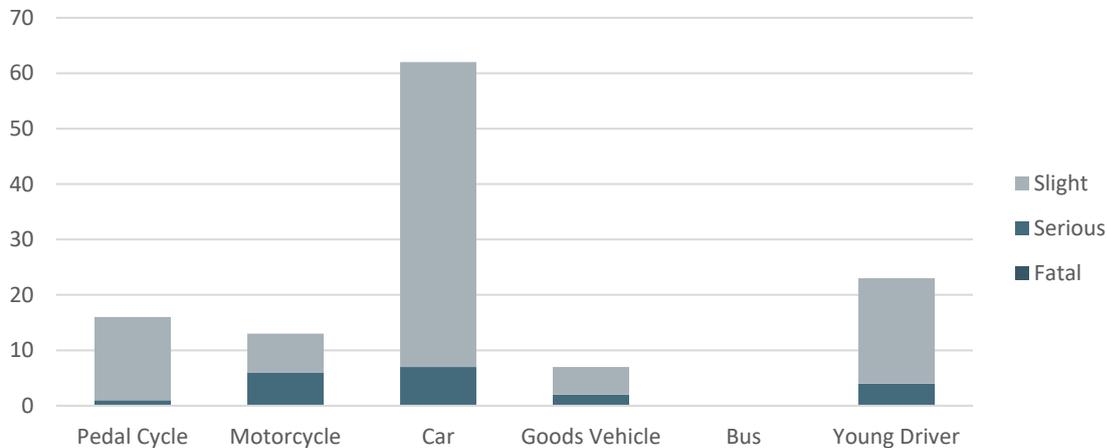


Figure 13 – Collisions in section 1 2016 to 2020 by vehicle involved and severity

Collisions tend to occur during the morning and evening peaks, Monday through Friday, although this shifts to earlier in the afternoon on Fridays.

	00:00	01:00	02:00	03:00	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
Monday									2					1	1	2		4	2	1	1			
Tuesday							2	1	1	1			1					4	2				1	1
Wednesday								2	3	1	1	2	1		1		2	2	1	1	3	2		
Thursday							2		1					1	1			1		4				
Friday	1						1		2						4	3	1				1			1
Saturday					1				1			2		1				1			1		1	1
Sunday	1		1								1	1		1	1	2		1	1					

Figure 14 – Number of collisions in section 1 2016 to 202 by day of week and hour of day

Vehicles

There were **176** vehicles involved in collisions between M4 Junction 7 Spur Roundabout and the junction with the A355 Farnham Road.

Of these **128 (72%)** were cars, with next highest, Pedal Cycles **17 (10%)** and Goods Vehicles (under 3.5 tonnes) **11 (6%)**.

Combined, Motorcycles accounted for **11 (6%)** of vehicles involved, but these were mainly below 125cc, with **5** or above 500cc with **5**.

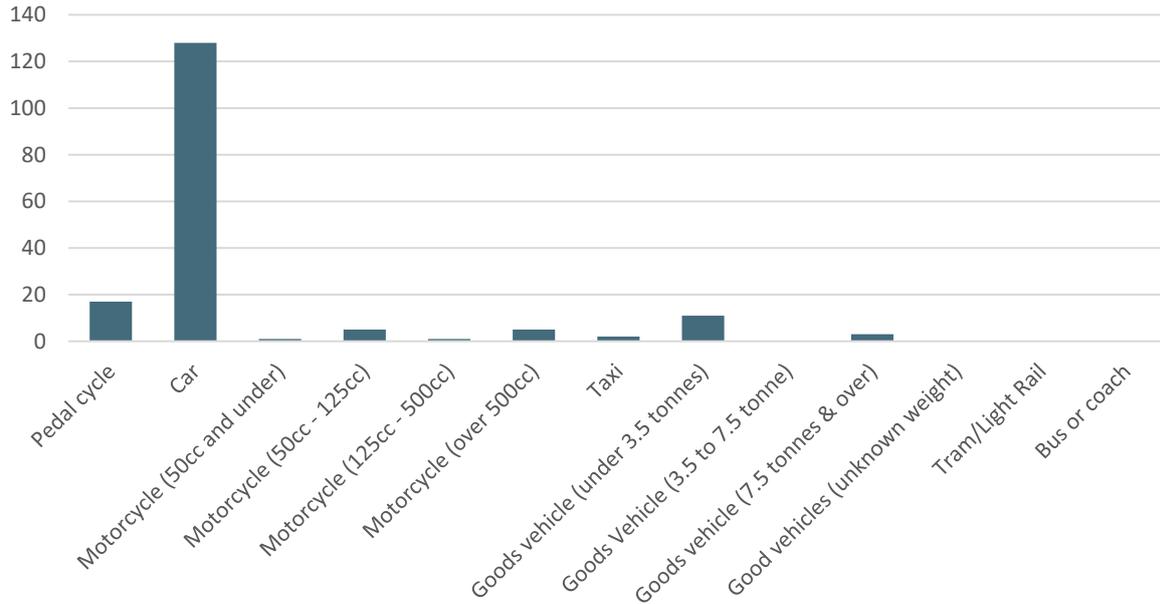


Figure 15 – Number of vehicles involved in section 1 2016 to 2020 by type

The majority of drivers were male **124 (70%)**, with **46 (26%)** female.

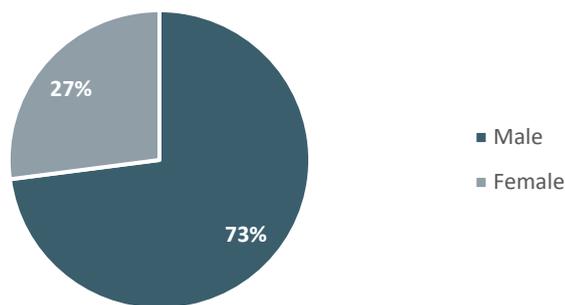


Figure 16 – Percentage breakdown of sex of driver in section 1

When looking at Driver Age, the highest numbers were for drivers from 26 to 55, with **38 (22%)** 26 & 35, **36 (20%)**, 36 & 45 and **26 (15%)** 46 & 55, with drivers 56 to 55 **16 (9%)**. Younger drivers 21 to 25 accounted for **19 (11%)** and drivers 16-20 **14 (8%)** of all drivers.

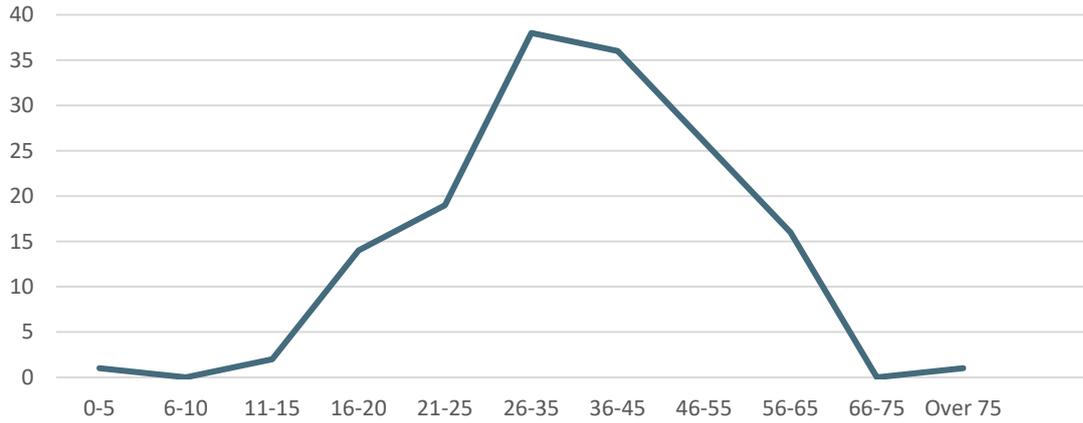


Figure 17 – Driver numbers in section 1 2016 to 2020 by age range

Of recorded Journey purpose, **57 (32%)** were recorded as other, a further **55 (31%)** were unknown, **33 (19%)** were recorded as part of work and **29 (16%)** commuting to/from work. With only **2** recorded as relating to the school run.

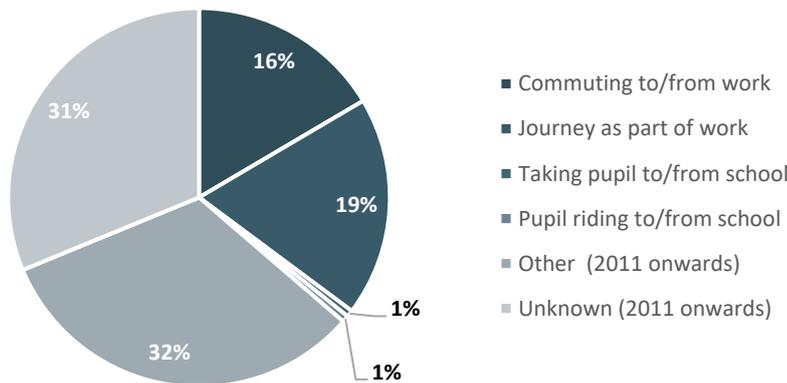


Figure 18 – Percentage of vehicles in section 1 2016 to 2020 by journey purpose

Casualties

Of the **122** recorded casualties between M4 Junction 7 Spur Roundabout and the junction with the A355 Farnham Road., **75 (61%)** were male and **47 (39%)** were female.

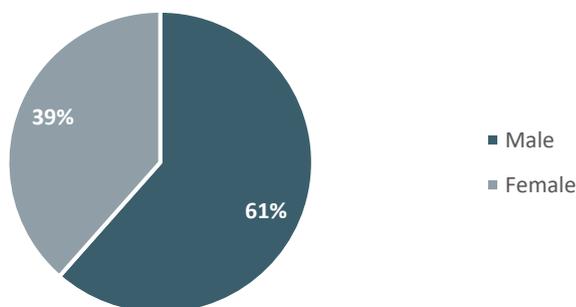


Figure 19 – Percentage of casualties in section 1 2016 to 2020 by sex

109 (89%) casualties were recorded as slight and **13 (11%)** serious, with no fatalities.

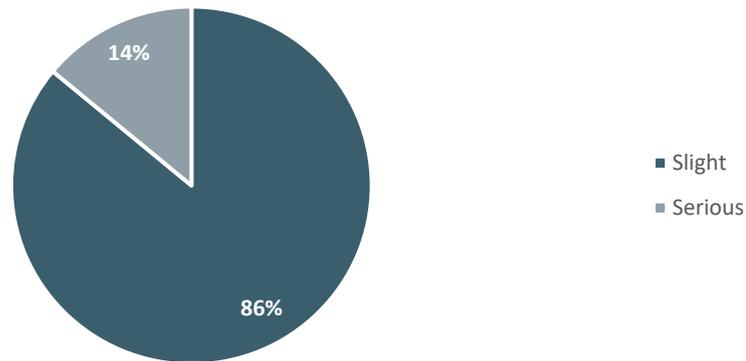


Figure 20 – Percentage of casualties in section 1 2016 to 2020 by severity

76 (62%) of casualties were the driver and **26 (21%)** a passenger, with **20 (17%)** recorded as a pedestrian. Of the **76 Driver** casualties, **28 (37%)** were a VRU casualty (**16 Pedal Cyclist** and **12 Motorcyclist**).

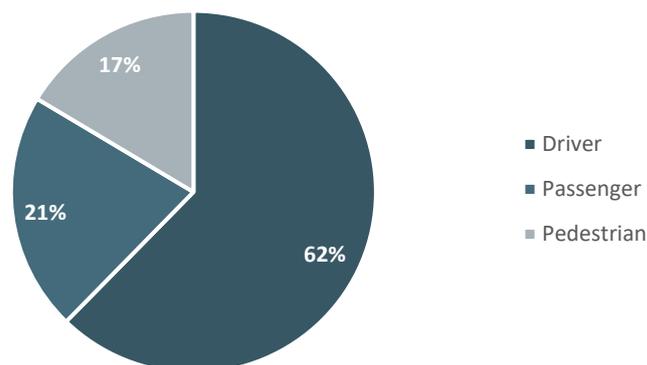


Figure 21 – Percentage of casualties in section 1 2016 to 2020 by class

When looking at age, casualties largely follow the vehicle involved with the majority of casualties between 26 and 55 years of age. **31 (25%)** were 26 to 35, **24 (20%)** 36 to 45 and **17 (20%)** 46 to 55. This was followed by younger drivers, with **16 (13%)** 16 to 20 and **12 (10%)** 21 to 25.

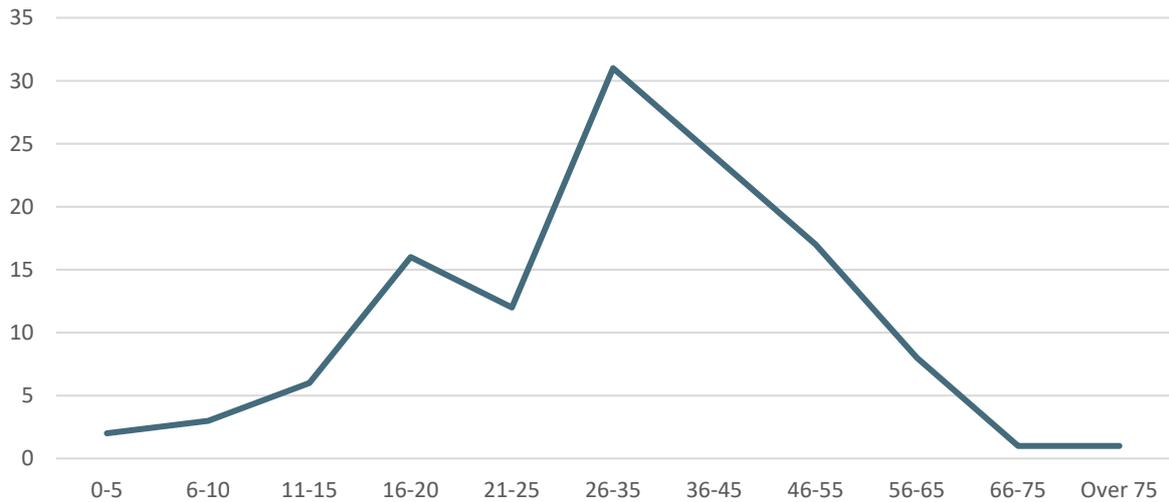


Figure 22 – Breakdown of casualties in section 1 by age band

Of the 20 pedestrian casualties, those at a crossing were the most common casualty with **16 (80%)**.

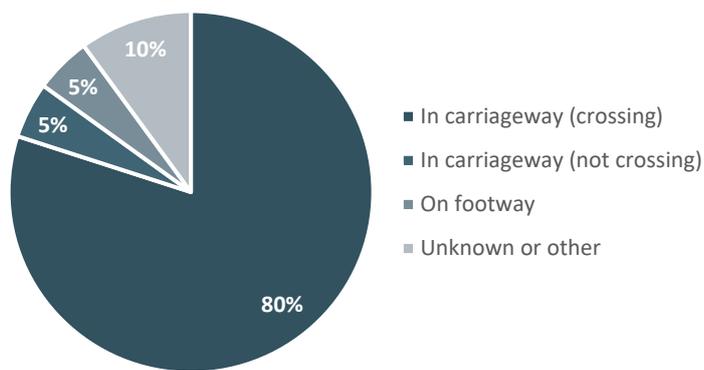


Figure 23 – Percentage of pedestrian casualties in section 1 2016 to 2020 by location

12 (60%) pedestrians were in the act of crossing the road.

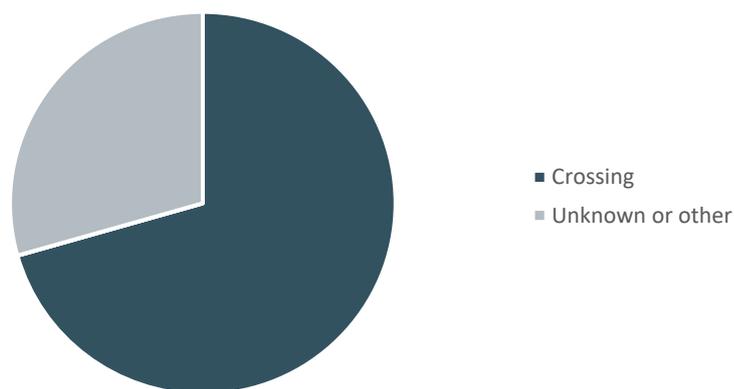


Figure 24 – Percentage of pedestrian casualties in section 1 2016 to 2020 by movement

Contributory Factors

The most common Contributory Factor (CF) for drivers was '405 – Driver Failed to Look Properly' of which **44** were recorded, **30** of these were recorded as Contributory Factor 1.

The second most common CF was '406 – Failed to Judge Other Persons Path or Speed' with **20** recorded, with a similar number **19** recording of '602 – Careless, Reckless or in a Hurry'. '306 – Exceeding Speed Limit' was recorded **6** times

Of CFs attributed to Pedestrians, the most common were recorded as '802 – Failed to Look Properly' with **10**, and '808 – Careless, Reckless or in a Hurry' with **5**.

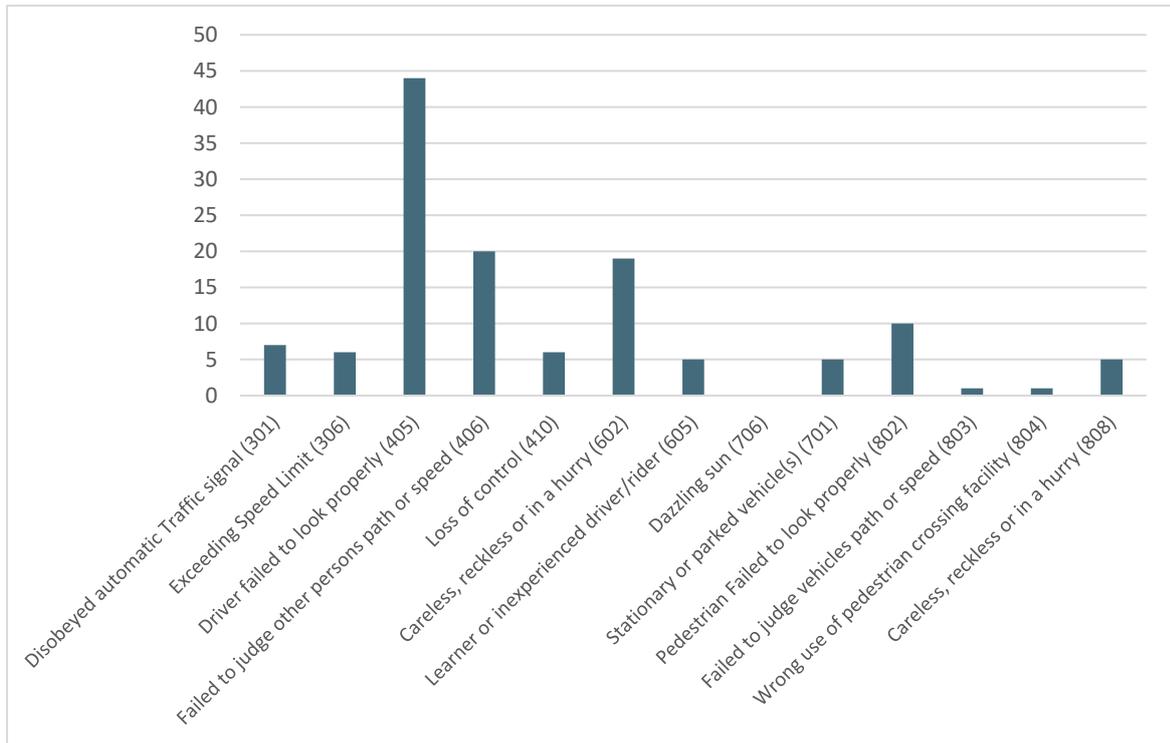


Figure 25 – Breakdown of collisions in section 1 2016 to 2020 by Contributory Factor

Section Two –A355 Farnham Road to A412 Uxbridge Road.

Section Two runs from the A355 at The Three Tuns to the roundabout with the A412 Uxbridge Road.



Figure 26 – Map of Section 2: A355 at The Three Tuns to the roundabout with the A412 Uxbridge Road.

Section Two is approximately 2.25km in length with a speed limit of 30mph for the entire length of the section.

There were a total of 121 crashes, involving 221 vehicles, resulting in 152 casualties.



Looking at the collisions spatially, Collisions tend to be clustered around junctions. There were **7** collisions within 50m of the Junction of the A355 Farnham Road and a cluster of **11** collisions around the junction with Stoke Poges Lane

Crashes

Of the 121 crashes between the junction with the A355 Farnham Road and the A412 Uxbridge Road roundabout junction, 104 were recorded as slight, 16 serious and 1 fatal.

By Severity	
Slight	104
Serious	16
Fatal	1

Table 5 – Crashes by Severity in Section 2 2016 to 2020

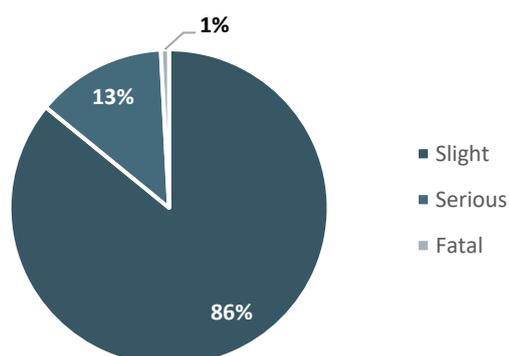


Figure 30 – Percentage of crashes by severity in section 2 2016 to 2020

Collisions rose sharply from **22** to **35** between 2016 and 2017, returning to a similar level as 2016 from 2018 onwards, dropping only slightly in 2019 and rising in 2020 to **23**.

Although the percentage of KSI collisions dropped comparatively from **9%** to **6%** between 2016 and 2017, they have increased and since then with **22%** of collisions recorded as KSI in 2020.

There was **1** fatality recorded in 2016

Year	Fatal	Serious	KSI	Slight	Total
2016	1	1	2	20	22
2017		2	2	33	35
2018		4	4	17	21
2019		4	4	16	20
2020		5	5	18	23

Table 6 – Collisions in section 2 by year and severity

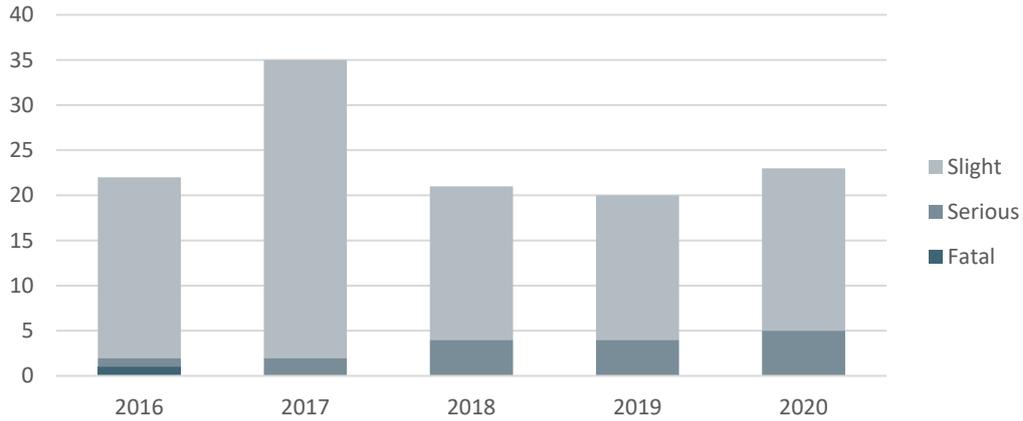


Figure 31 – Collisions in section 2 by year and severity

Collisions involving **2** Vehicles were highest, at **84 (69%)** followed by **25** single vehicle collisions (**21%**). Collisions involving **3** or more vehicles accounting for **10%** of all recorded collisions.

Number of Vehicles	Fatal	Serious	KSI	Slight	Total
1	1	7	8	17	25
2		6	6	78	84
3		2	2	6	8
4		1	1	2	3
5+				1	1

Table 7 – Collisions 2016 to 2020 in section 2 by number of vehicles involved

There were **96** collisions with a single casualty, of these **16** were KSI, and one was fatal.

Number of Casualties	Fatal	Serious	KSI	Slight	Total
1	1	15	16	80	96
2				21	21
3		1	1	1	2
4				2	2
5+					

Table 8 – Collisions 2016 to 2020 in section 2 by number of resulting casualties

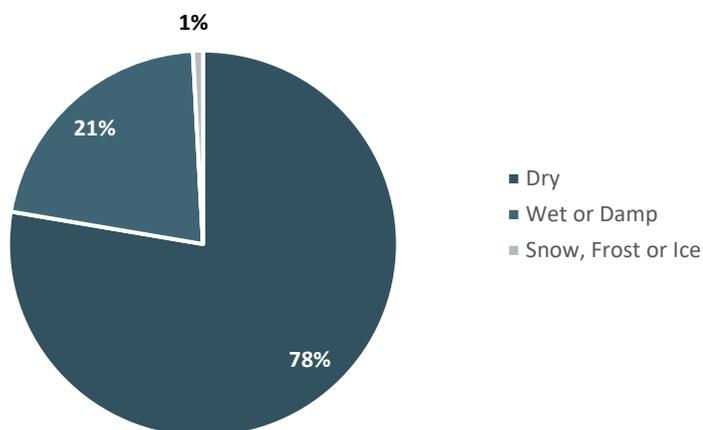


Figure 32 – Percentage of collisions 2016 to 2020 in section 2 by weather conditions

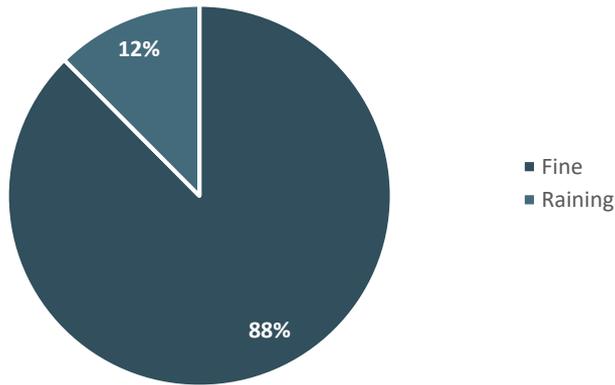


Figure 33 – Percentage of collisions in section 2 2016 to 2020 by road surface conditions

The majority of collisions, **106 (88%)** occurred in fine weather, with the remaining **15** occurring in the rain. **94 (78%)** collisions occurred when the roads were dry and of the remaining **27**, **26** occurred on damp or wet roads and **1** in Snow, Frost or Ice.

Of the **17** KSI collisions, **15** were recorded as fine weather, including the **1** fatality, with only **2** in the rain, with **15** of the KSI collisions occurring on dry roads and **2** on Wet or Damp roads.

78 (64%) collisions occurred in Daylight, of the **43** in Darkness only **1** was recorded as ‘Darkness (no lighting)’.

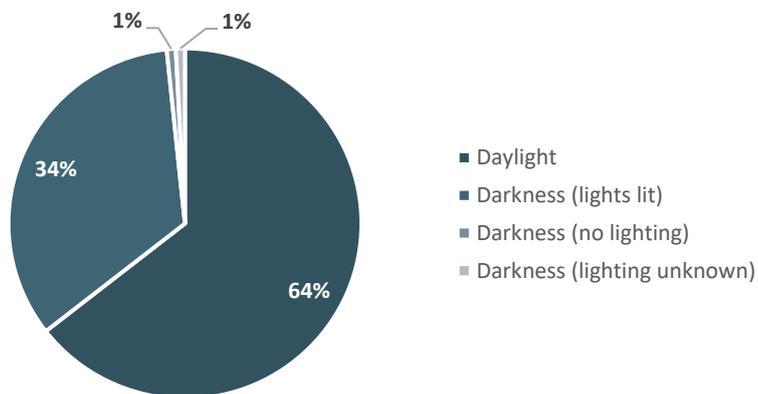


Figure 34 – Percentage of collisions in section 2 2016 to 2020 by lighting conditions

Of all collisions, **83 (69%)** occurred at junctions, **24 (20%)** at a T-Junction, **39 (32%)** at crossroads and **20 (17%)** at a roundabout. **27 (22%)** did not occur at a junction, **8 (7%)** occurred at a private drive and **1** on a slip road.

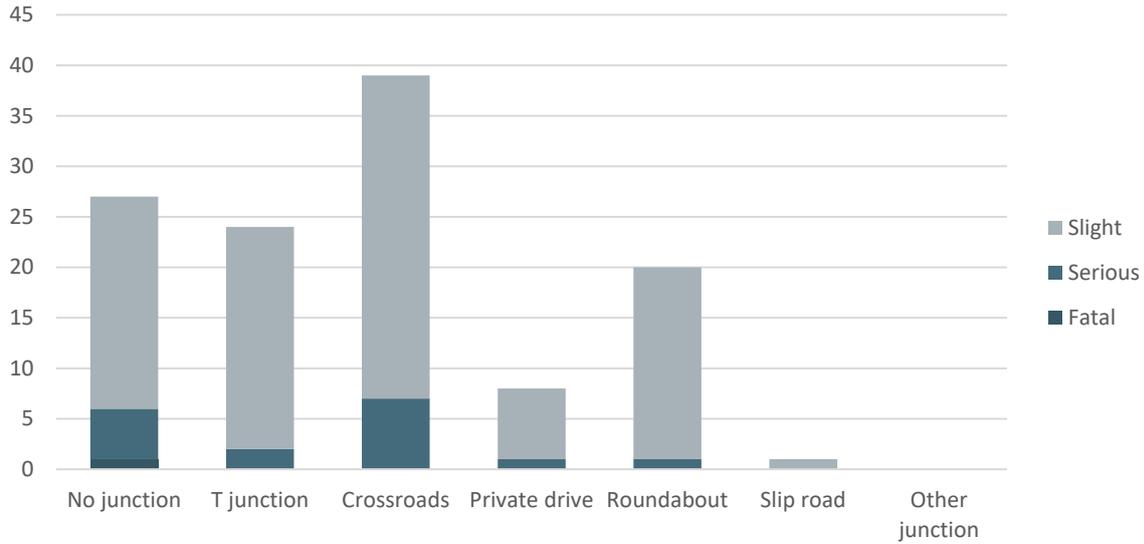


Figure 35 – Collisions in section 2 2016 to 2020 by junction detail

Of the 17 KSI collisions, 7 were recorded at a crossroads, 6 not at a junction and 2 were recorded at a T-Junction. 60 (50%) of collisions were recorded at a signal crossing, 55 (45%) did not occur at a crossing and 4 (3%) were recorded as at a Zebra crossing.

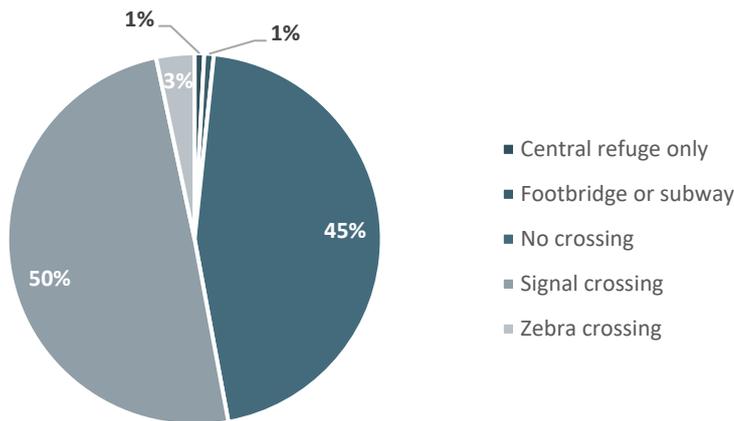


Figure 36 – Percentage of collisions in section 2 2016 to 2020 by pedestrian crossing

The highest number of VRU Casualties were Pedestrians, 24, of those, 9 (38%) were KSI, including 1 fatality. This was followed by Pedal Cyclists 18, with 2 (11%) KSI casualties. There were 10 Motorcycle casualties, of which, 4 (40%) were KSI. There were 11 child casualties, with no recorded KSI's.

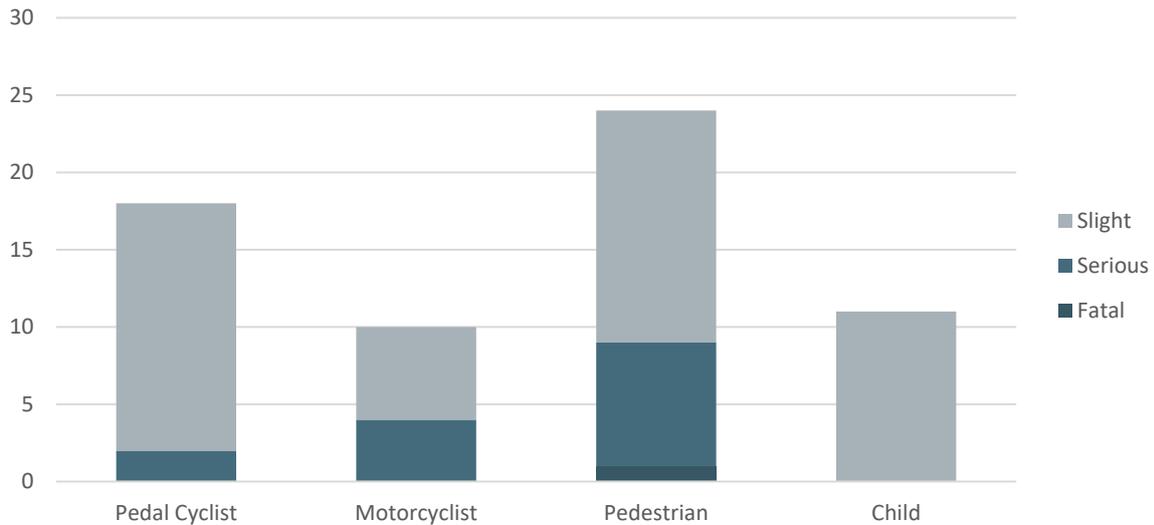


Figure 37 – Collisions in section 2 2016 to 2020 involving Vulnerable Road Users (VRU) by VRU type and severity

The majority of collisions involved cars, **77**, this included **8 (11%)** KSI collisions. There were **17** collisions involving a young driver, none of these were KSI.

Pedal Cyclists were involved in **18** collisions, with **2 (11%)** KSI casualties. Of the **10** collisions involving a motorcycle **4 (40%)** were KSI collisions.

There were **10** collision involving Goods Vehicles, **3 (30%)** were KSI, including **1** fatality

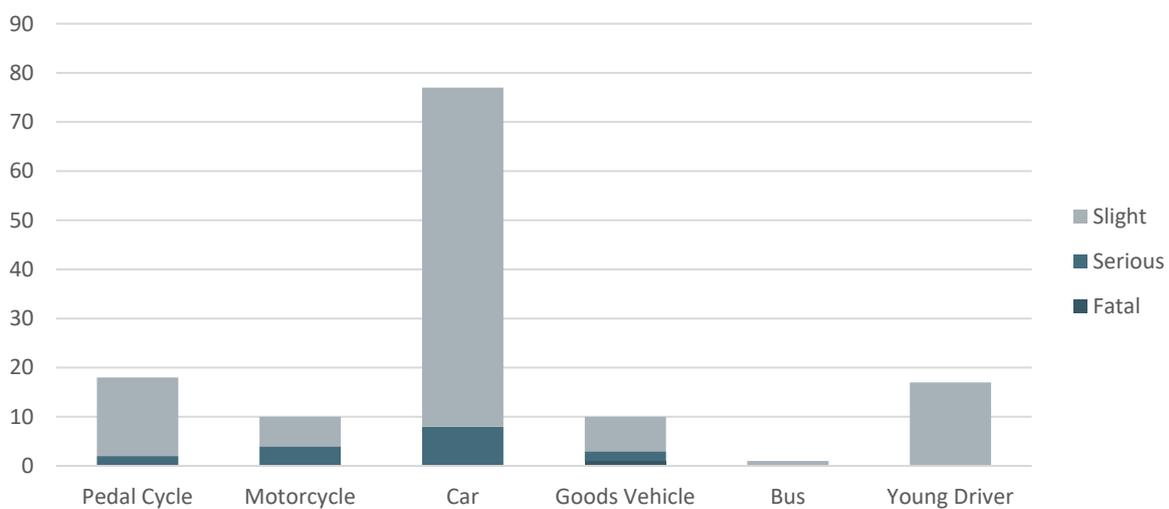


Figure 38 – Collisions in section 2 2016 to 2020 by vehicle involved and severity

Collisions tend to occur during the morning and evening peaks. There are increases around 'lunch time', particularly on a Friday and early on Sunday afternoon and late in the evenings around 21:00.

	00:00	01:00	02:00	03:00	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
Monday		1						3		2	1	1	1	2			4	1	1	2	2	3		
Tuesday		1							1	2			2		1			1		1	1	2		
Wednesday									1	2		1	1			2			1			1	1	
Thursday								2	2	2	1		3		1	2	2	2	2	5				2
Friday							1	1	4	2			2	4		1	1	2	2	2	1	1		
Saturday			1				1			2	1		1				1	1	1	1		2		
Sunday	1	1						2						3	3							1	2	

Figure 39 – Number of collisions in section 2 2016 to 202 by day of week and hour of day

Vehicles

There were **221** vehicles involved in collisions between the junction with the A355 Farnham Road and the A412 Uxbridge Road roundabout junction.

Of these **161 (73%)** were cars, with next highest, Pedal Cycles **18 (8%)** and Goods Vehicles (under 3.5 tonnes) **14 (6%)**.

Combined, Motorcycles accounted for **10 (5%)** of vehicles involved, distributed evenly between engine sizes, except 125-500cc, with **1**.

There were **8** Taxis and **2** buses recorded as vehicle type.

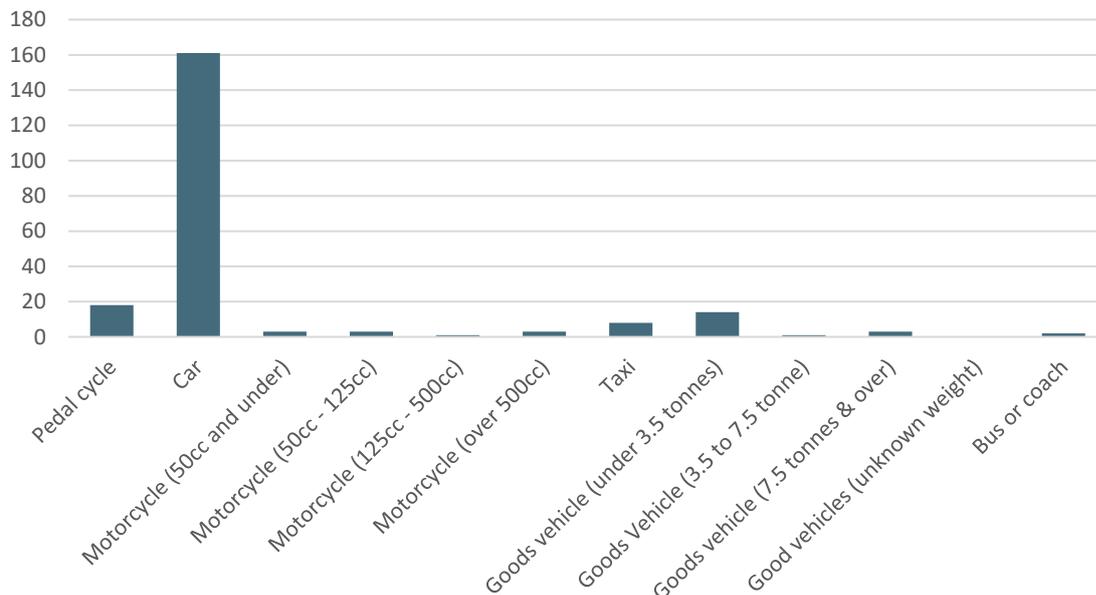


Figure 40 – Number of vehicles involved in section 2 2016 to 2020 by type

The majority of drivers were male **150 (68%)**, with **52 (24%)** female.

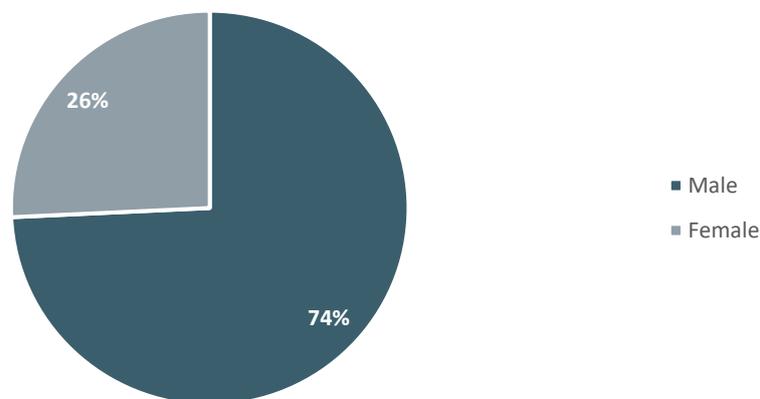


Figure 41 – Percentage breakdown of sex of driver in section 2

When looking at Driver Age, the highest numbers were for drivers from 26 to 55, with **54 (24%)** 26 & 35, **42 (19%)**, 36 & 45 and **32 (14%)** 46 & 55, with drivers 56 to 65 **12 (5%)**.

Younger drivers 21 to 25 accounted for **17 (8%)** and drivers 16-20 **9 (4%)** of all drivers. There were **2** drivers recorded between 11 & 15.

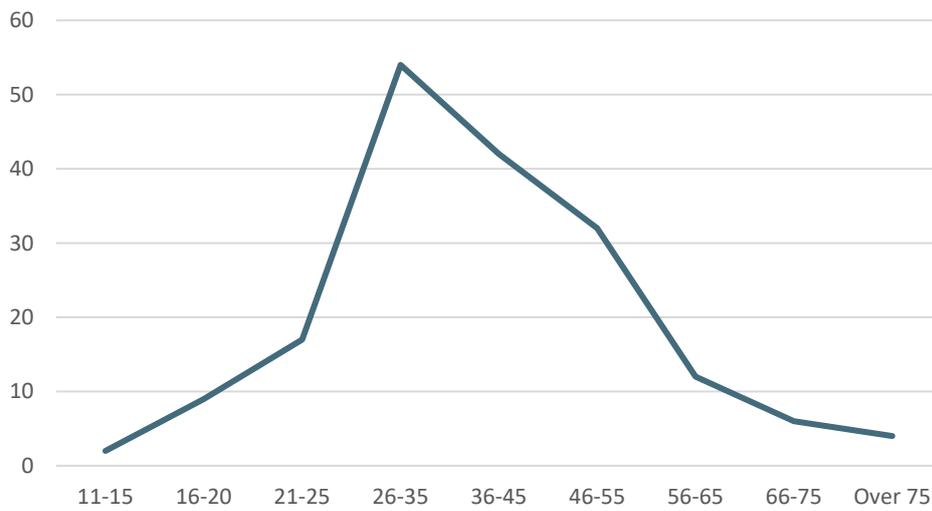


Figure 42 – Driver numbers in section 2 2016 to 2020 by age range

Of recorded Journey purpose, **51 (23%)** were recorded as other, **46 (21%)** were recorded as part of work and **19 (9%)** commuting to/from work. With only **4** recorded as relating to the school run.

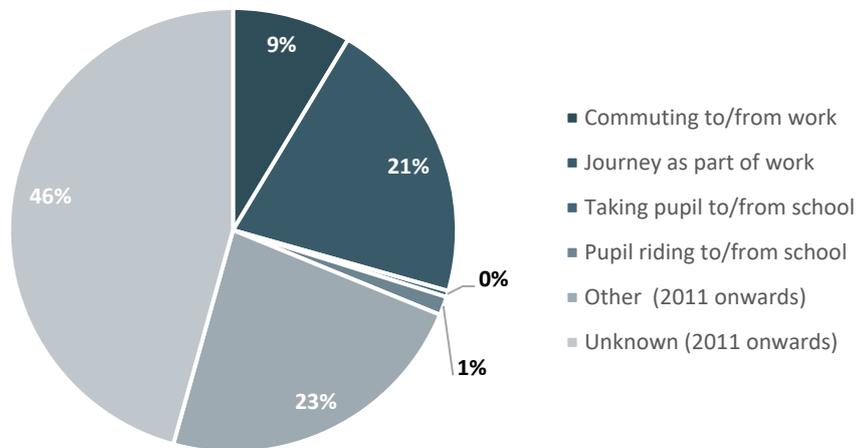


Figure 43 – Percentage of vehicles in section 2 2016 to 2020 by journey purpose

Casualties

Of the **122** recorded casualties between the junction with the A355 Farnham Road and the A412 Uxbridge Road roundabout junction, **88 (58%)** were male and **64 (42%)** were female.

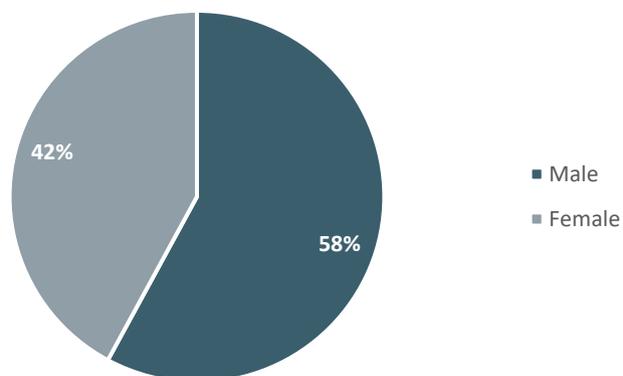


Figure 44 – Percentage of casualties in section 2 2016 to 2020 by sex

135 (89%) casualties were recorded as slight and **16 (11%)** serious, with **1** fatality.

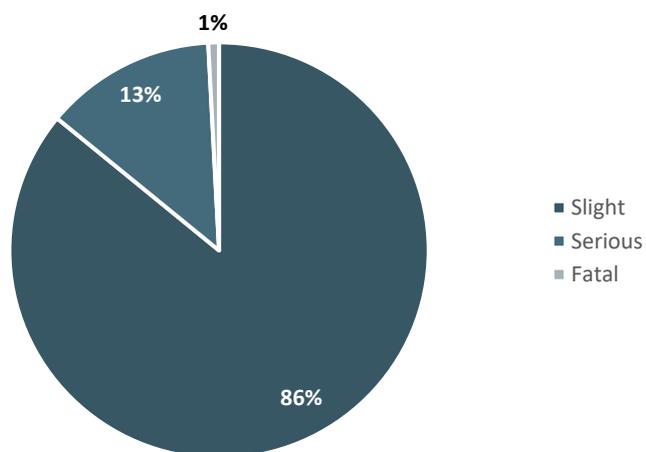


Figure 45 – Percentage of casualties in section 2 2016 to 2020 by severity

96 (63%) of casualties were the driver and **31 (20%)** a passenger, with **25 (16%)** recorded as a Pedestrian. Of the **96 Driver** casualties, **28 (29%)** were a VRU casualty (**18 Pedal Cyclist** and **10 Motorcyclist**).

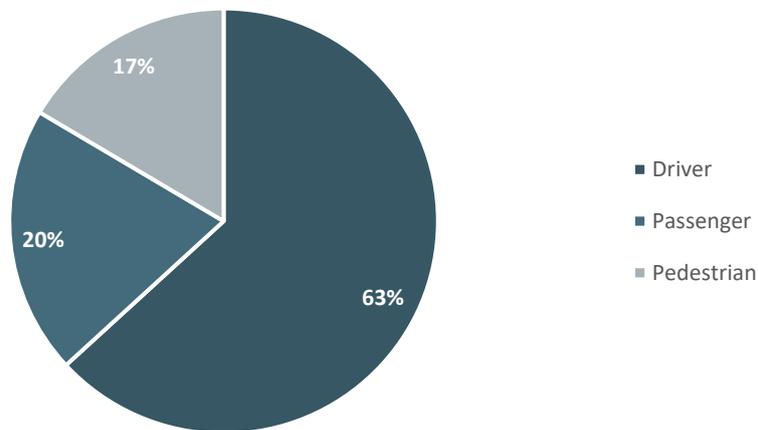


Figure 46 – Percentage of casualties in section 2 2016 to 2020 by class

When looking at age, casualties largely follow the vehicle involved with the majority of casualties between 26 and 55 years of age. **49 (32%)** were 26 to 35, **32 (21%)** 36 to 45 and **15 (10%)** 46 to 55. This was followed by younger drivers, with **13 (9%)** 21 to 25 and **13 (9%)** 16 to 20.

There were **8 (5%)** child casualties, **4** 11-15, **4** 6-10 and **3** 0-5.

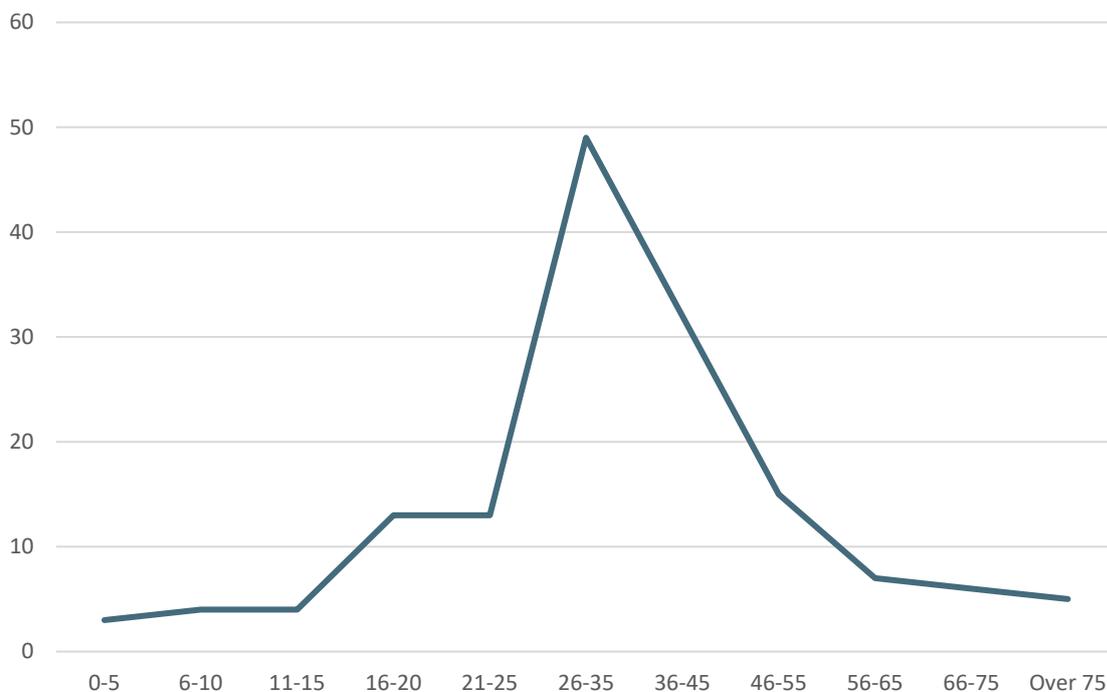


Figure 47 – Breakdown of casualties in section 2 by age band

Of the **25** pedestrian casualties, those at a crossing were the most common casualty with **19 (76%)**.

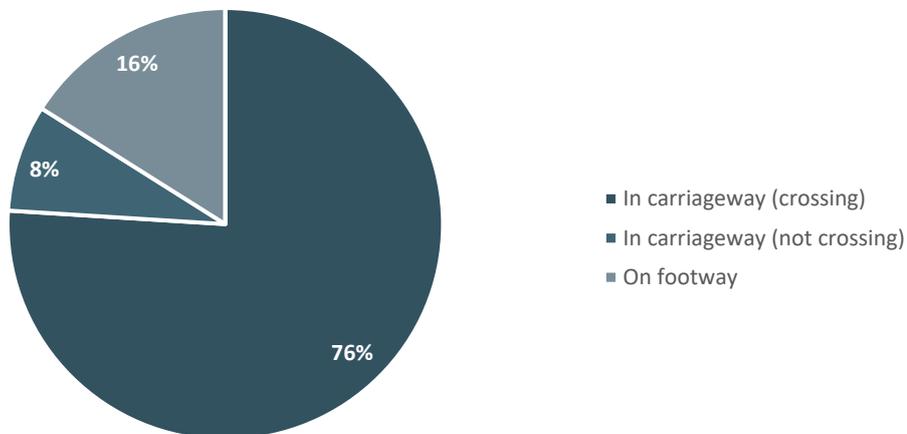


Figure 48 – Percentage of pedestrian casualties in section 2 2016 to 2020 by location

17 (68%) pedestrians were in the act of crossing the road.

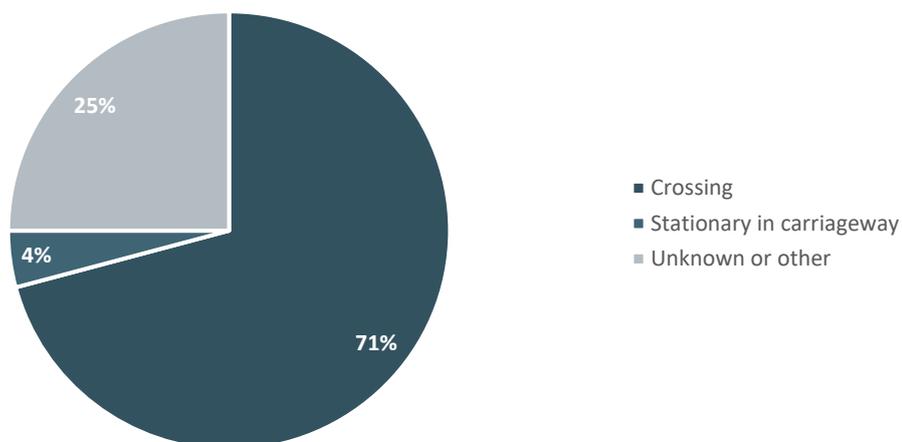


Figure 49 – Percentage of pedestrian casualties in section 2 2016 to 2020 by movement

Contributory Factors

The most common Contributory Factor (CF) for drivers was '405 – Driver Failed to Look Properly' of which **53** were recorded, **32** of these were recorded as Contributory Factor 1.

The second most common CF was '602 – Careless, Reckless or in a Hurry' with **26** recorded, with a similar number **23** recording of '406 – Failed to Judge Other Persons Path or Speed'. '403 – Poor turn or manoeuvre' was recorded **11** times.

'301 – Disobeyed and Automatic Traffic Signal' was recorded **13** times. **5** of these were recorded as Contributory Factor 1 and '306 – Exceeding Speed Limit was recorded **7** times, with '308 – Following to Close' recorded **5** times

Of CFs attributed to Pedestrians, the most common were recorded as '802 – Failed to Look Properly' with 7, and '808 – Careless, Reckless or in a Hurry' with 6.

There were 3 instances of both '803 – Failed to judge vehicles path or speed' and '804 – Wrong use of pedestrian crossing facility'.

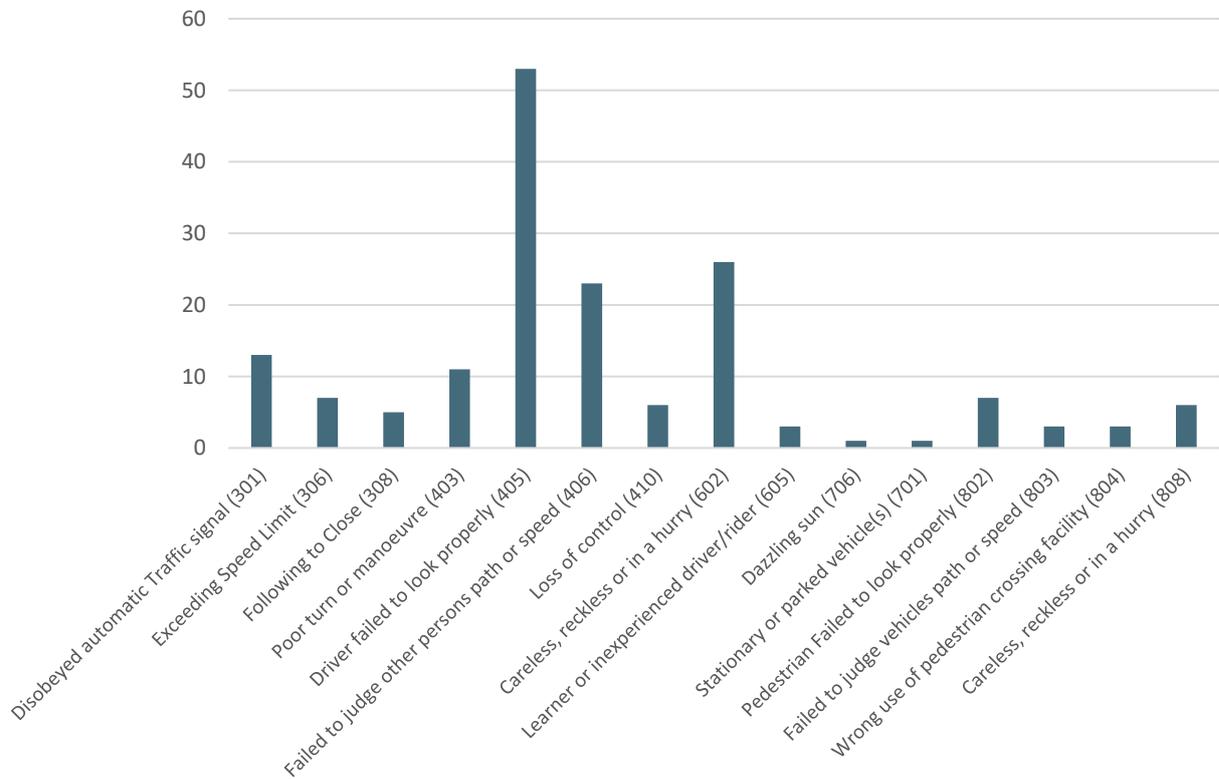


Figure 50 – Breakdown of collisions in section 2 2016 to 2020 by Contributory Factor

Section Three – A355 Uxbridge Road to M4 Junction 5 Roundabout.

Section Three runs from the roundabout with the A412 Uxbridge Road to the Entry/Exit of the roundabout of the M4 Junction 5.

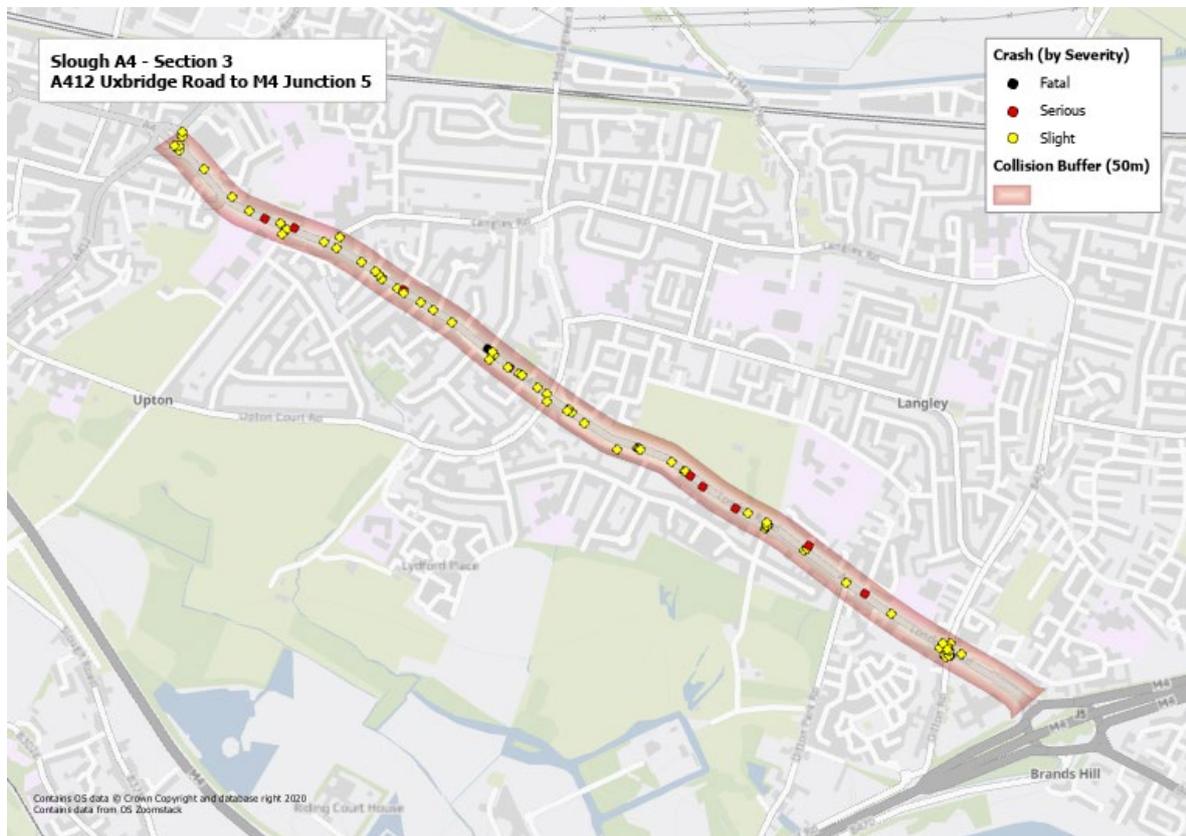


Figure 51 – Map of Section 3: A412 Uxbridge Road to the Entry/Exit M4 Junction 5 roundabout

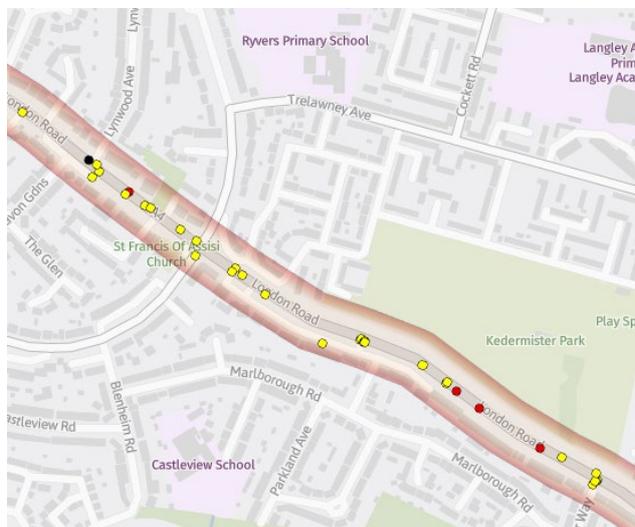
Section Three is approximately 3.2km in length with a speed limit of 30mph changing to 40mph at Langley Fire Station.

There were a total of 88 crashes, involving 165 vehicles, resulting in 124 casualties.



Looking at the collisions spatially, there were **10** collisions within 50m of the Junction of the A412 Uxbridge Road otherwise collisions are spread out along the road.

Figure 52 – Map of part of Section 2: A412 Uxbridge Road to Glenavon Gardens



There is a cluster of **4** collisions around Lynwood Road including **1** fatality. There are clusters of **5** collisions around the junctions of Cedar Way and London Road accesses to the Castleview residential area, otherwise collisions tend to be distributed along the road.

Figure 53 – Map of part of Section 2: Lynwood Road to Cedar Way



There is a small cluster of Collisions at the junction of Tobermory Close and a large cluster of **15** collisions at the junction with Ditton Road / B470. Langley High Street, which includes **1** fatality.

Figure 54 – Map of part of Section 2: Ditton Park Road to M4 Junction 5 roundabout

Crashes

Of the 88 crashes between the roundabout with the A412 Uxbridge Road to the Entry/Exit of the roundabout of the M4 Junction 5., 75 were recorded as slight, 11 serious and 2 fatal.

By Severity	
Slight	75
Serious	11
Fatal	2

Table 9 – Crashes by Severity in Section 3 2016 to 2020

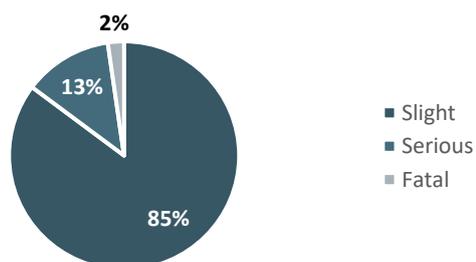


Figure 55 – Percentage of crashes by severity in section 3 2016 to 2020

Collisions changed little from **22** to **23** between 2016 and 2017, with 4 KSI dropping to **17** in 2018 and **16** in 2019. Collisions fell further to **10** in 2020.

Between 2016 and 2017 18% of collisions were KSI, dropping to 12% in 2019 and 10% in 2020. There was **1** fatality in 2016 and **1** in 2018

Year	Fatal	Serious	KSI	Slight	Total
2016	1	3	4	18	22
2017		4	4	19	23
2018	1	1	2	15	17
2019		2	2	14	16
2020		1	1	9	10

Table 10 – Collisions in section 1 by year and severity

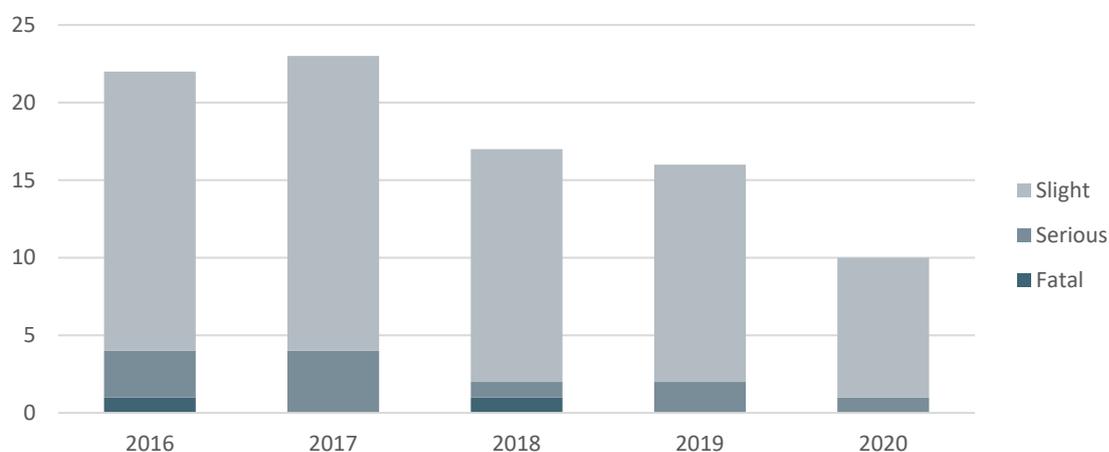


Figure 56 – Collisions in section 3 by year and severity

Collisions involving **2** Vehicles were highest, at **72 (82%)** followed by **9** single vehicle collisions (**10%**). There were **7** collisions recorded involving **3** vehicles.

Number of Vehicles	Fatal	Serious	KSI	Slight	Total
1	1	1	2	7	9
2	1	10	11	61	72
3				7	7
4					
5+					

Table 11 – Collisions 2016 to 2020 by number of vehicles involved

There were **67** collisions with a single casualty (**76%**), of these **11** were KSI, and **1** was fatal.

Number of Casualties	Fatal	Serious	KSI	Slight	Total
1	1	10	11	56	67
2		1	1	13	14
3	1		1	2	3
4				3	3
5+				1	1

Table 12 – Collisions 2016 to 2020 by number of resulting casualties

The majority of collisions, **80 (88%)** occurred in fine weather, of the remaining, **6 (7%)** occurred in the rain and **1** when it was Snowing.

64 (73%) collisions occurred when the roads were dry and of the remaining **24**, **22 (25%)** occurred on damp or wet roads and **2** in Snow, Frost or Ice.

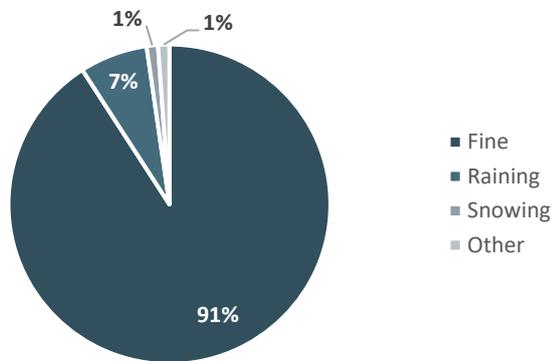


Figure 57 – Percentage of collisions 2016 to 2020 by weather conditions

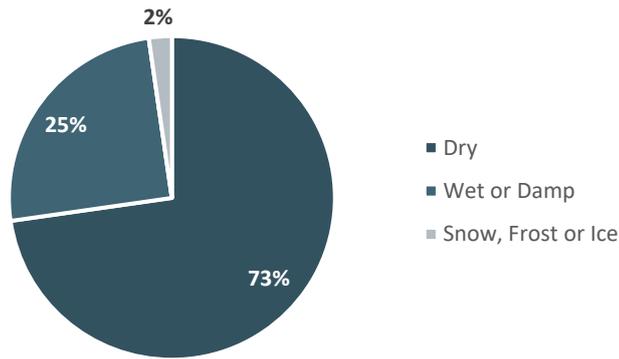


Figure 58 – Percentage of collisions in section 3 2016 to 2020 by road surface conditions

Of the **13** KSI collisions, **11** were recorded as fine weather with only **2** in the rain, with **8** of the KSI collisions occurring on dry roads. **66 (75%)** collisions occurred in Daylight, and of the **22** in Darkness, all were recorded as ‘Darkness (lights lit)’.

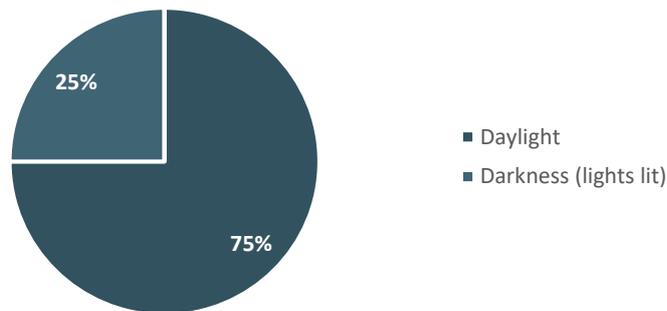


Figure 59 – Percentage of collisions in section 3 2016 to 2020 by lighting conditions

Of all collisions, **63 (72%)** occurred at junctions, **37 (42%)** at a T-Junction, **16 (18%)** at crossroads and **10 (11%)** at a roundabout. **16 (18%)** did not occur at a junction, **9 (10%)** occurred at a private.

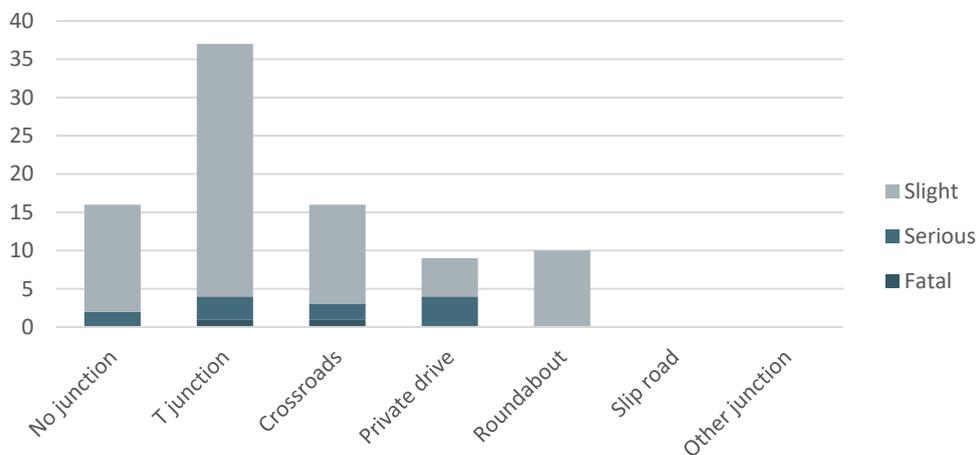


Figure 60 – Collisions in section 3 2016 to 2020 by junction detail

31 (35%) of collisions were recorded at a signal crossing, the majority, **57 (65%)** did not occur at a crossing.

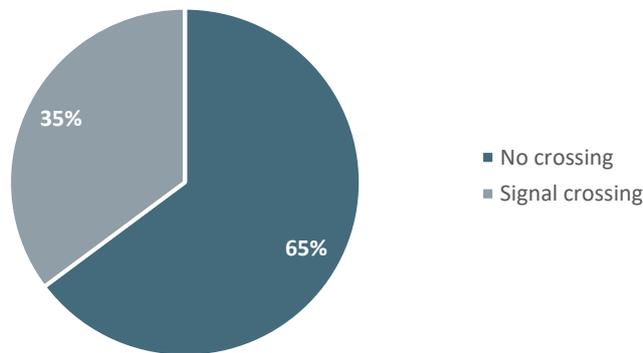


Figure 61 – Percentage of collisions in section 3 2016 to 2020 by pedestrian crossing

The highest number of VRU Casualties were Pedal Cyclists, **21**, of those, **2 (10%)** were KSI. This was followed by Motorcycle **11**, with **5 (45%)** KSI casualty. There were **8** Pedestrians casualties, of which, **2 (25%)** were KSI. There were **11** child casualties, with no recorded KSI.

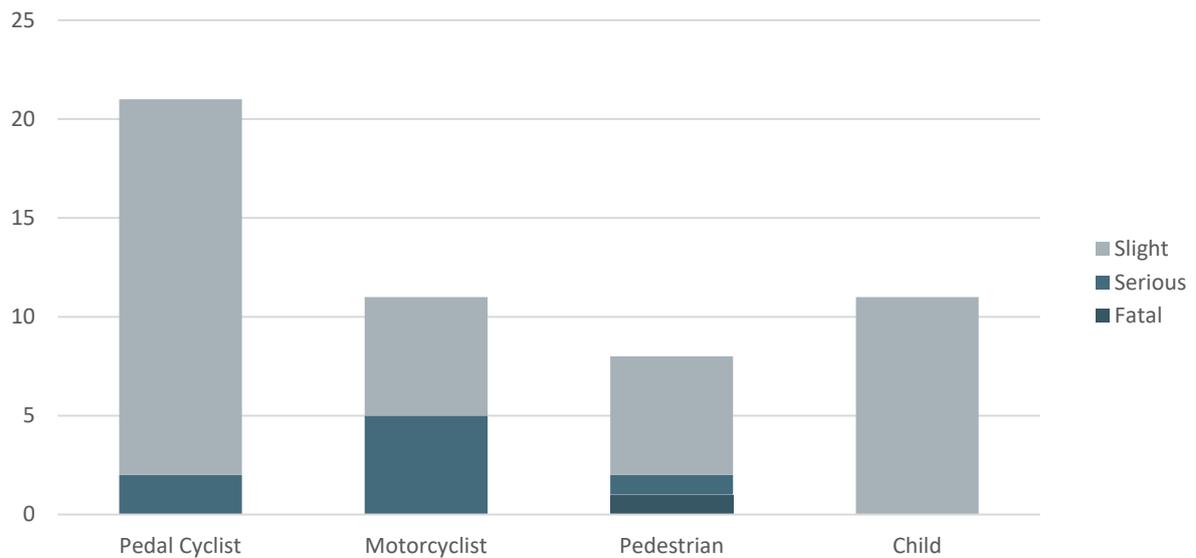


Figure 62 – Collisions in section 3 2016 to 2020 involving Vulnerable Road Users (VRU) by VRU type and severity

The highest number of collisions involved cars, **46**, this included **4 (9%)** KSI collisions, with **1** fatality. There were **15** collisions involving a young driver, **1 (7%)** of these was a KSI.

Pedal Cyclists were involved in **21** collisions, with **2 (10%)** KSI casualties. Of the **11** collisions involving a motorcycle **5 (45%)** were KSI collisions.

There were **4** collision involving Goods Vehicles, there was **1 (25%)** KSI, which resulted in a fatality

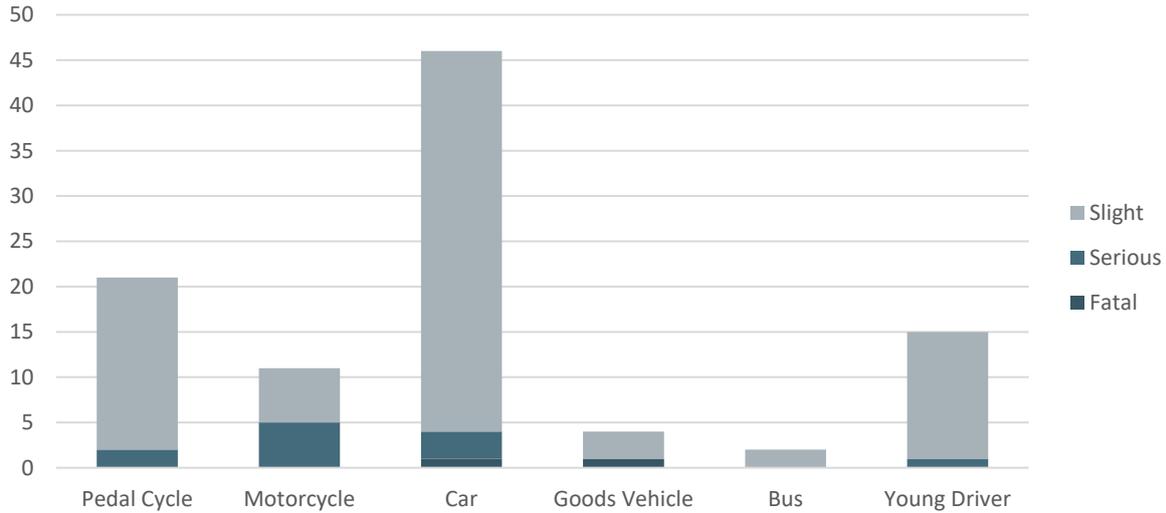


Figure 63 – Collisions in section 3 2016 to 2020 by vehicle involved and severity

Collisions tend to occur during the morning and the evening peaks, Monday to Friday. At weekends there is an increase around Noon and early evening on Saturdays.

	00:00	01:00	02:00	03:00	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
Monday								1	1	1			1		1	1		4		2		1		
Tuesday								1		1			1	1			2	4	1	1				2
Wednesday								1	1		1		1		1	2	1	1	3	1	1	2	1	
Thursday								2	1								3	2	1	2				
Friday	1							2	2				1	1		2		2		1	1	1		
Saturday											2	1	2			2	1	2	2	1				1
Sunday												2	2			1								

Figure 64 – Number of collisions in section 3 2016 to 202 by day of week and hour of day

Vehicles

There were **165** vehicles involved in collisions between the roundabout with the A412 Uxbridge Road to the Entry/Exit of the roundabout of the M4 Junction 5.

Of these **114 (69%)** were cars, with next highest, Pedal Cycles **21 (13%)** and Goods Vehicles (under 3.5 tonnes) **9 (5%)**.

Combined, Motorcycles accounted for **11 (7%)** of vehicles involved, **3** were '50cc and Under', **3** were '50cc to 125cc' and **5** were 'over 500cc'.

There were **4** Taxis and **3** buses recorded as vehicle type.

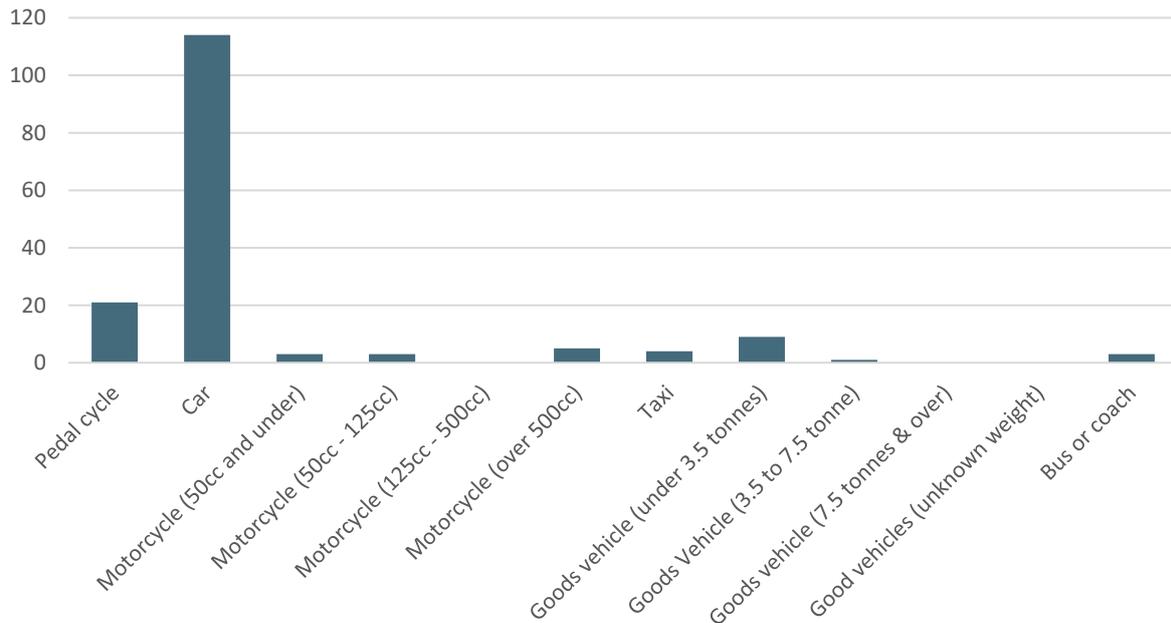


Figure 65 – Number of vehicles involved in section 3 2016 to 2020 by type

The majority of drivers were male **111 (67%)**, with **38 (23%)** female.

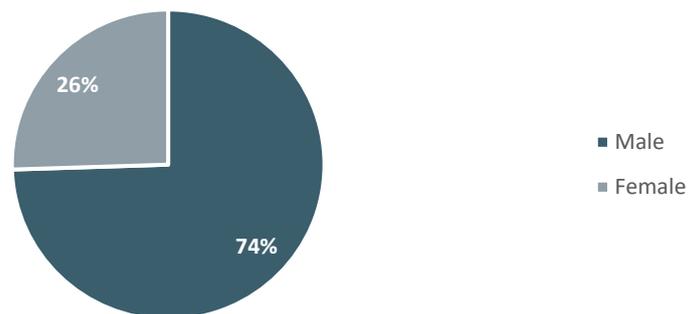


Figure 66 – Percentage breakdown of sex of driver in section 3

When looking at Driver Age, the highest numbers were for drivers from 26 to 45, with **36 (29%)** 26 & 35 and **26 (21%)**, 36 & 45. Followed by drivers 46 & 55 and 56 to 55 with **20 (16%)** each.

Younger drivers 21 to 25 accounted for **18 (15%)** and drivers 16-20 **6 (5%)** of all drivers. There were **3** drivers recorded between 11 & 15.

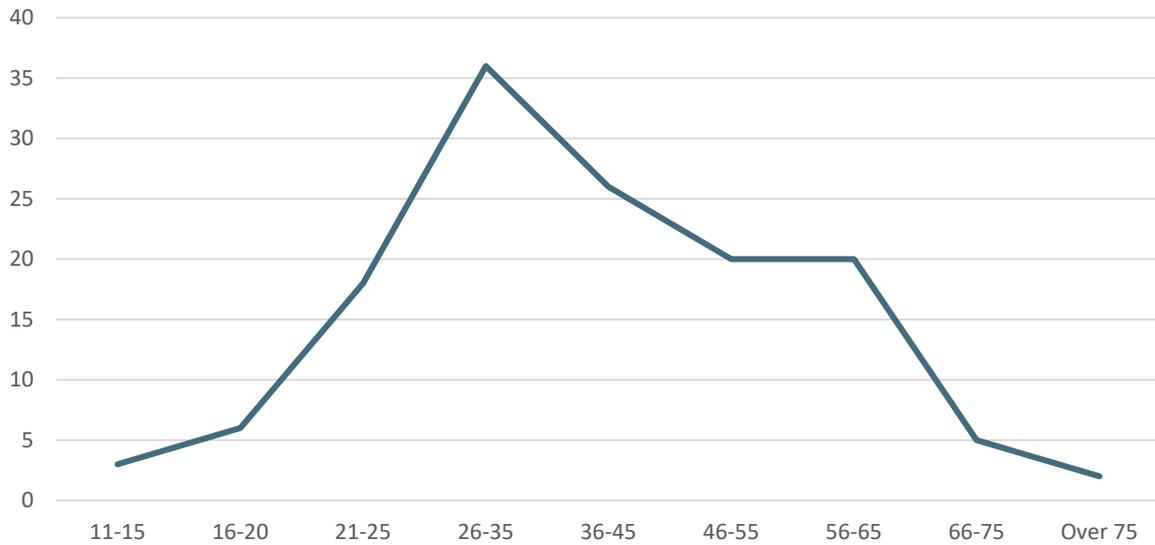


Figure 67 – Driver numbers in section 3 2016 to 2020 by age range

Of recorded Journey purpose, **45 (27%)** were recorded as other, **27 (16%)** were recorded as commuting to/from work and **21 (13%)** as part of work. With only **2** recorded as relating to the school run.

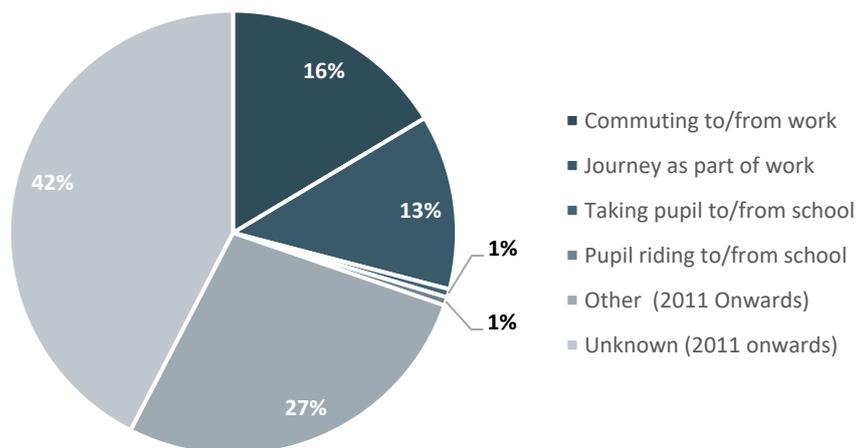


Figure 68 – Percentage of vehicles in section 3 2016 to 2020 by journey purpose

Casualties

Of the **124** recorded casualties, **80 (65%)** were male and **44 (35%)** were female.

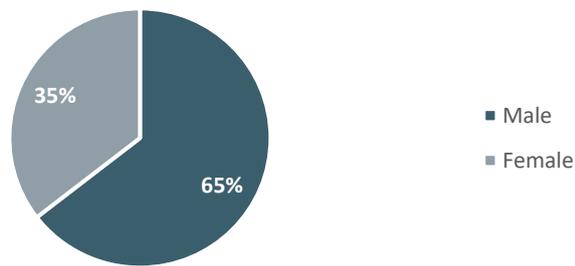


Figure 69 – Percentage of casualties in section 3 2016 to 2020 by sex

109 (88%) casualties were recorded as slight, **13 (11%)** as serious, and **2** fatalities.

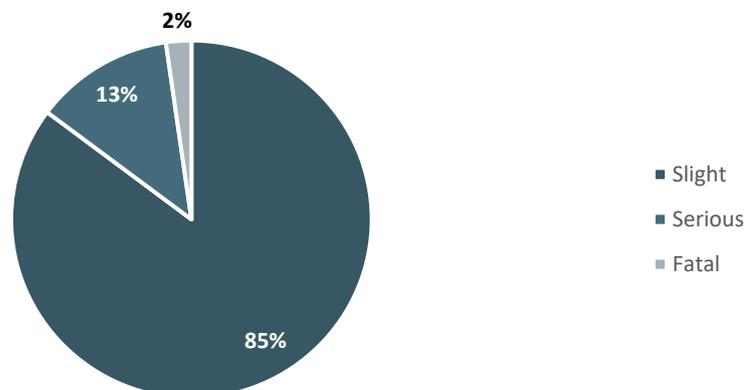


Figure 70 – Percentage of casualties in section 3 2016 to 2020 by severity

83 (67%) of casualties were the driver and **31 (25%)** a passenger, with **10 (8%)** recorded as a pedestrian. Of the **83** Driver casualties, **31 (37%)** were a VRU casualty (**21** Pedal Cyclist and **11** Motorcyclist).

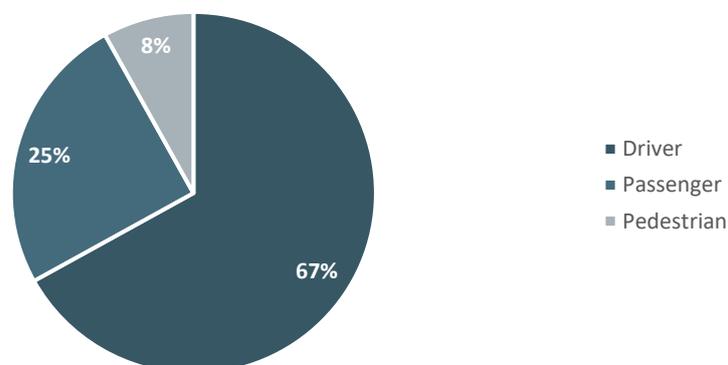


Figure 71 – Percentage of casualties in section 3 2016 to 2020 by class

When looking at age, casualties largely follow the vehicle involved with the majority of casualties between 26 and 45 years of age. **27 (22%)** were 26 to 35, **18 (15%)** 36 to 45. Followed by those 46-55 and 56-65, both with **16 (13%)** 46 to 55. This was followed by younger drivers, with **13 (10%)** 21 to 25 and **11 (9%)** 16 to 20.

There were **13 (10%)** child casualties, **7** 11-15, **3** 6-10 and **3** 0-5

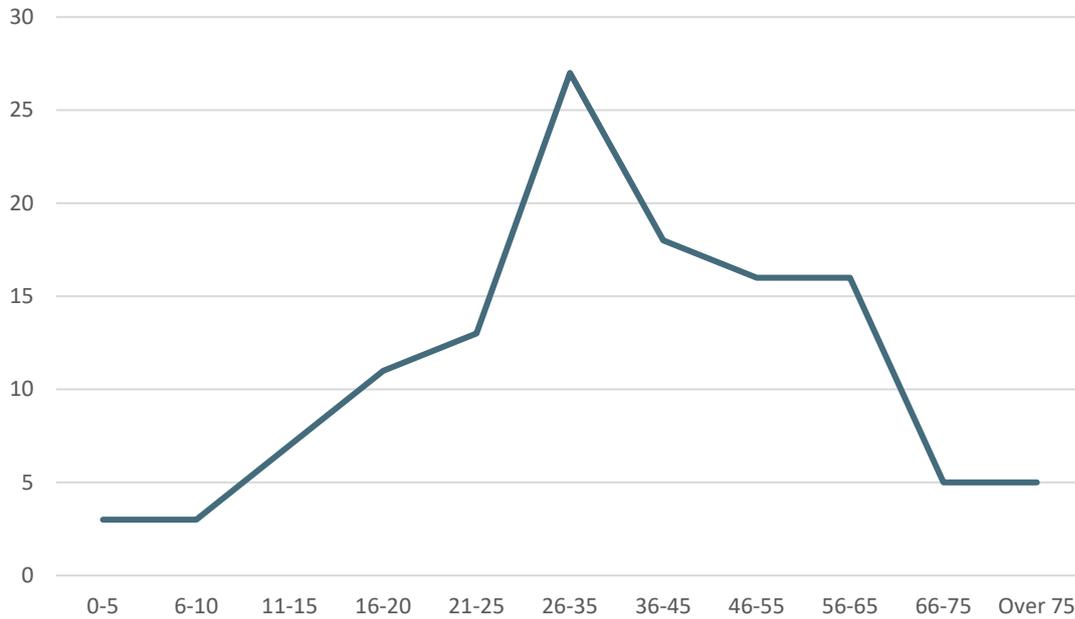


Figure 72 – Breakdown of casualties in section 3 by age band

Of the **10** pedestrian casualties, all were recorded as being at a crossing.

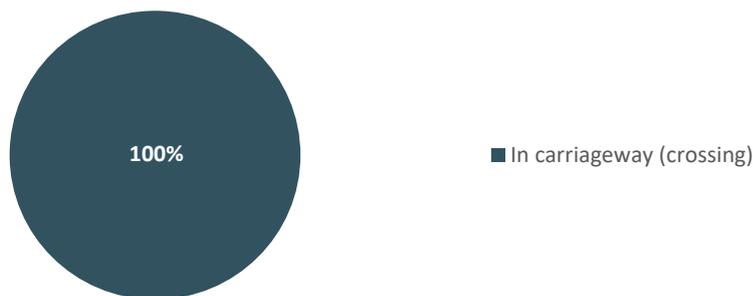


Figure 73 – Percentage of pedestrian casualties in section 3 2016 to 2020 by location

8 (80%) pedestrians were in the act of crossing the road.

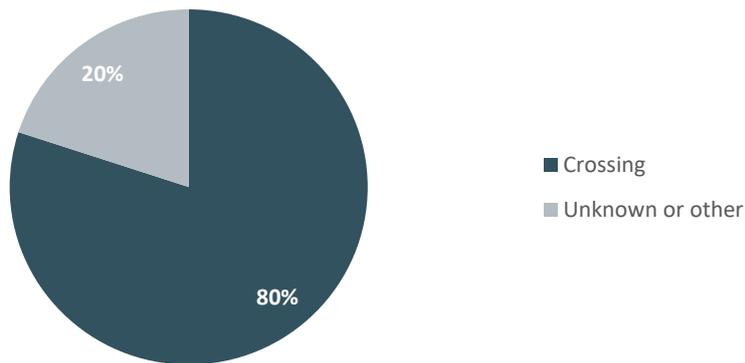


Figure 74 – Percentage of pedestrian casualties in section 3 2016 to 2020 by movement

Contributory Factors

The most common Contributory Factor (CF) for drivers was ‘405 – Driver Failed to Look Properly’ of which **42** were recorded, **20** of these were recorded as Contributory Factor 1.

The second most common CF was ‘406 – Failed to Judge Other Persons Path or Speed’ with **15** recorded, with a similar number **14** recording of ‘602 – Careless, Reckless or in a Hurry’. ‘301 – Disobeyed automatic Traffic signal’ was recorded **13** times. ‘706 – Dazzling Sun’ was recorded **5** times.

Of CFs attributed to Pedestrians, the most common were recorded as ‘803 – Failed to judge vehicles path or speed’ with **7**, and ‘802 – Failed to Look Properly’ with **5**.

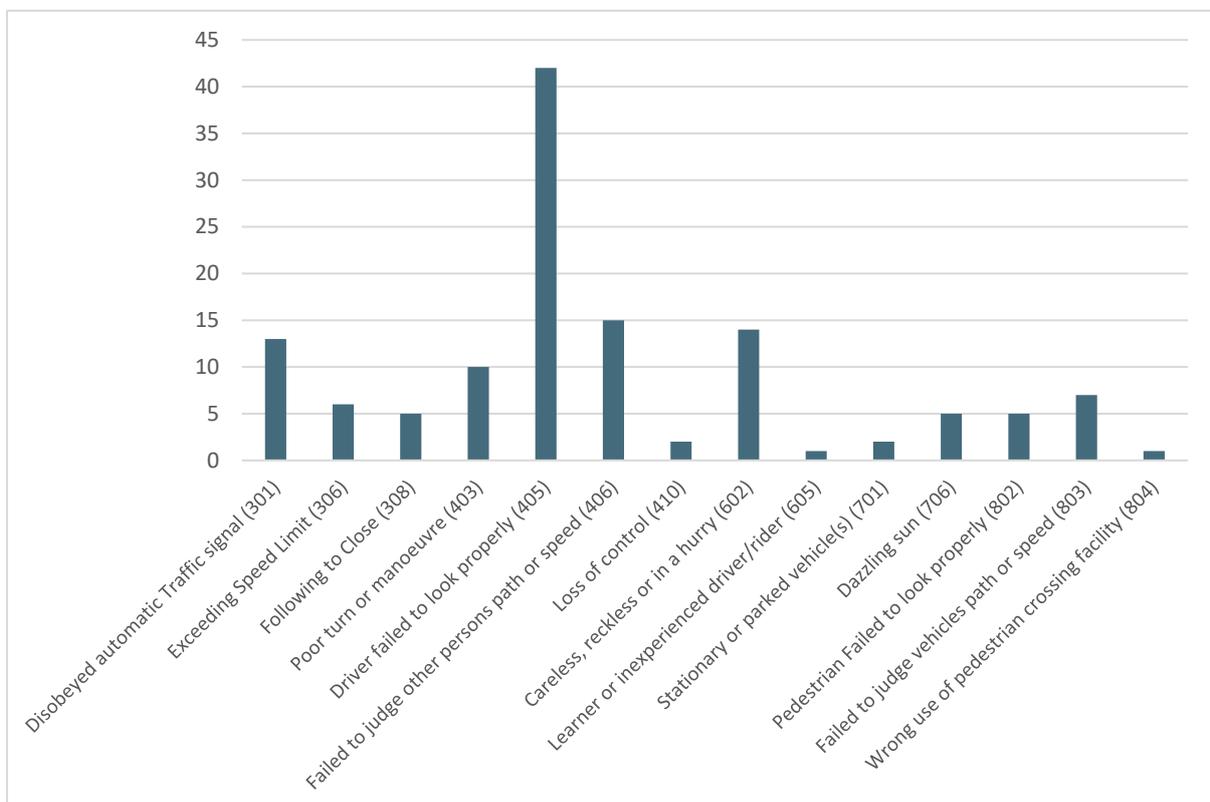


Figure 75 – Breakdown of collisions in section 3 2016 to 2020 by Contributory Factor

ROAD DANGER ASSESSMENT – IRAP APPROACH

iRAP has developed five globally-consistent protocols to assess and improve the safety of roads by building on the work of Road Assessment Programmes (RAP) in high-income countries. This is a well-recognised and highly regarded process for assessing roads risk, and helping to identify which improvements will achieve the highest improvements to safety given a certain budget.

The iRAP Protocols:

1. Crash Risk Mapping uses detailed crash data to illustrate the distribution of recorded fatalities and serious injuries on a road network.
2. Star Ratings provide a simple and objective measure of the level of safety provided by a road's design.
3. Fatality Estimation Mapping illustrates the distribution of the expected number of fatalities and serious injuries across a road network.
4. Safer Road Investment Plans (SRIP) draw on approximately 90 proven road improvement options to generate affordable and economically sound infrastructure options for saving lives.
5. Performance Tracking enables the use of Star Ratings and Crash Risk Mapping to track road safety performance and establish policy positions

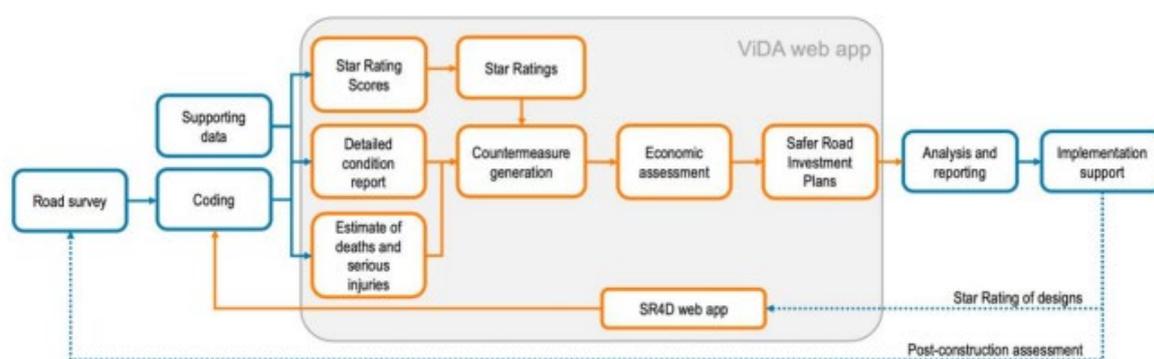


Figure 76 – iRAP Process

Road attribute coding is the heart of an iRAP project. The purpose of road attribute coding is to use georeferenced images collected during a survey or road designs to record road attributes for each 100m segment of road. This coding data is then combined with other supporting data and uploaded in ViDA to produce Star Ratings, Safer Roads Investment Plans and, ultimately promote the implementation of road safety countermeasures that can save lives. This manual describes the coding process and defines the road attributes that must be recorded. Throughout the manual, the following symbols are used to highlight key issues or provide additional information.

PROCESS

The original data provided in the bid to the DfT is now out of date with more current data from STATS19 and know changes to the A4 such of the use of the bus lanes by cyclists and the likelihood of degradation to the road surface, or repairs areas which previously would have been flagged.

New data needed to be collected for the IRAP process, which meant recording a new video with integrated GPS data along this stretch of the A4. The video was recorded on 23rd August 2021 between 1pm and 3pm and was collected by attaching a portable camera to the front of a car which would drive in both directions along the full stretch of the A4.



Figure 77 – Image1 from video footage of the A4

The video recording was then provided to a third party organisation FPZ to code this data following the IRAP process. Still images are extracted from the video at 100m segments for the entire length of the road, and are repeated where the road has segregation between the lanes. Each of these images is then coded according to the IRAP coding manual which includes 90 different criteria for each segment. Recording things such as road condition, pavement width and adjoining land use (i.e.: residential, business, undeveloped) to name but a few.

The final data required at this stage in the process is to include vehicle speed and flow data. Agilysis has access to this data from Ordnance Survey and is already processed and included in some of our tools such as the Active Streets Assessment tool. This data is extracted for this length of road at each of the 100m segments and added to the coding file for each direction of travel. Note that the observed speeds of vehicles are banded into 5mph figures. However overall compliance along the A4 is within the existing speed limits.

Following the initial coding process by FPZ, it is then submitted to another organisation for quality assurance and a second opinion. For this project the QA process was provided by the Road Safety Foundation. They raised a couple of the queries on one of two of the segments, and these were amended in the final coding file.

Once the coding file is completed, it is then uploaded into the VIDA software for further calibration and processing in order for it to generate a risk profile. A copy of the raw coding can be found in appendix A.

CALLIBRATION

The calibration is the next step in providing context to the coding data so that it can produce some meaningful outputs. This is where the casualty information is added, including the costs associated with KSI's and countermeasures.

The casualty data was discussed earlier in this report, and advice was sought from the Road Safety Foundation as how best to accurately represent this information within the tool. The table below

summarises how casualties have been split between each of the road user groups during the calibration process.

User Group	Vehicle Occupant	Motorcyclist	Pedestrian	Bicyclist
Percentage of total KSI's	35%	5%	25%	35%

A further figure for the fatality estimation needs to be provided. Under advisement from RSF this was set at 3.53 in line with National figures given that there were 69 reported KSIs, and an under-reporting figure of 1. This calculates an estimated number of annual fatalities on the network of 0.706.

The iRAP research paper “the true cost of roads crashes” provides an estimation for value of life as determined by the Gross Domestic Product per capita of any given country, followed by a multiplier. The figure for value of life in the UK is £ 1,926,380 with a separate multiplier of 0.11 of this figure for serious injuries, giving a figure of £ 211,901.80. This figures are crucial in order to calculate the cost benefit ratio of any given scheme.

The final data included in the calibration is the costs associated with each of the different types of countermeasure. This includes different costs depending on whether the road is urban or rural, and whether the flow of traffic is low, medium, or high. It may well be that these costs increase or decrease on a local level or by service provider, however they are a good indicator as to the overall costs of any given scheme and what CBR it will deliver. A full list of countermeasures and the figures associated with them can be found in appendix b.

STAR RATINGS

iRAP Star Ratings are an objective measure of the likelihood of a road crash occurring and the severity of the crash outcome. Star Ratings are produced by identifying and recording the road attributes which influence the most common and severe types of crashes, based on scientific evidence-based research. In this way, the level of risk to an individual road user on a particular road section or network can be defined without the need for detailed crash data. Research shows that a person’s risk of death or serious injury is highest on a 1-Star road and lowest on a 5-Star road. Star Ratings are produced for vehicle occupants, motorcyclists, pedestrians and bicyclists.

A Star Rating Score (SRS) is calculated for each 100m segment of road for vehicles occupants, motorcyclists, pedestrians and bicyclists. The SRS—that is, the relative risk of death and serious injury for an individual road user—is calculated using the following equation:

$$\text{crash type score} \times \frac{\text{likelihood} \times \text{severity}}{\text{operating speed} \times \text{external flow influence}} \times \text{risk factors}$$

Motorised road user scores (vehicle occupants and motorcyclists) are based on head-on, run-off road and intersection crash types. Pedestrian scores are based on walking along- and across-the-road crash types. Bicyclist scores are based on riding along-the-road and intersections crash types. Risk factors

are associated with road attributes, which are recorded during the survey and coding part of the assessment, for different crash types.

Below are the star ratings split by different road user groups for the route. These are an assessment of the A4 as it is today.

SUMMARY

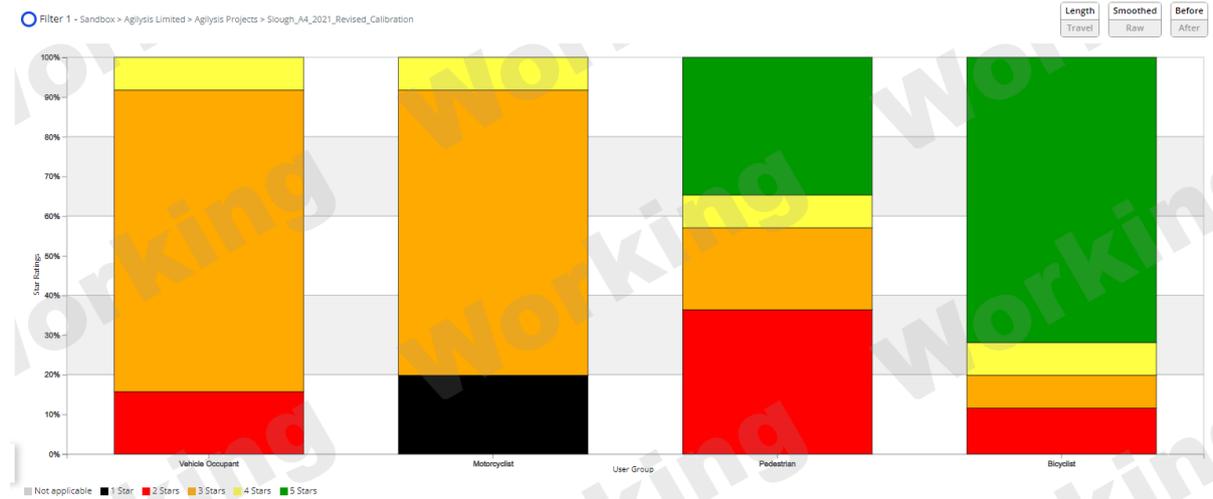


Figure 78 – Star Rating breakdown by road user group for entire length of A4

Vehicle users

Current star rating assessment map:

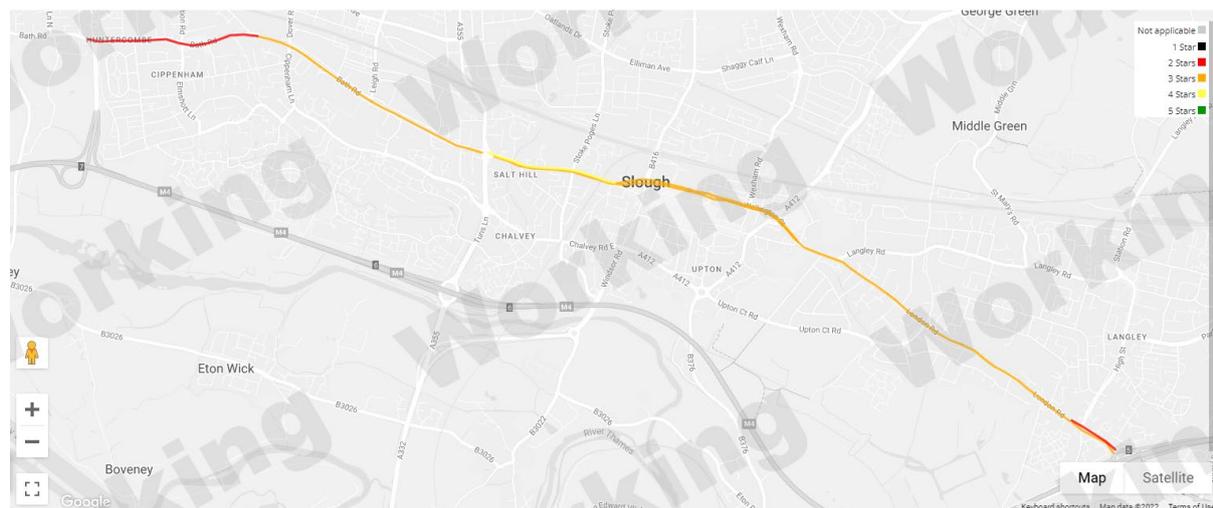


Figure 79 – Current Star Rating profile for Vehicle users

Star Rating	Percentage of Length of route
1 Star	-

2 Star	16%
3 Star	76%
4 Star	8%
5 Star	-

Motorcycles

Current star rating assessment map:

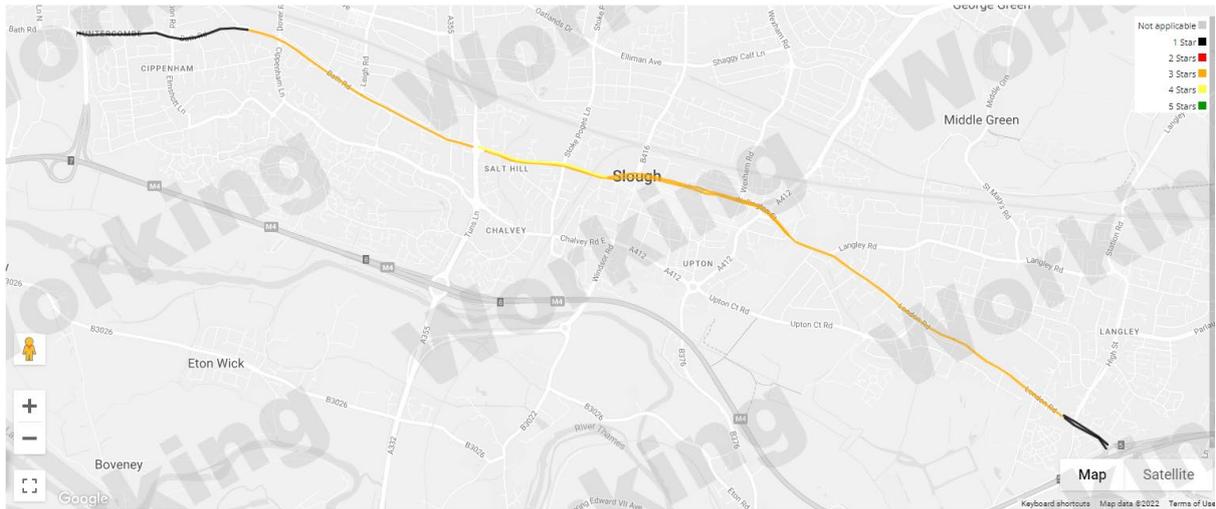


Figure 80 – Current Star Rating profile for Motorcycle users

Star Rating	Percentage of Length of route
1 Star	20%
2 Star	-
3 Star	72%
4 Star	8%
5 Star	-

Bicyclists

Current star rating assessment map:

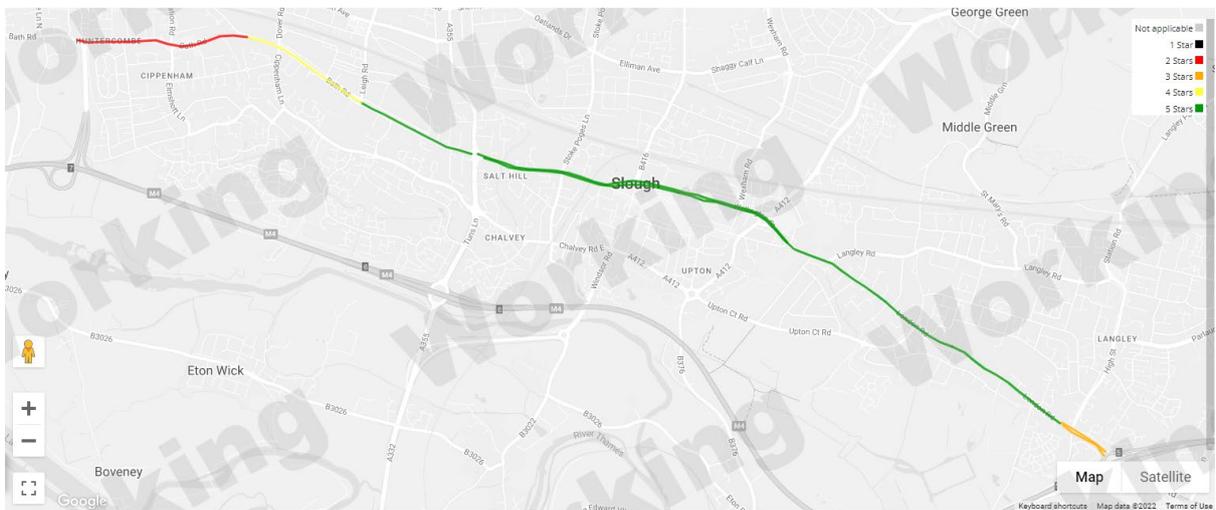


Figure 81 – Current Star Rating profile for Cyclists

Star Rating	Percentage of Length of route
1 Star	
2 Star	12%
3 Star	8%
4 Star	8%
5 Star	72%

Pedestrians

Current star rating assessment map:

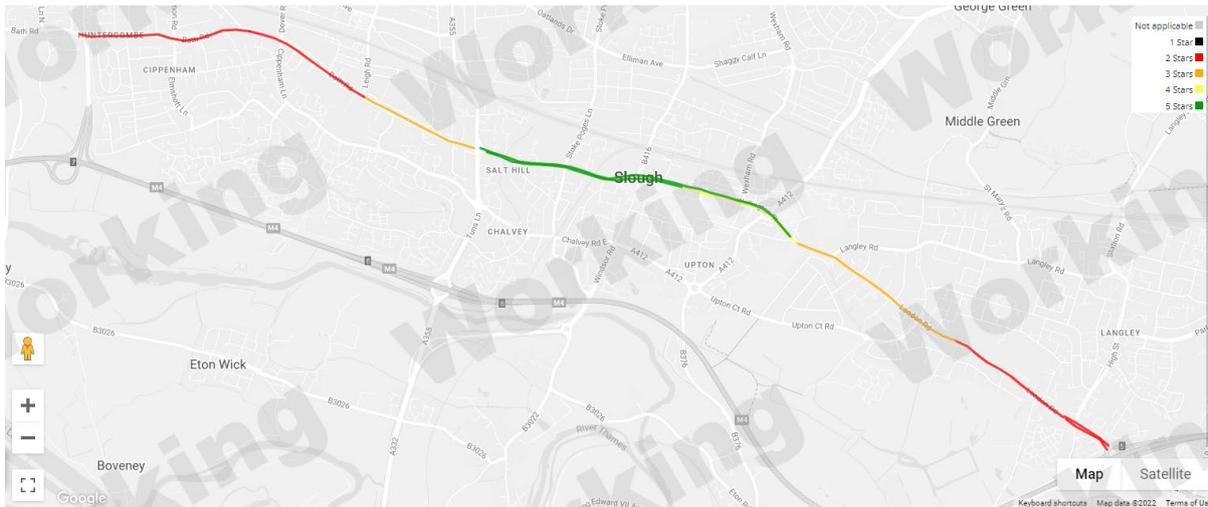


Figure 82 – Current Star Rating profile for Pedestrians

Star Rating	Percentage of Length of route
1 Star	-
2 Star	36%
3 Star	21%
4 Star	8%
5 Star	35%

SAFER ROADS INVESTMENT PLAN

An Investment Plan is a prioritised list of countermeasures (safety treatments) that can cost-effectively improve Star Ratings and reduce infrastructure-related risk. More than 90 road improvement options can be analysed by the iRAP model to generate affordable and economically sound investment that improve a road's Star Ratings and, when implemented, can save lives. Investment Plans are based on an economic analysis of a range of countermeasures, which is undertaken by comparing the cost of implementing the countermeasure with the reduction in crash costs that would result from its implementation. They contain extensive planning and engineering information such as road attribute records, countermeasure proposals and economic assessments for 100 metre segments of a road network.

Estimation of fatalities and serious injuries are used in Investment Plans to assess the benefits and costs of implementing infrastructure safety countermeasures on a road. FSI estimates are made for each 100m segment of the existing road under existing conditions.

SPEED LIMIT REDUCTION

The original proposal stated that the ambition was to extend the 30mph speed limit to the entire length of this route.

While this is not an option available through the VIDA software, a comparison set of coding has been created with the speed limits, and speed compliances altered to reflect these changes, while all other information has remained the same. It is from this that we are able to calculate the different in KSI estimation simply as a result of altering the speed limit and maintaining a compliance within 5mph of the posted limit.

Without knowing the costs associated with a change to the speed limit, we are unable to calculate a cost benefit ratio, however we anticipate that that costs for simple changing the limit would be low. We have also assumed that in the absence of any additional speed enforcement to areas where there has a speed limit reduction, that compliance would be within 5mph of the limit. Note that current compliance is within the existing speed limit of both the 30mph and 40mph sections.

A change in the speed limits where they are currently 40mph to 30mph would result in a **38 KSI** saving over a period of 20 years. The table below shows the adjustments in the star ratings for each road user group simply by changing the speed limit.

Star Rating	Vehicle Before	Vehicle After	Motorcycle Before	Motorcycle After	Pedestrians Before	Pedestrians After	Bicyclists Before	Bicyclists After
1 Star	-	-	20%	-	-	-	-	-
2 Stars	16%	12%	-	20%	36%	8%	12%	-
3 Stars	76%	80%	72%	72%	21%	49%	8%	20%
4 Stars	8%	8%	8%	8%	8%	8%	8%	-
5 Stars	-	-	-	-	35%	35%	72%	80%

ADDITIONAL COUNTERMEASURES

Following the assumed change in speed limit, VIDA will suggest a list of countermeasures or safety treatments in its Safer Roads investment plan. The costs and BCR is reliant on the information input during the calibration process, and are there to give an indication rather than an exact figure.

The investment plan will only identify countermeasures which deliver a cost benefit ratio of 2 or above. The table below outlines the suggested measures as well as the overall cost, KSI's saved and the CBR. The overall analysis period has been set to 20 years, and you will note that each countermeasure has a different lifespan. For example improving delineation will only have a life span of 5 years, and the output will recognise that this will need to be implemented 4 times across the 20 year analysis period.

Countermeasure	Length / Sites	FSIs saved	PV of safety benefit	Estimated Cost	Cost per FSI saved	Program BCR
Bicycle Lane (off-road)	0.30 km	2	£502,661	£55,355	£22,402	9
Bicycle Lane (on-road)	0.30 km	0.9	£179,745	£3,547	£4,014	51
Central hatching	2.90 km	3	£528,812	£38,605	£14,851	14
Centreline rumble strip / flexi-post	1.90 km	1	£226,393	£26,955	£24,221	8
Clear roadside hazards (bike lane)	0.90 km	2	£452,965	£182,515	£81,969	2
Clear roadside hazards - driver side	2.70 km	10	1,993,749	£513,677	£52,413	4
Clear roadside hazards - passenger side	1.50 km	5	1,083,246	£291,648	£54,771	4
Footpath provision driver side (>3m from road)	0.20 km	0.6	£116,395	£36,000	£62,919	3
Footpath provision driver side (adjacent to road)	0.50 km	0.8	£167,609	£76,939	£93,382	2
Footpath provision driver side (informal path >1m)	0.50 km	0.5	£102,585	£17,340	£34,387	6
Footpath provision passenger side (>3m from road)	0.20 km	0.6	£126,560	£36,000	£57,866	4
Parking improvements	0.40 km	0.2	£44,152	£5,532	£25,488	8
Pedestrian fencing	3.90 km	10	£ 2,129,899	£331,500	£31,662	6
Road surface rehabilitation	0.70 km	1	£292,887	£125,985	£87,505	2
Roadside barriers - driver side	0.70 km	4	£816,362	£203,000	£50,586	4
Roadside barriers - passenger side	0.70 km	3	£614,348	£203,000	£67,220	3
Side road signalised pedestrian crossing	2 sites	2	£409,968	£116,189	£57,654	4
Signalised crossing	20 sites	6	£1,229,591	£926,688	£153,316	1
Traffic calming	4.10 km	12	£2,339,683	£754,567	£65,608	3
Unsignalised raised crossing	14 sites	3	£650,738	£750,351	£234,571	1
		69	£ 14,008,349	£ 4,695,393	£68,187	3

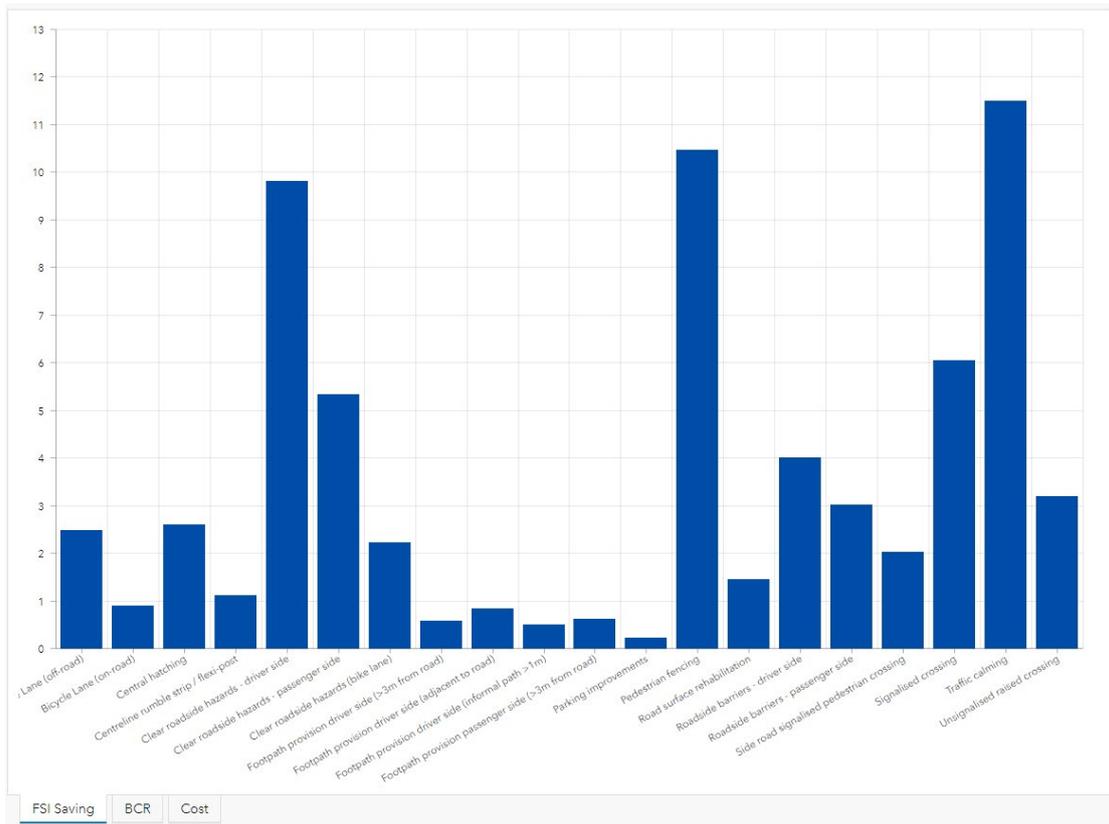


Figure 83 – Breakdown of FSI/KSI saved by each countermeasure suggested

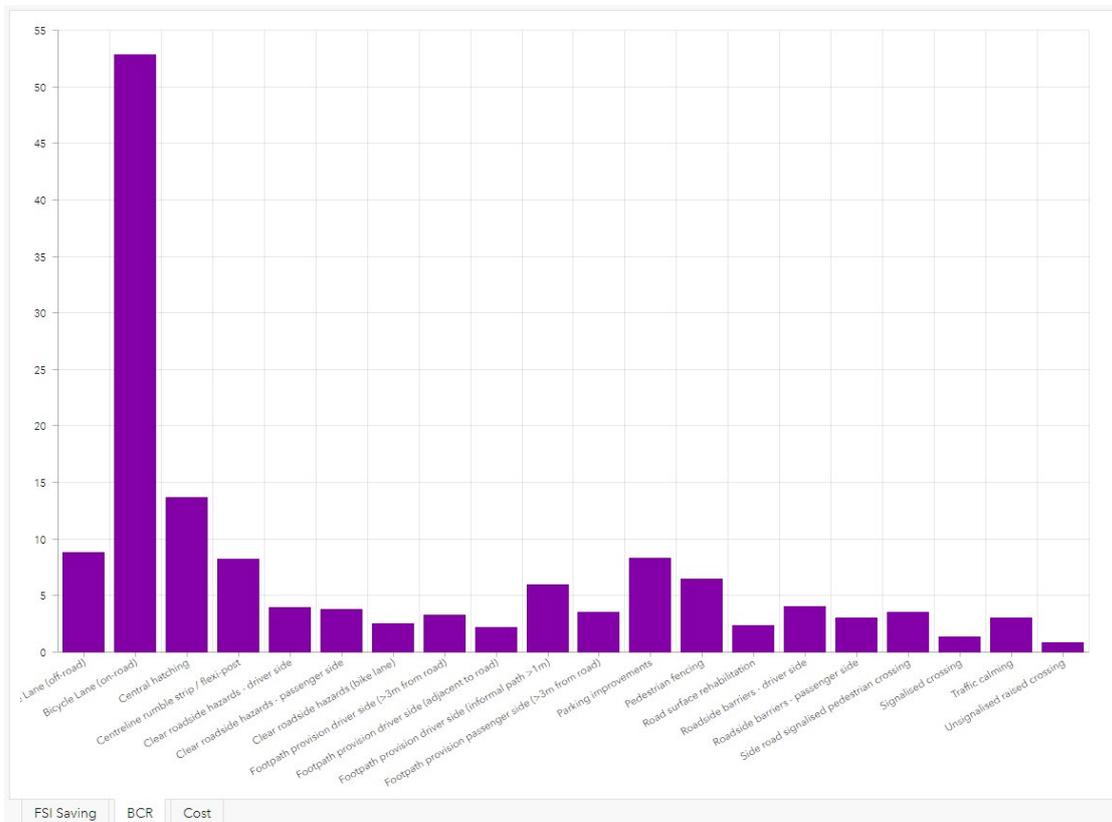


Figure 84 – Breakdown of BCR by each countermeasure suggested

Note that the original coding was made for every 100m section of the route, and therefore each countermeasure suggested will be limited by section. Therefore it may suggest that only 2 sections (200m) may require one type of measure, whereas others may be suggested over longer or shorter lengths. Additionally the BCR is calculated if that countermeasure was implemented across all of the suggested sections, however it is likely that some single sections may carry a higher BCR or KSI saving than others.

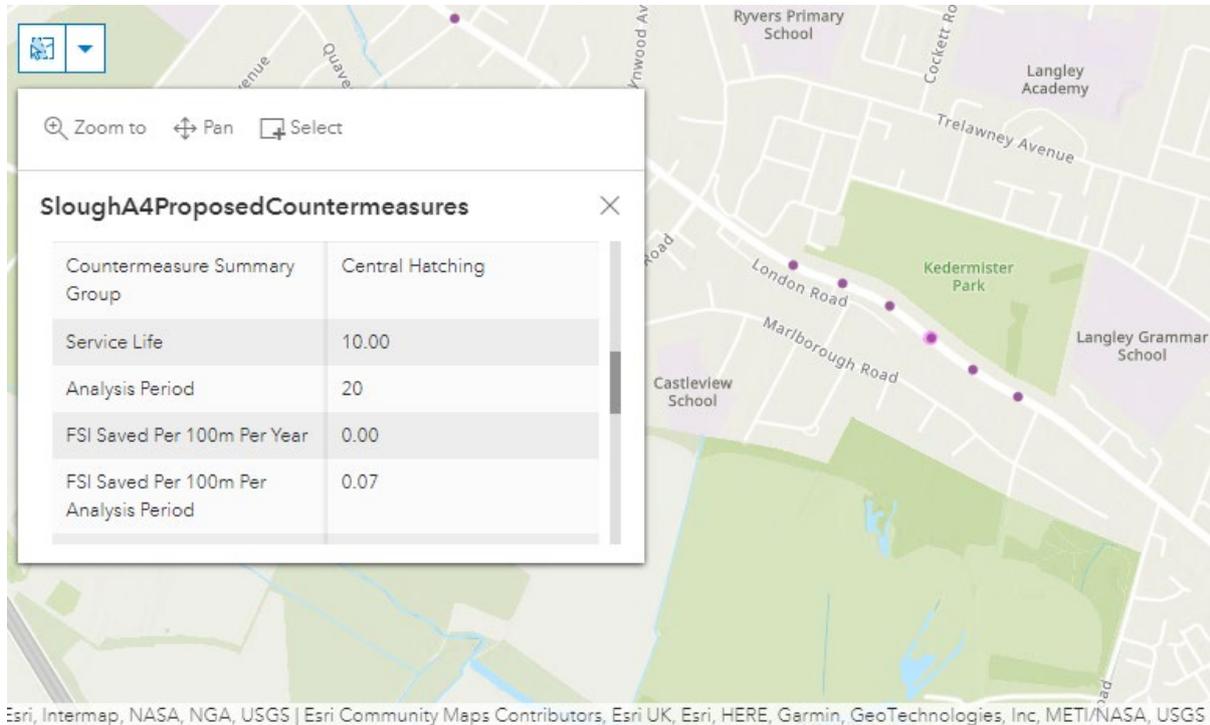


Figure 85 – Example of detail surrounding single countermeasure at single 100m location

To help interrogate this information by looking at individual sites for each countermeasure, we have put this data into an interactive dashboard which can be accessed here: [Countermeasures Dashboard](#)

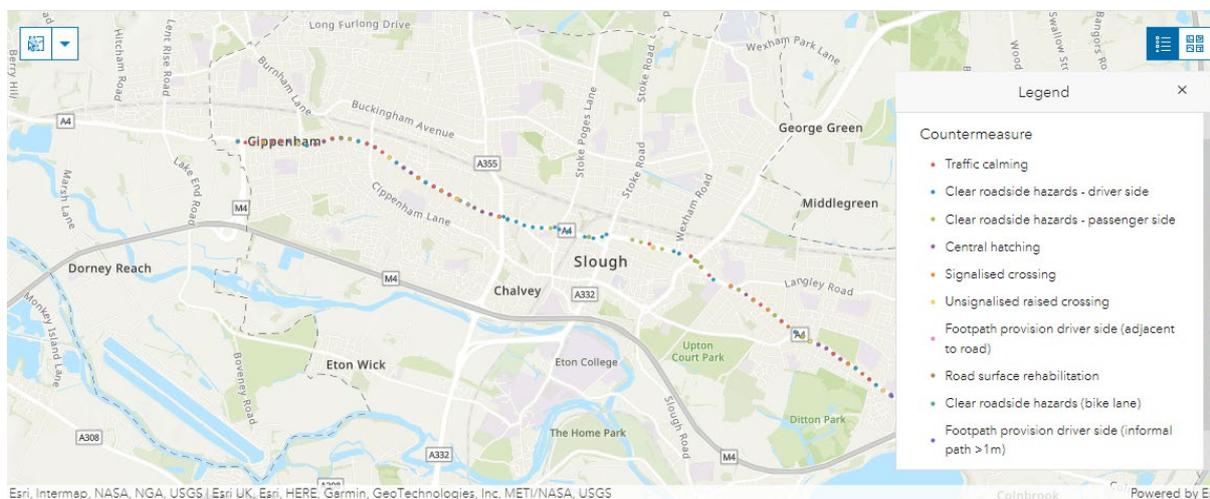


Figure 86 – View from the countermeasures dashboard

A further point of consideration is that these countermeasures are not necessarily prescriptive but rather point to areas of concern. A prime example of this is ‘traffic calming’, which is something that would be largely unsuitable for the A4 however points to speed management being an area of interest at those defined locations.

Clearly the total estimated cost exceeds the programme budget and for some interventions the BCR value is low. BCRs also vary at different locations which is why we are recommending a consultation and review using the tool to finalise the proposals following an on-the-ground visit to sense check the proposals.

Once this exercise is complete a final plan will be drawn up and an addendum to this report will be produced.

REFERENCES

Anderson, E. (2018). *Developing safe system road safety indicators for the UK*. London: Parliamentary Advisory Council for Transport Safety.

ID	Name	Carriagew	Unit of Co	Service Lif	Rural-Low	Rural-Med	Rural-High	Urban-Low	Urban-Me	Urban-High	Divided Ca	Hide	Ignore
1	Improve D i	lane km		5	4234	4704	5174	5504	6115	6727	1	0	0
2	Bicycle Lan i	per km		20	16934	18816	20698	22015	24461	26907	1	0	0
3	Bicycle Lan i	per km		20	123621	137357	151092	160707	178564	196420	1	0	0
4	Motorcycl i	per km		5	7620	8467	9314	9907	11007	12108	1	0	0
5	Motorcycl i	per km		20	8467	9408	10349	11007	12230	13453	1	0	0
6	Motorcycl i	per km		20	127008	141120	155232	165110	183456	201802	1	0	0
7	Horizontal i	lane km		20	458922	509914	560905	458922	509914	560905	1	0	0
8	Improve cl i	per carriag		5	8467	9408	10349	8467	9408	10349	1	0	0
9	Lane wider i	lane km		10	233695	259661	285627	233695	259661	285627	1	0	0
10	Lane wider i	lane km		10	542748	603053	663358	542748	603053	663358	1	0	0
11	Protected m	intersectio		10	94833	105370	115907	94833	105370	115907	1	0	0
12	Protected m	intersectio		10	127008	141120	155232	127008	141120	155232	1	0	0
13	Delineatio m	intersectio		5	4234	4704	5174	5504	6115	6727	1.5	0	0
14	Protected m	intersectio		10	150716	167462	184209	150716	167462	184209	1	0	0
15	Protected m	intersectio		10	169344	188160	206976	169344	188160	206976	1	0	0
16	Signalise in m	intersectio		20	677376	752640	827904	880589	978432	1076275	1.5	0	0
17	Signalise in m	intersectio		20	846720	940800	1034880	1100736	1223040	1345344	1.5	0	0
18	Grade sep: m	intersectio		20	10377400	11530445	12683489	10377400	11530445	12683489	1.5	0	0
19	Rail crossir m	unit		20	846720	940800	1034880	846720	940800	1034880	1.5	0	0
20	Roundaboi m	intersectio		20	846720	940800	1034880	846720	940800	1034880	1.5	0	0
21	Central hat u	per km		10	7200	8000	8800	7200	8000	8800	1	0	0
22	Centreline u	per km		10	7620	8467	9314	7620	8467	9314	1	0	1
23	Central tur m	per km		10	1088035	1208928	1329821	1088035	1208928	1329821	1	0	0
24	Central me m	per km		10	169344	188160	206976	169344	188160	206976	1	0	0
25	Duplicatio u	per carriag		20	5080320	5644800	6209280	5080320	5644800	6209280	1	0	0
26	Duplicate - u	per carriag		20	5080320	5644800	6209280	5080320	5644800	6209280	1	0	0
27	Duplicate - u	per carriag		20	5927040	6585600	7244160	7705152	8561280	9417408	1	0	0
28	Duplicate - u	per carriag		20	5927040	6585600	7244160	7705152	8561280	9417408	1	0	0
29	Duplicate - u	per carriag		20	6773760	7526400	8279040	8805888	9784320	10762752	1	0	0
30	Duplicate - u	per carriag		20	6773760	7526400	8279040	8805888	9784320	10762752	1	0	0
31	Service ro: i	per km		20	1270080	1411200	1552320	1651104	1834560	2018016	1	0	0
32	Additional i	per km		20	1270080	1411200	1552320	1651104	1834560	2018016	1	0	0
33	Implement u	per carriag		20	508032	564480	620928	508032	564480	620928	1	0	0
34	Upgrade p i	unit		10	12701	14112	15523	12701	14112	15523	1	0	0
35	Refuge Islam	unit		10	21168	23520	25872	21168	23520	25872	1	0	0
36	Unsignalis: m	unit		10	29635	32928	36221	29635	32928	36221	1.5	0	0
37	Signalised : m	unit		20	42336	47040	51744	42336	47040	51744	1.5	0	0
38	Grade sep: m	unit		20	1378629	1531810	1684991	1792218	1991353	2190489	1.5	0	0
40	Road surfa i	lane km		10	31329	34810	38291	31329	34810	38291	1	0	0
41	Clear road: i	per linear l		20	169344	188160	206976	169344	188160	206976	1	0	0
42	Clear road: i	per linear l		20	169344	188160	206976	169344	188160	206976	1	0	0
43	Sideslope i i	per linear l		20	3446150	3829056	4211962	3446150	3829056	4211962	1	0	0
44	Sideslope i i	per linear l		20	3446150	3829056	4211962	3446150	3829056	4211962	1	0	0
45	Roadside t: i	per linear l		20	230000	261000	290000	230000	261000	290000	1	0	0
46	Roadside t: i	per linear l		20	230000	261000	290000	230000	261000	290000	1	0	0
47	Shoulder s: i	per linear l		20	35562	39514	43465	35562	39514	43465	1	0	0
48	Shoulder s: i	per linear l		20	70278	78086	85895	70278	78086	85895	1	0	0
52	Restrict/cc: i	per km		10	259943	288826	317708	259943	288826	317708	1	0	0
54	Footpath p: i	per linear l		20	147329	163699	180069	147329	163699	180069	1	0	0
55	Footpath p: i	per linear l		20	180000	180000	180000	180000	180000	180000	1	0	0
56	Speed mar: i	per carriag		5	2117	2352	2587	2117	2352	2587	1	0	0
57	Traffic caln i	per carriag		10	98000	109000	121168	98000	109000	121168	1	0	0
59	Vertical rei	lane km		20	1148999	1276666	1404332	1148999	1276666	1404332	1	0	0
60	Overtaking i	per linear l		20	1270080	1411200	1552320	1270080	1411200	1552320	1	0	0
61	Median cr: m	intersectio		10	508032	564480	620928	508032	564480	620928	1	0	0
62	Clear road: i	per km		20	169344	188160	206976	169344	188160	206976	1	0	0
63	Sideslope i i	per km		20	3446150	3829056	4211962	3446150	3829056	4211962	1	0	0
64	Roadside t: i	per km		20	127008	141120	155232	127008	141120	155232	1	0	0
65	Clear road: i	per km		20	169344	188160	206976	169344	188160	206976	1	0	0
66	Sideslope i i	per km		20	3446150	3829056	4211962	3446150	3829056	4211962	1	0	0
67	Roadside t: i	per km		20	127008	141120	155232	127008	141120	155232	1	0	0
68	Speed mar: i	per carriag		5	2117	2352	2587	2117	2352	2587	1	0	0
69	Central me m	per km		10	169344	188160	206976	169344	188160	206976	1	0	0
71	Skid Resist i	lane km		10	152410	169344	186278	198132	220147	242162	1	0	0
72	Skid Resist i	per carriag		10	18628	20698	22767	24216	26907	29598	1	0	0
73	Pave road: i	lane km		10	169344	188160	206976	169344	188160	206976	1	0	0
74	Street light i	lane km		20	67738	75264	82790	54190	60211	66232	1	0	0
75	Street light i	intersectio		20	33869	37632	41395	27095	30106	33116	1	0	0
76	Street light i	unit		20	16934	18816	20698	13548	15053	16558	1	0	0
77	Shoulder ri	per carriag		10	8467	9408	10349	8467	9408	10349	1	0	0
78	Parking im: i	per carriag		20	11854	13171	14488	11854	13171	14488	1	0	0
79	Sight dista i	per linear l		20	23708	26342	28977	30821	34245	37670	1	0	0
80	Pedestrian i	per carriag		20	85000	85000	85000	85000	85000	85000	1	0	0

81	Side road g i	intersectio	20	1378629	1531810	1684991	1792218	1991353	2190489	1	0	0
152	Side road s i	intersectio	20	42336	47040	51744	55037	61152	67267	1	0	0
153	Side road t i	intersectio	10	29635	32928	36221	38526	42806	47087	1	0	0
163	Footpath p i	per linear l	20	279926	311028	342131	279926	311028	342131	1	0	0
164	Footpath p i	per linear l	10	16934	18816	20698	16934	18816	20698	1	0	0
171	Shoulder s i	per linear l	20	35562	39514	43465	35562	39514	43465	1	0	0
172	Shoulder s i	per linear l	20	70278	78086	85895	70278	78086	85895	1	0	0
173	Footpath p i	per linear l	20	147329	163699	180069	147329	163699	180069	1	0	0
174	Footpath p i	per linear l	20	180000	180000	180000	180000	180000	180000	1	0	0
177	Footpath p i	per linear l	20	279926	311028	342131	279926	311028	342131	1	0	0
178	Footpath p i	per linear l	10	16934	18816	20698	16934	18816	20698	1	0	0
182	Realignme i	lane km	20	70278	78086	85895	70278	78086	85895	1	0	0
186	Central me u	per km	20	169344	188160	206976	220147	244608	269069	1	0	0
187	Clear road: i	per km	20	169344	188160	206976	220147	244608	269069	1	0	0
188	Sideslope i i	per km	20	3446150	3829056	4211962	4479996	4977773	5475550	1	0	0
189	Roadside b i	per km	20	127008	141120	155232	165110	183456	201802	1	0	0
190	Wide centru	per linear l	20	5673	6303	6934	5673	6303	6934	1	0	0
191	School zon i	lane km	5	4234	4704	5174	5504	6115	6727	1	0	0
192	School zon i	unit	20	5080	5645	6209	4064	4516	4967	1	0	0
193	School zon m	unit	1	8467	9408	10349	11007	12230	13453	1	0	0
194	Unsignalis: m	unit	10	29635	32928	36221	29635	32928	36221	1	0	0



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