Northumberland
County Council

TECHNICAL SERVICES
DESIGN TEAM - TRAFFIC

Route Road Safety Study

B6318 Heddon-on-the-Wall to A68 Errington Arms Roundabout

DATE: February 2023

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Report Produced for:-	**Highways Programme Team**
Report Produced by:-	**Technical Services Design Team - Traffic**
Report Dated:-	**8 February 2023**
Author's	**Kevin Brown/John Mather**

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Route Road Safety Study

Prepared by
Technical Services –Design Team - Traffic

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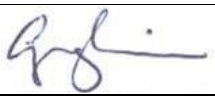
Approved	Gary Mills		8 February 2023
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Contents

Executive Summary

This report has been prepared in response to a request, from Northumberland County Council Highways Programme Team to undertake a Road Safety Study of the B6318 between Heddon-on-the-Wall in the east and A68 Errington Arms Roundabout in the west. Using a variety of data including collision and traffic flow data, as well as site observations, the study forms the basis of an evidence based collision led approach with a view to identifying a phased package of casualty reduction measures to be considered in a future year Local Transport Plan (LTP) Local Safety Schemes programme.

To demonstrate a robust approach to the review, the 15 km route, on the B6318 to be assessed, has been split into five route sections as follows:

- Section 1 - Heddon-on-the-Wall to Hollins Hill (3km);
- Section 2 - Hollins Hill to Harlow Hill (3km);
- Section 3 - Harlow Hill to West Deneside (3km);
- Section 4 - West Deneside to Halton Shields (3km); and
- Section 5 - Halton Shields to A68 Roundabout (3km).

Following interrogation of the STATS 19 collision records along the route, for the period 1 January 2019 to 31 December 2021, the main factors relevant to the collisions recorded are considered to be as follows:

- A higher KSI collision severity ratio of 42%, compared to the National Average (RCGB, 2019) of 31% for All Rural Roads;
- Powered two wheeler (27%); failure to give way (16%) and loss of control, head-on and right turn (all individually 11%) were the most prevalent types of collision;
- Three (16%) of the overall nineteen collisions listed occurred on bends, ten (52%) occurred in the general vicinity of junctions. Six (32%) occurred on otherwise straight sections of road away from junctions. 42% of the overall collisions occurred on a wet or icy road surface.
- 58% of collisions occurred eastbound, 32% westbound and on approaching side roads, 5% southbound and 5% northbound;
- Adverse weather conditions was not a significant factors in the collisions recorded.
- Collisions on a wet or icy surface and during darkness hours (no lights present) were higher than National norms;
- 4 (21%) of all collisions involved a vehicle skidding.

- The predominant vehicle types involved in recorded collisions were car (71%) and a powered two-wheeler (14%).
- Collisions by the time of year showed that most collisions occurred during Summer (26%) and Winter (36%);
- Collisions by day of the week were quite evenly spread other than a Friday or Monday when 27% and 21% respectively of collisions occurred; and
- 36% of collisions occurred during the (inter-peak) daytime and 27% during the PM peak.

Based upon the desktop study, data analysis and a subsequent site visit the overriding collision causation factors are considered to be as follows:

- Loss of control collisions, primarily on bends;
- Head-on type collisions;
- Right turn collisions at junctions;
- Failure to give way collisions;
- Collisions involving powered two wheelers;
- Collisions on a wet or icy road surface; and
- Collisions during darkness hours.

The five 3km route sections have been ranked in order of highest to lowest, based upon collision rate per million vehicle Km. This allows the sections to be categorised as follows:

HIGHEST PRIORITY

- Section 2 - Hollins Hill to Harlow Hill
- Section 1 – Heddon-on-the-Wall to Hollins Hill

MEDIUM PRIORITY

- Section 5 – Halton Shields to A68 Roundabout
- Section 4 - West Deneside to Halton Shields

LOWER PRIORITY

- Section 3 – Harlow Hill to West Deneside

Potential collision remedial measures considered to be appropriate for implementation to address the issues identified are as follows.

- Enhancement of the existing provision of bend warning and junction warning signs (including yellow backing board, advisory speed limit and ‘reduce speed now’ supplementary plates where necessary) to provide consistent provision throughout the route;
- Improved directional and advanced directional signing where appropriate;
- New or enhanced “chevron” warning signs or marker posts where appropriate;
- General road marking improvement (evaluation of extents of double white line, “SLOW” and edge lines for example);
- Use of red surface treatment or HFS surfacing where warranted;
- Provision of marker posts to identify accesses where appropriate;
- Improved give-way signage at junctions (main road and side roads) where required; and
- Vegetation clearance to improve clear visibility of existing directional and warning sign faces.

Additionally, although less relevant to road safety, in comparison with the above measures, the following works may also be beneficial when undertaking packages of works

- Replacement of weathered signs (although this should be a function of the maintenance regime); and
- Upgrading of any non-complaint blue bordered direction signs which remain.

The undertaking of significant improvement works, under systems of traffic management also affords an opportunity for routine maintenance tasks to be undertaken, which may have added road safety benefits. For example, gully cleansing, vegetation clearance and channel clearance.

The route sections considered to lie within the High, Medium & Lower Priority categories are shown below, together with potential remedial measures:

HIGH PRIORITY		
Option Ref	**Route Section**	**Proposed Intervention Measures**
1.1	**2**	General warning signing and road marking/road stud improvements/ refreshment particularly focussing on **Iron Sign Farm Crossroads** and **bends and crests between Iron Sign Farm Crossroads and north of Northside Farm.**
1.2	**1**	General warning signing and road marking/road stud improvements/ refreshment particularly focussing on **bends East and West of A69(T), Rudchester Crossroads** and **Eastbound approach to B6318/B6528 junction in Heddon-on-the-Wall**
MEDIUM PRIORITY		
Option Ref	**Route Section**	**Proposed Intervention Measures**
2.1	**5**	General warning signing and road marking/road stud improvements/ refreshment particularly focussing on **bends East of Halton Red House**
2.2	**4**	General warning signing and road marking/road stud improvements/ refreshment particularly focussing on **various junctions in vicinity of Wallhouses**
LOWER PRIORITY		
Option Ref	**Route Section**	**Proposed Intervention Measures**
3.1	**3**	General warning signing and road marking/road stud improvements/ refreshment particularly focussing on **B6318/B6309 Whittle Dene Crossroads and approaches.**

Experience of works undertaken on the B6320, A1068, A68, A696 and A697 in Northumberland, in recent years, following the undertaking a Route Safety Studies for those roads in 2021, 2020, 2019, 2018 and 2014 respectively, and evaluation of the type and scale of works which may be possible on the B6318, indicates that:

- **an allocation of £40,000 per route section** would allow the implementation of significant traffic sign, road marking and vegetation clearance. Depending on the scale of works to be undertaken on each individual section some sections may cost more than £40,000 and others less than £40,000, however the indicative figure provided is considered to be a suitable indicative overall cost for evaluation purposes.

Analysis shows that all five sections are predicted to provide first year rates of return (FYRR) between 367% and 157%.

It is recommended therefore that collision remedial measures, in line with those outlined above, demonstrate a positive return on investment and should be considered for implementation in a phased programme of work funded from future year LTP Local Safety Schemes programmes.

1 Introduction

1.1 Background

1.1.1 This report has been prepared in response to a request, from Northumberland County Council Highways Programme Team to undertake a Route Road Safety Study of the B6318 between Heddon-on-the-Wall in the east and A68 Errington Arms Roundabout in the west, a distance of 15 km.

1.2 Report purpose

1.2.1 The Study Team were advised that the scope of this report is to review the recent road safety record of the existing B6318 road between the locations mentioned above.

1.2.2 Using a variety of data including collision and traffic flow data as well as site observations, the study forms the basis of an evidence based collision led approach with a view to identifying a package of casualty reduction measures to be considered in a future year Local Transport Plan (LTP) programme.

1.2.3 The Study Team who prepared this report are:

KEVIN BROWN HNC, ENGTECH MICE, MCIHT, MSORSA
Senior Traffic Safety Engineer Northumberland County Council

JOHN MATHER DIP ASM, I.ENG, MCIHT, MSORSA
Traffic Safety Engineer Northumberland County Council
HE Certificate of Competency in Road Safety Audit

1.3 Road Safety Route Treatment

1.3.1 The following explains the general principles involved in a road safety route treatment process.

Objectives of Road Safety Route Treatments

1.3.2 In an ideal situation the road geometry and environment would naturally inform the road user of the standard of road and the potential hazards likely to be encountered. However, this may only be possible where the road is fully designed and built to the current Design Manual for Roads and Bridges (DMRB) design requirements and advice. For roads not built to current alignment and cross-section requirements and advice (i.e., many rural roads in Northumberland) the role of traffic signs and road markings becomes more significant to assist road users. Road safety route treatments may be considered to address a known collision issue, and/or to reduce road safety risk.

1.3.3 A key aim of the engineering measures used in road safety route treatments is to offer road users a consistent message at repeated features such as villages, junctions, carriageway pinch points or bends and vertical alignment so that road users recognise when to adjust their driving behaviour to suit the conditions. This consistency is the key to road safety route treatments. To enhance a road user's perception of the route ahead, similar sites along a route should be treated with similar treatments, even if some of these sites have no collision history.

Key Considerations

1.3.4 The first steps in the road safety route treatment process are to:

- identify the extents of the route;
- examine and compare the collision histories, rates, and severities;
- identify additional information to supplement collision data; and
- prioritise routes or lengths of routes for road safety route treatments, according to need and feasibility.

1.3.5 Road safety route treatment takes a holistic view of the route and recognises that road users experience roads as continuous lengths rather than as individual sites. It also recognises that collisions at different locations may share an underlying cause. Road safety route treatments also allow for a proactive approach to be taken, by assessing other sections of the route with similar characteristics (such as geometric features) which may carry a certain level of risk for road users even if there is not an identified collision problem.

1.3.6 Consideration of the route as a whole offers consistency for all road users, including cyclists, pedestrians, motorcyclists and horse-riders. This helps those unfamiliar with the route, as well as local users, to understand what is expected of them, for example, when negotiating bends, crossing junctions or passing through settlements. It also increases road users' awareness of hazards ahead by increasing the predictability of the road environment. One feature of road safety route treatments is the uniformity of treatment associated with geometric elements irrespective of the presence or level of collisions. By treating all the sites with similar characteristics, the same, the route as a whole becomes safer and provides an approach which combines both remedial and proactive (or preventative) treatment.

Benefits of Road Safety Route Treatments

1.3.7 Road safety route treatments demonstrate a proactive approach. Where individual sites along a route are treated there is a risk that the benefits of a reduced number of collisions at one site may be adversely impacted by an associated increase in collisions at other sites, in other words a migratory effect (e.g., the collision rate increases at untreated bends adjacent to a treated one).Treating all similar sites along a length, even those which do not have a collision problem, will make this less likely to occur.

Use of Road Safety Route Treatments

1.3.8 Road safety route treatments are generally applicable on sections of road found to have a higher number of collisions per kilometre (or rate of collisions based upon AADT flow) than expected when compared to similar routes. Road safety route treatments may also be applicable where:

- collisions are distributed throughout the route as a whole, rather than clustered at a number of specific sites;
- there is a higher than expected rate of a particular type of collision;
- collisions involve a particular type of road user; or
- there are higher than expected number of serious or fatal collisions.

1.3.9 Single site clusters may lie within a section identified as suitable for road safety route treatment. These locations should generally be treated in a consistent manner with the rest of the route treatment, although there may be a requirement for additional measures at the specific cluster site. There may be situations where a specific cluster site has a unique collision problem that is not replicated at other similar locations on the route which require treatment. In such cases it may be appropriate to treat the site with site specific measures.

1.3.10 A road safety route treatment approach can be used to successfully address the following typical collision patterns:

- Loss of control collisions as road users fail to judge the severity of bends or crests;
- Overshoot / failure to stop collisions at similar junctions along a route;
- Nose to tail (shunt) collisions as drivers fail to slow for congestion;
- Turning manoeuvres to / from similar side roads creating a collision problem;
- Inappropriate and dangerous overtaking;

- High rate of night-time (darkness) or adverse weather collisions;
- Striking or avoiding objects located too close to the edge of carriageway (e.g., street furniture or vegetation); and
- Collisions involving pedestrians, cyclists, motorcyclists and horse-riders

1.3.11 When selecting suitable road safety treatment for use on a route, one of the key considerations should be consistency. A consistent approach is intended to result in building up a drivers understanding of the route and increasing their perception of forthcoming hazards. Where a number of routes within an area are scheduled for road safety route treatments, consistent treatment of the routes will provide the benefit of network consistency. An inconsistent route or inconsistency between routes could potentially introduce road safety problems. For example, if a road user approaches a sharp bend along a route which is signed and marked in the same way as less severe bends, then the severity of the bend may be misunderstood.

Route Collision Reduction

1.3.12 The main advantage that road safety route treatments have over conventional collision treatments is that it can address collisions which are dispersed along a length of road that may be difficult to target or justify with site specific measures. Many sites with a history of high collision rates are likely to have already received some treatment, meaning targeting measures to treat remaining collisions can be difficult without using a route treatment approach.

First Year Rate of Return

1.3.13 Analysis of the safety and economics of schemes comprising typically improvements to signing, road markings and surfacing's has shown that on average such schemes result in 33% fewer collisions within the first year of operation. Generally, therefore schemes recoup their cost over relatively short periods of time. This evidence supports the theory that route treatments can achieve high rates of return.

Monitoring

1.3.14 Post construction monitoring is a crucial element of collision reduction schemes and as such, monitoring of the road safety performance of the scheme shall be robust, typically comparing three year collision periods pre and post introduction of measures for individual route sections addressed in phases, and the route as a whole upon completion of the various improvement phases.

1.4 Information Supplied

1.4.1 The following information was provided, or obtained by the Study Team, to inform this review:

- Police STATS 19 collision data for the B6318, within the review area, for the period 2019 to 2021 inclusive; and
- Traffic Flow data from temporary traffic count sites located on the B6318, within the study area.

1.5 Report Structure

1.5.1 An evidence-based approach has been adopted focussing on the analysis of the most recent, full year, validated collision data covering the 36-month period from a 1 January 2019 to 31 December 2021. A review of available traffic volume data has also been undertaken, whilst the study team also visited the site observing current operational conditions along the route.

1.5.2 Having considered route and cluster analysis informed by the above data and site observations, priority areas for improvement have been identified along the route together with a range of proposed intervention measures aimed at improving road safety and reducing the number of casualties.

1.5.3 To demonstrate a robust approach to the review, the 15 km route to be assessed has been split into five 3km long route sections.

This report is structured as follows:

- **Section 2** provides on overview of the study route;
- **Section 3** analyses the collision details extracted from the data provided and includes details of traffic flow and site observations;
- **Section 4** reviews options for improvements;
- **Section 5** highlights key findings and recommendations
- **Section 6** summarises the conclusions of the study.

This report also includes supporting technical appendices.

2 Route Overview

2.1 Background

2.1.1 The B6318 is a rural road in western Northumberland. Often called the Military Road it runs (within Northumberland) from Heddon-on-the-Wall in the east to Gilsland in the west. The road is notable as it runs alongside Hadrian's Wall for much of its length, and long stretches of the road are built on the foundations of the wall.

2.1.2 The section of the route being considered by this study is between Heddon-on-the-Wall to the east and A68/B6318 Errington Arms Roundabout in the west (a length of 15km). The route is single carriageway throughout, subject to mainly a derestricted speed limit other than a 30mph speed limit at Heddon-on-the-Wall, and a 40mph speed limit west of that settlement and a 40mph speed limit at Harlow Hill. The route is primarily unlit other than within Heddon-on-the-Wall in the east, two lighting columns located in Harlow Hill, and in the vicinity of the A68/B6318 Errington Arms Roundabout.

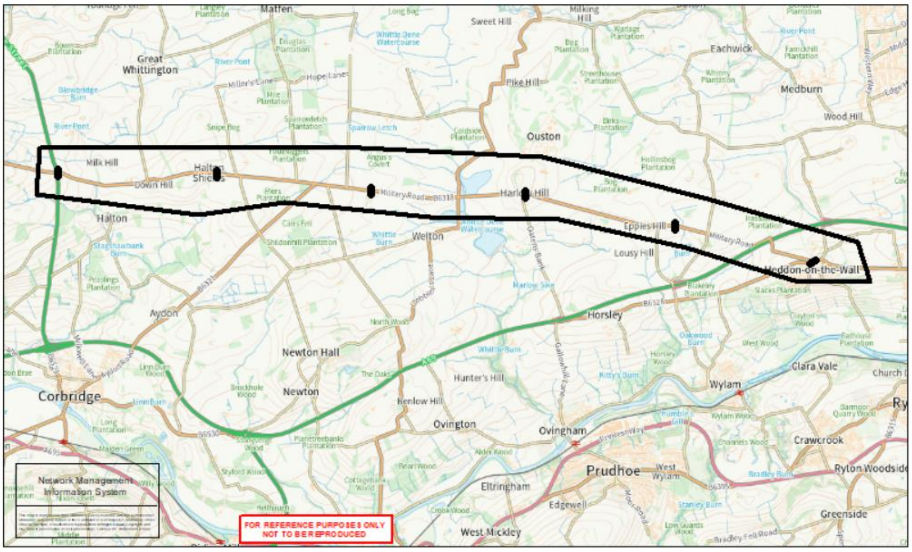


Figure 1 – Extents of the Study Area – B6318 – Heddon-on-the-Wall to A68/B6318 Junction, near The Errington Arms PH.

2.1.3 The whole section of the B6318, within the study area, lies within the World Heritage site of Hadrian's Wall. **See Figure 2** below.

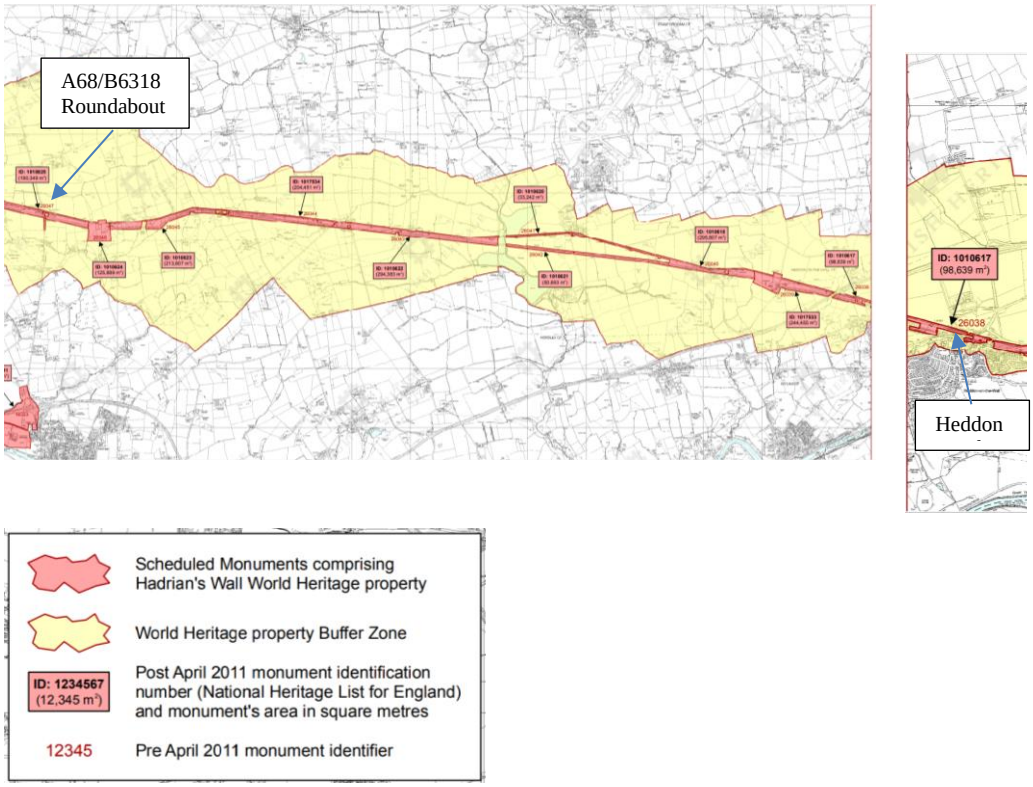


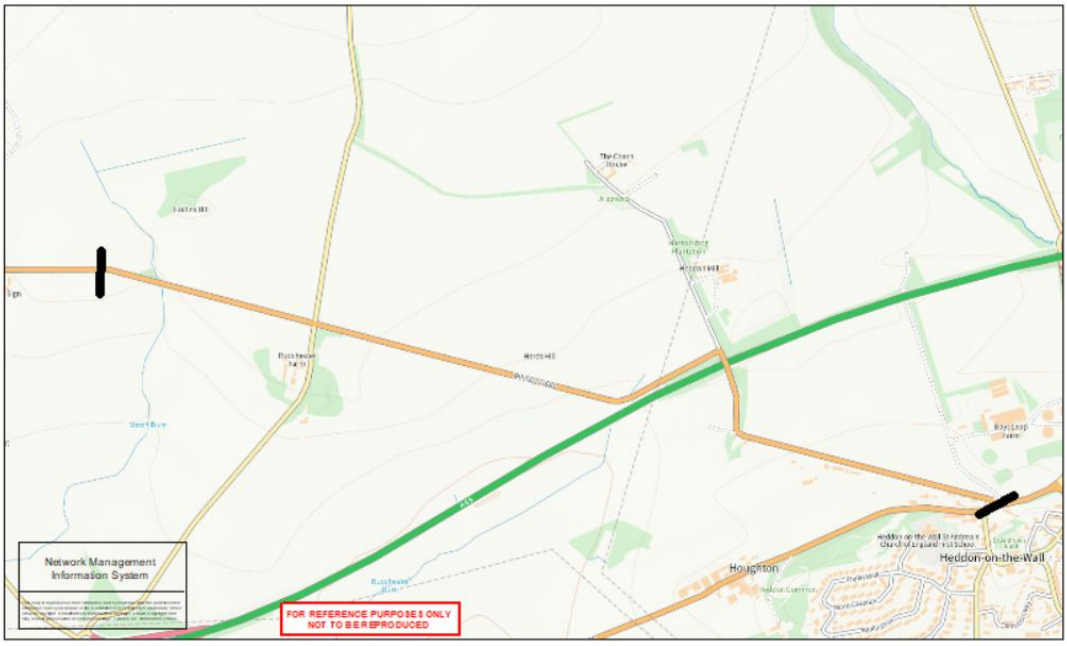
Figure 2 – Extracts from - Frontiers of the Roman Empire – Hadrian's Wall *English Heritage)

2.1.4 The B6318, not forming part of the Primary Route Network, it is not ranked within The European Road Assessment Programme (EuroRAP) – 2022 Risk Rating for Northumberland.

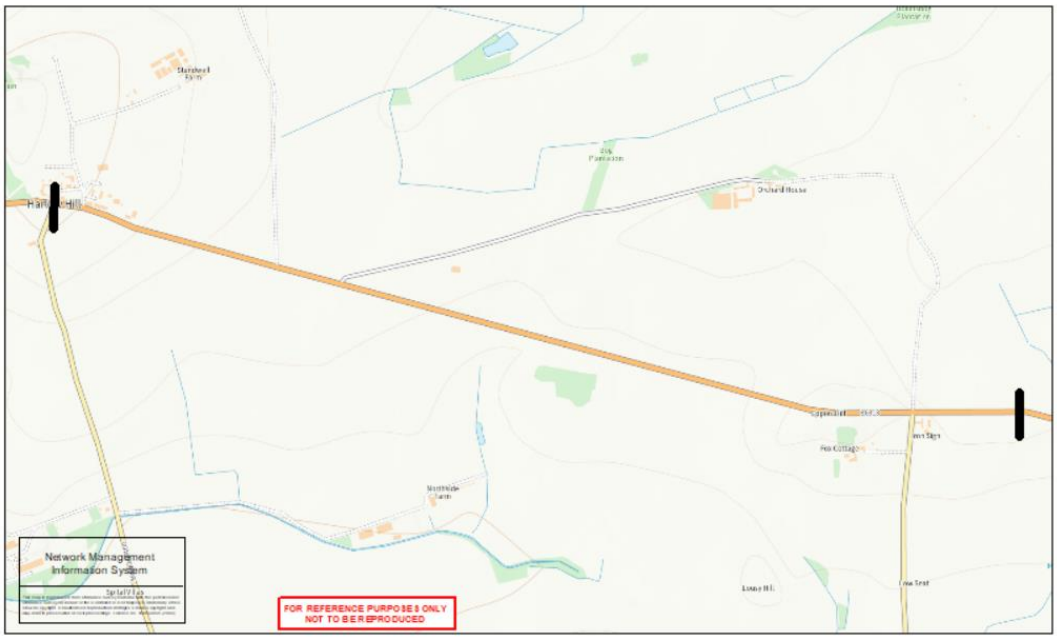
2.1.5 For the purposes of this Road Safety Study the route has been split into six route sections, from east to west, as follows:

- Section 1 - Heddon-on-the-Wall to Hollins Hill (3km);
- Section 2 - Hollins Hill to Harlow Hill (3km);
- Section 3 Harlow Hill to West Deneside (3km);
- Section 4 West Deneside to Halton Shields (3km); and
- Section 5 - Halton Shields to A68 Roundabout (3km).

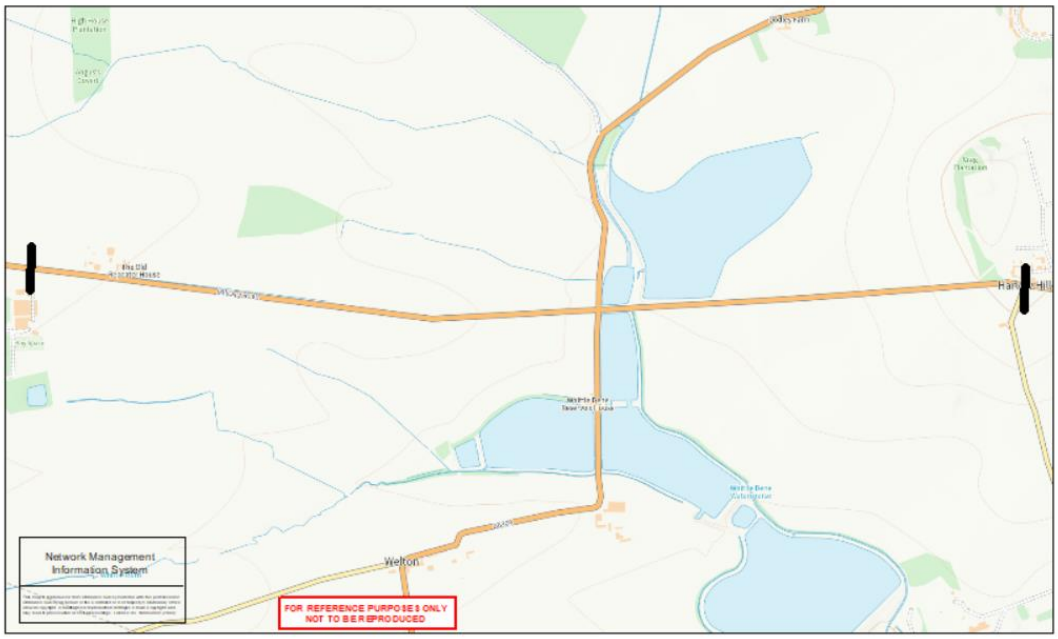
2.1.6 The maps below identify the exact extents of the five route sections considered.



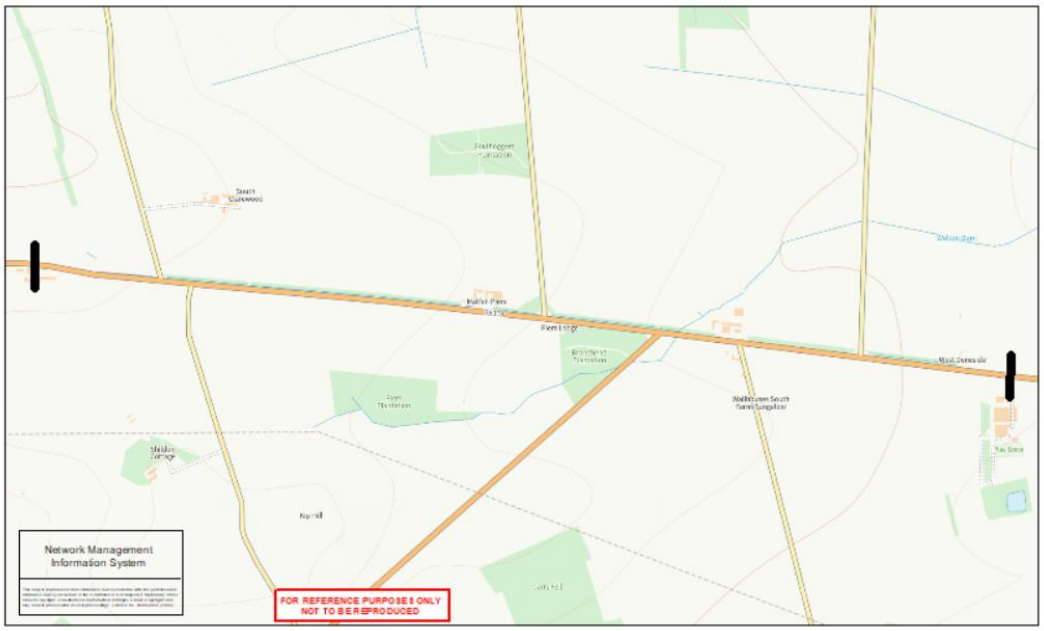
SECTION 1 - Heddon-on-the-Wall to Hollins Hill



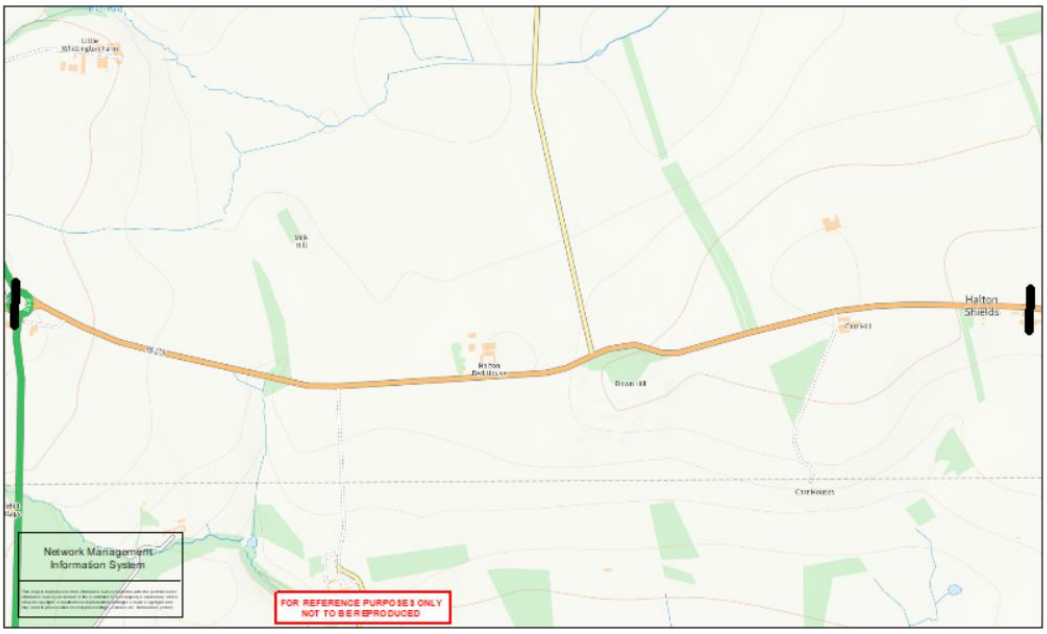
SECTION 2 - Hollins Hill to Harlow Hill



SECTION 3 - Harlow Hill to West Deneside



SECTION 4 – West Deneside to Halton Shields



SECTION 5 - Halton Shields to A68 Roundabout

2.2 Recent Local Safety Schemes on the B6318

2.2.1 In the period 2015/16 to 2019/20 some LTP Local Safety High Risk Sites and other improvement schemes (primarily signage, road marking, road studs and surfacing improvements) have been undertaken, to address a recent history of personal injury collisions, at the following locations which affect the main carriageway:

- **2015/16 -** B6320/C342 Matfen Piers Junction, Signing Improvements – LSS Rural Roads (**Section 4);**
- **2018/19 -** B6318 Halton Shields to West Deneside – LSS High Risk Site (**Section 4 & Section 5**); and
- **2019/20 –** B6318/C257 Rudchester Crossroads – LSS High Risk Site (**Section 1**).
- **2021/22** – A68 Beukley Bank to A69(T) at A68/B6318 Roundabout – Improved signs and markings undertaken as part of A68 Route Action Scheme (**Section 5**).

2.2.2 The Study Team is also aware of the following surface dressing/ road maintenance schemes planned, or already having taken place, on the B6318 in recent years:

- **2018/19** – Surface Dressing – B6318 Halton Red House to Stagshaw Roundabout (**Section 5)**;
- **2019/20** - Resurfacing – B6318 High Seat towards Rudchester Phase 1 (**Section 2)**;
- **2020/21** - Resurfacing – B6318 High Seat towards Rudchester Phase 2 (**Section 1 & Section 2)**; and
- **2020/21** - Resurfacing - B6318 Wallhouses (**Section 4**).

2.2.3 The following carriageway resurfacing scheme is planned in 2023/24:

- B6318 West of High Seat towards Harlow Hill – Phase 2 (Section 2 and Section 3).

2.2.4 It is evident therefore, that as this study considers collision data for the period 1 January 2019 to 31 December 2021 during the course of this period, and subsequent to it in 2022, the above schemes have been, or will be, implemented with the intention of providing road safety benefits.

2.2.5 Consequently, further proposals at such locations will not be identified within this report where the recent works undertaken (or proposed) are considered to be suitable in providing road safety benefits.

3 Data Analysis

3.1 Collision Data

3.1.1 Collision data for the time period 1 January 2019 to 31 December 2021 (36 months) was obtained by the Road Safety Study Team for the purpose of this report. The outputs have been plotted on a series of drawings displaying collision locations and collision severity. These can be found in **Appendix A** of this report.

3.1.2 The limits of the search area used, for collision data provided for this Road Safety Study, covers the B6318 route between the B6318/B6320 junction at Heddon-on-the-Wall, in the east and the A68/B6318 Errington Arms Roundabout in the west (15 km in all).

3.1.3 To aid analysis, the 15km route has been divided into five 3km long route sections. The overall route, and then the five individual sections, have been analysed in the tables which follow.

3.1.4 **When comparing B6318 collision percentages with National statistics, for Non-Built up roads, RCGB data for 2019 has been used as collision totals for 2020 and 2021 were greatly affected by various Covid-19 global pandemic restrictions and conditions.**

3.2 Collision Analysis

3.2.1 The following tables indicate the numbers of personal injury collisions (PICs) and casualties recorded within the scheme extents during the 36-month period reviewed. The tables also review several specific circumstances of the collision in order to identify potential trends.

3.2.2 The tables reflect the overall collisions for the whole route and also the five individual sections reviewed as follows:

- Section 1 - Heddon-on-the-Wall to Hollins Hill (3km);
- Section 2 - Hollins Hill to Harlow Hill (3km);
- Section 3 Harlow Hill to West Deneside (3km);
- Section 4 West Deneside to Halton Shields (3km); and
- Section 5 - Halton Shields to A68 Roundabout (3km).

3.3 Section 1 to Section 5 – All – Heddon-on-the-Wall to A68 Errington Arms Rbt

Year		Collisions				Casualties			
		Slight	Serious	Fatal	Total	Slight	Serious	Fatal	Total
	2019	5	3	0	**8**	9	2	0	**11**
	2020	5	3	0	**8**	8	3	0	**11**
	2021	1	2	0	**3**	2	4	0	**6**
	Total	11	8	0	**19**	19	9	0	**28**

Table 3.3.1 – Total Collisions and Casualties

3.3.1 **Table 3.3.1** above indicates that during this time period there were a total of eight serious and eleven slight personal injury collisions recorded within the extents of the scheme collision data search area. Twenty-eight casualties resulted from the nineteen collisions, an average of 1.47 casualties per collision.

3.3.2 **Table 3.3.2** below shows a summary of the average number of collisions/casualties over the full 36-month period, together with severity ratios. The B6318 route shows a higher KSI collision severity ratio of 42%, compared to the National Average (RCGB, 2019) of 31% for All Rural Roads.

36-month Collisions/year	KSI Collision Severity Ratio	36-month Casualties/year	KSI Casualty Severity Ratio
6.33	42%	9.33	32%

Table 3.3.2 – Total Collisions and Casualties

3.3.3 **Table 3.3.3** below shows the direction of travel during these collisions.

Direction of Travel	Total	%
Eastbound	11	*58*
Westbound	6	*32*
Southbound	1	*5*
Northbound	1	*5*
Total	**19**	***100***

Table 3.3.3 – Direction of Travel

3.3.4 **Table 3.3.4** below shows the details of collisions where the description mentions the presence of a bend, or proximity of a junction, at the general location of the collision. Collisions described as occurring on straight sections of road are not shown. Three (16%) of the overall nineteen collisions listed occurred on bends, ten (52%) occurred in the general vicinity of junctions. Six (32%) occurred on otherwise straight sections of road away from junctions. 42% of the overall collisions occurred on a wet or icy road surface.

Direction of Travel	Right Hand Bend	Left Hand Bend	Junction	Total
Eastbound	1	0	4	**5**
Westbound	1	1	4	**6**
Southbound	0	0	1	**1**
Northbound	0	0	1	**1**
Total	**2**	**1**	**10**	**13**

Table 3.3.4 – Collisions on a bend or at a junction

3.3.5 The collision types are classified in **Figure 3.3.1** below. This indicates that powered two wheeler (27%); failure to give way (16%) and loss of control, head-on and right turn (all individually 11%) type collisions are the most prevalent.

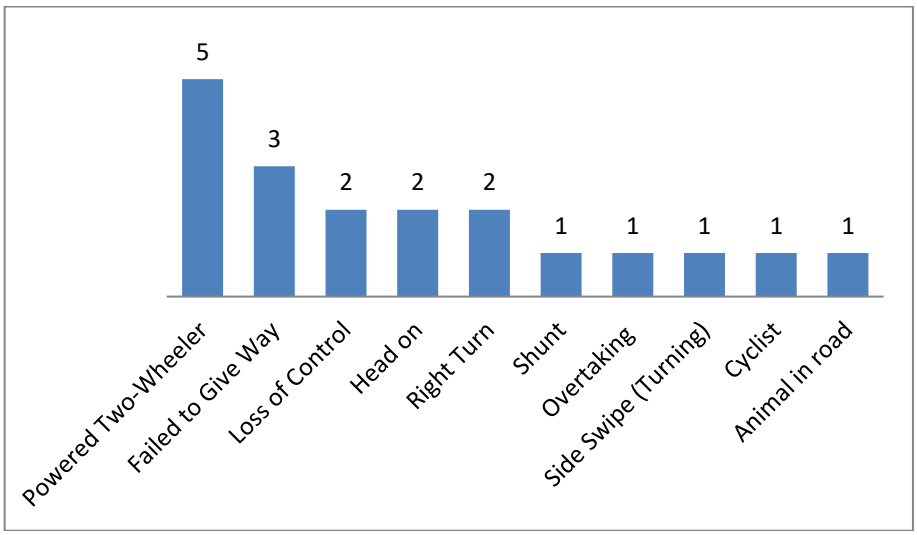


Figure 3.3.1 – Collisions by Type

3.3.6 The mode of transport, involved in the collisions recorded, is classified in **Figure 3.3.2** below. An average of 1.8 modes of transport were involved in each collision with the predominant vehicle types involved being a car (71%) and a powered two-wheeler (14%).

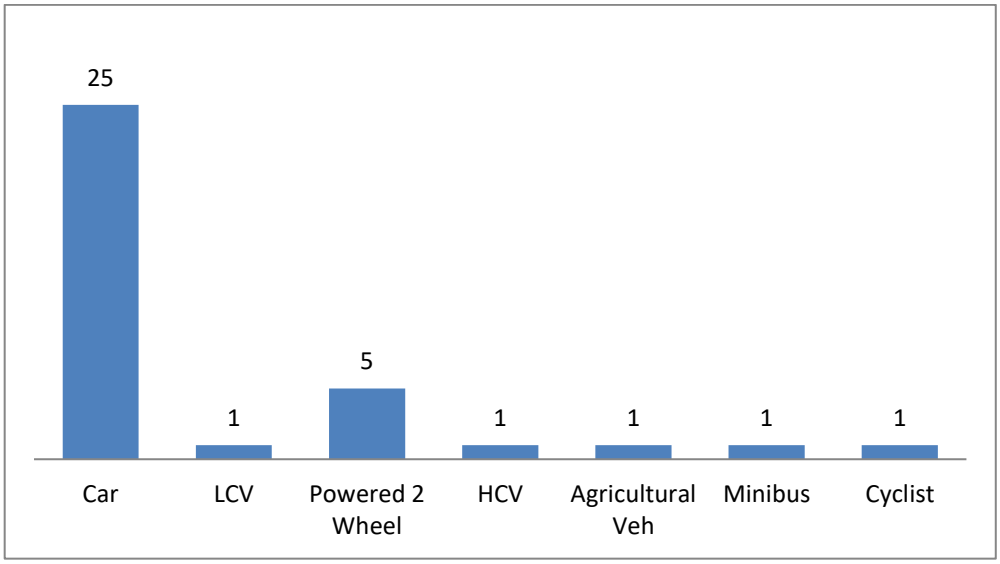


Figure 3.3.2 – Mode of Transport involved in Collisions.

3.3.7 The information contained in the collision data has been compared to national averages obtained from the DfT publication "Road Casualties in Great Britain" (RCGB), 2019 in **Figures 3.3.3** to **3.3.5** below.

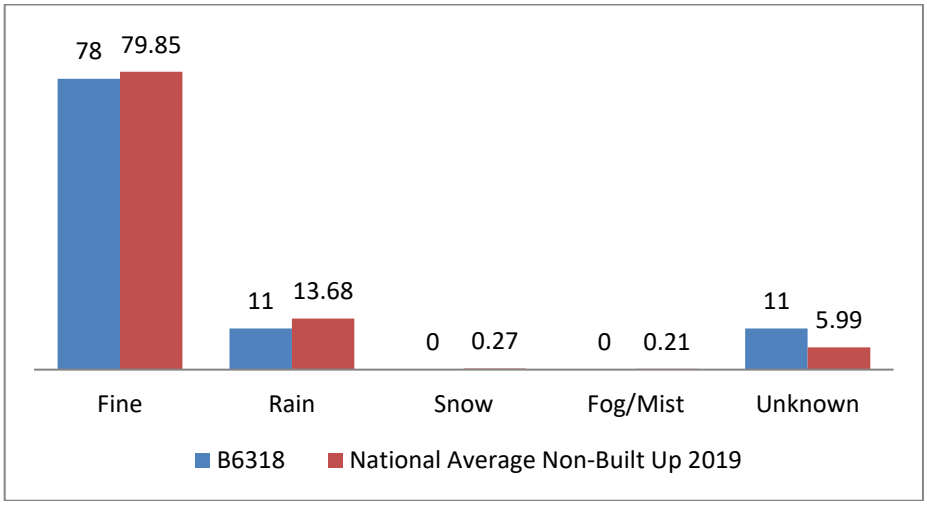


Figure 3.3.3 – Percentage Collisions by Weather Conditions.

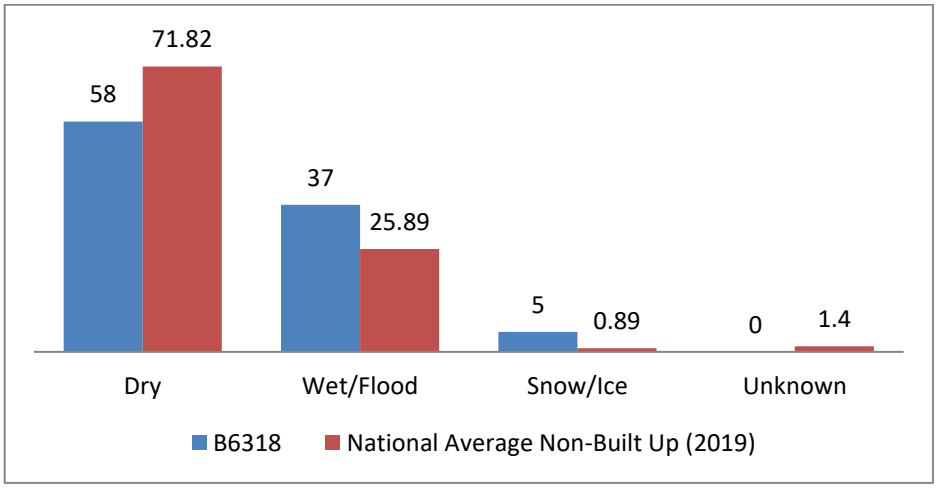


Figure 3.3.4 – Percentage Collisions by Road Surface Conditions.

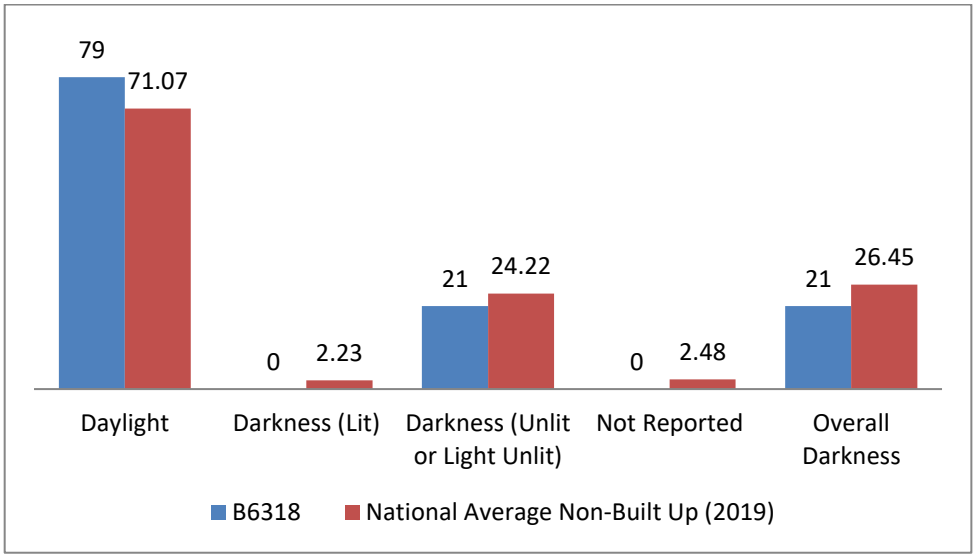


Figure 3.3.5 – Percentage Collisions by Lighting Conditions.

3.3.8 The above tables show that adverse weather and lighting conditions were not significant factors in the collisions recorded. With only collisions on a wet or icy surface being higher than National norms.

3.3.9 4 (21%) of all collisions involved a vehicle skidding.

3.3.10 Details of the time of day, day of week and month of year during which collisions occurred are shown in **Figures 3.3.6 to 3.3.8** below.

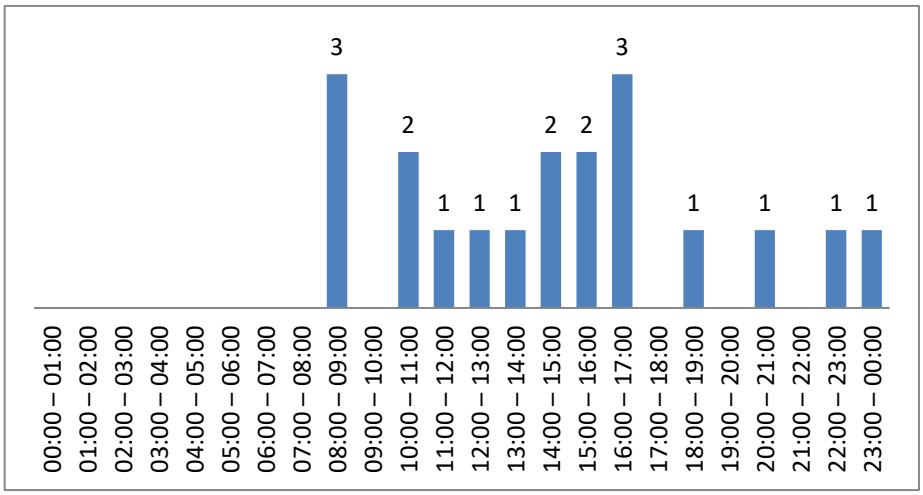


Figure 3.3.6 – Collisions by Time of Day

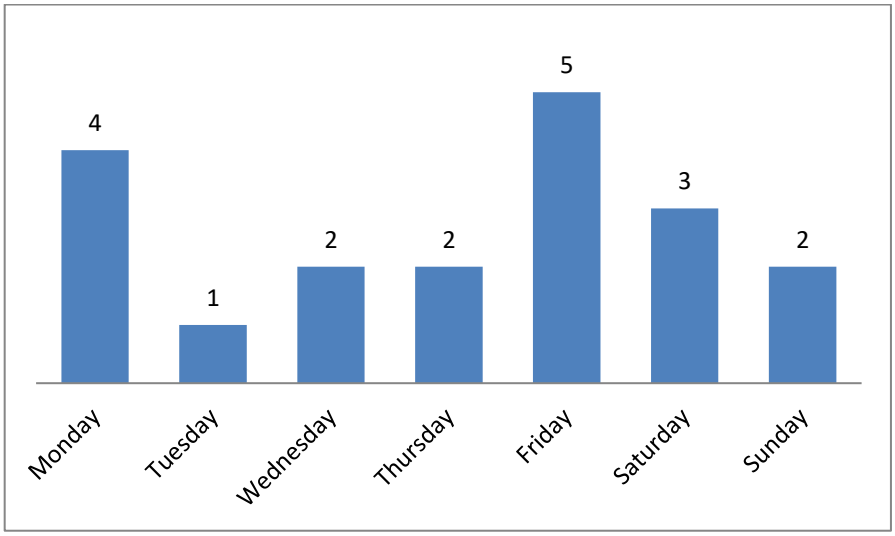


Figure 3.3.7 – Collisions by Day of Week

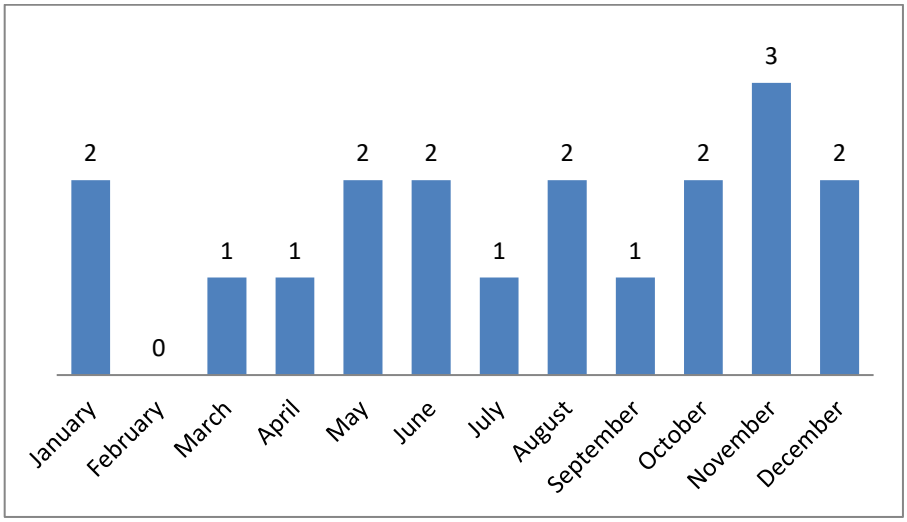


Figure 3.3.8 – Collisions by Month of Year

3.3.11 Collisions by the time of year showed that most collisions occurred during Summer (26%) and Winter (36%). Collisions by day of the week were quite evenly spread other than a Friday or Monday when 26% and 21% respectively of collisions occurred. 36% of collisions occurred during the (inter-peak) daytime and 27% during the PM peak.

Collisions By Time of Day (%)	
AM Peak (06:00 – 10:00)	*16*
Inter Peak (daytime)	*36*
PM Peak (15:00 – 18:00)	*27*
Off Peak (evening)	*21*

Collisions By Time of Year (%)	
Spring (Mar to May)	*21*
Summer (June to Aug)	*27*
Autumn (Sept to Oct)	*16*
Winter (Nov to Feb)	*36*

3.4 Section 1 – Heddon-on-the-Wall to Hollins Hill

Period		Collisions				Casualties			
		Slight	Serious	Fatal	Total	Slight	Serious	Fatal	Total
	2019	0	1	0	**1**	0	1	0	**1**
	2020	0	1	0	**1**	2	1	0	**3**
	2021	1	0	0	**1**	2	0	0	**2**
	Total	1	2	0	**3**	4	2	0	**6**

Table 3.4.1 – Total Collisions and Casualties

3.4.1 **Table 3.4.1** above indicates that during this time period there were two serious and one slight personal injury collisions recorded within the extents of the scheme collision data search area. Six casualties resulted from the three collisions, an average of 2.0 casualties per collision.

3.4.2 **Table 3.4.2** below shows a summary of the average number of collisions/casualties over the full 36-month period, together with severity ratios.

36-month Coll's/yr	KSI Collision Severity Ratio	36-month Cas/yr	KSI Casualty Severity Ratio
1.0	67%	2.0	33%

Table 3.4.2 – Total Collisions and Casualties

3.4.3 **Table 3.4.3** below shows the direction of travel for all collisions.

Direction of Travel	Total	%
Eastbound	1	*33.3*
Westbound	1	*33.3*
Northbound	1	*33.3*
Total	**3**	***100***

Table 3.4.3 – Direction of Travel

3.4.4 **Table 3.4.4** below shows the details of collisions where the description mentions the presence of a bend or close proximity of a junction, at the location of the collision.

Direction of Travel	Right Hand Bend	Left Hand Bend	Junction
Eastbound	0	0	1
Westbound	1	0	0
Northbound	0	0	1
Total	**1**	**0**	**1**

Table 3.4.4 – Collisions on a bend or at a junction

3.4.5 The collision types are classified in **Figure 3.4.1** below.

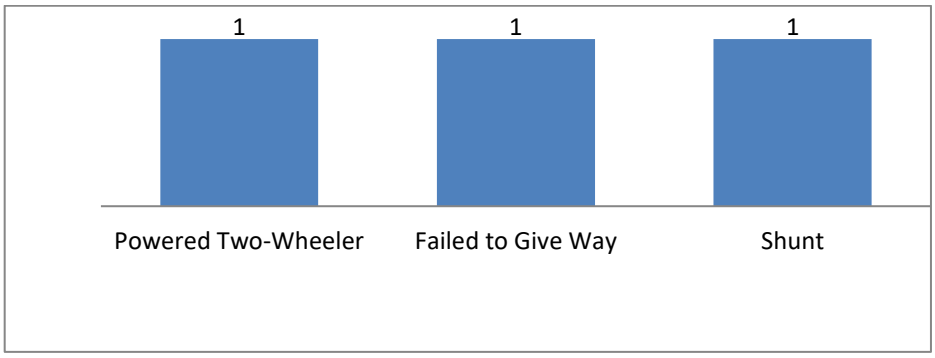


Figure 3.4.1– Collisions by Type

3.4.6 The mode of transport, involved in the collisions recorded, is classified in **Figure 3.4.2** below. An average of 1.67 modes of transport were involved in each collision, with the predominant vehicle type being a car (80%).

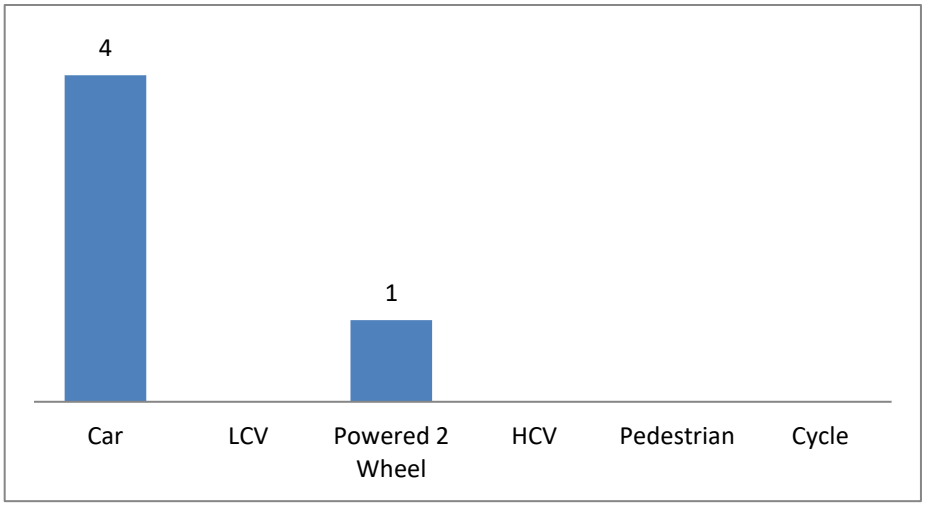


Figure 3.4.2 – Mode of Transport

3.4.7 The information contained in the collision data has been compared to national averages obtained from the DfT publication "Road Casualties in Great Britain" (RCGB), 2019 in **Figures 3.4.3** to **3.4.5** below.

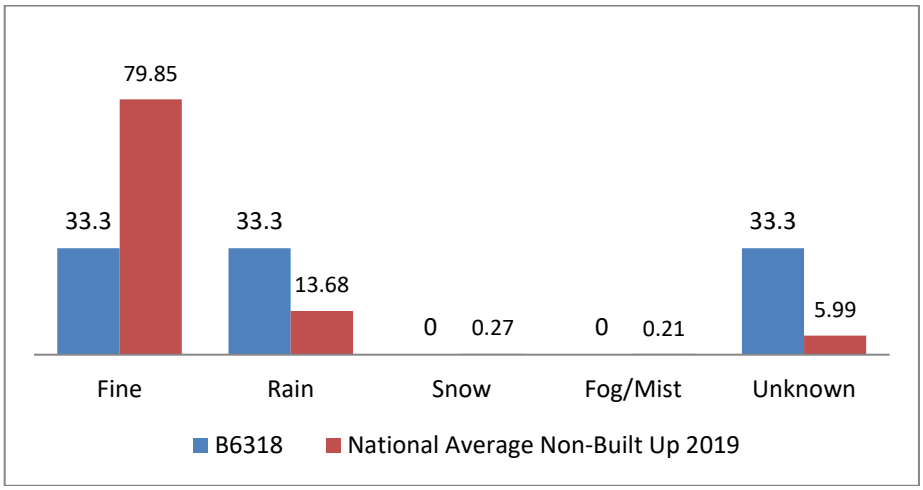


Figure 3.4.3 – Percentage Collisions by Weather Conditions.

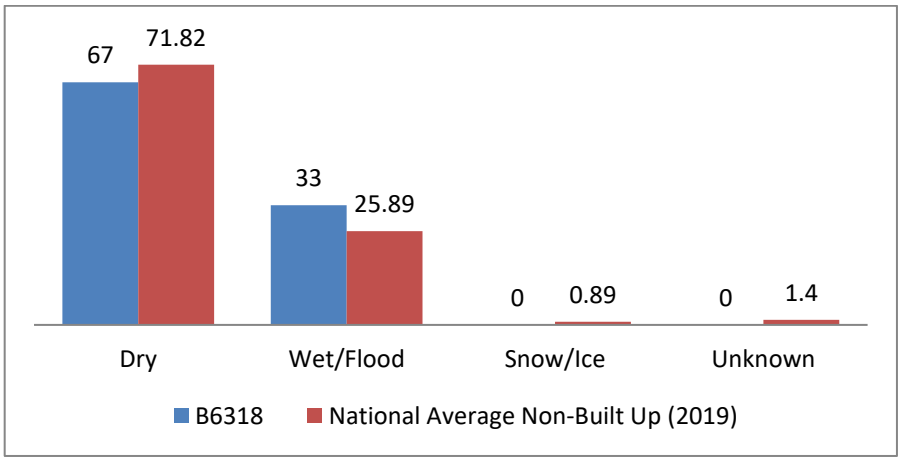


Figure 3.4.4 – Percentage Collisions by Road Surface Conditions.

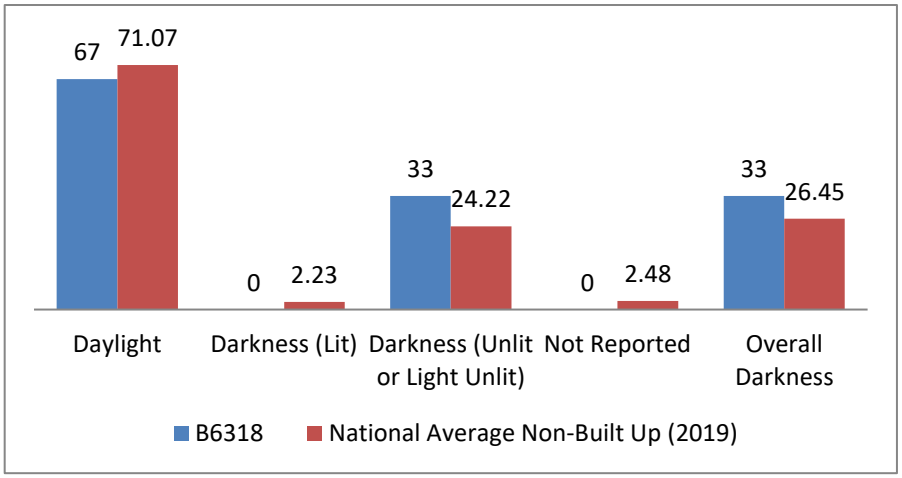


Figure 3.4.5 – Percentage Collisions by Lighting Conditions.

3.4.8 The above table's show that adverse road surface conditions and lighting conditions were factors in the collisions recorded, being above National norms.

3.4.9 Details of the time of day, day of week and month of year during which collisions occurred are shown in **Figures 3.4.6** to **3.4.8** below.

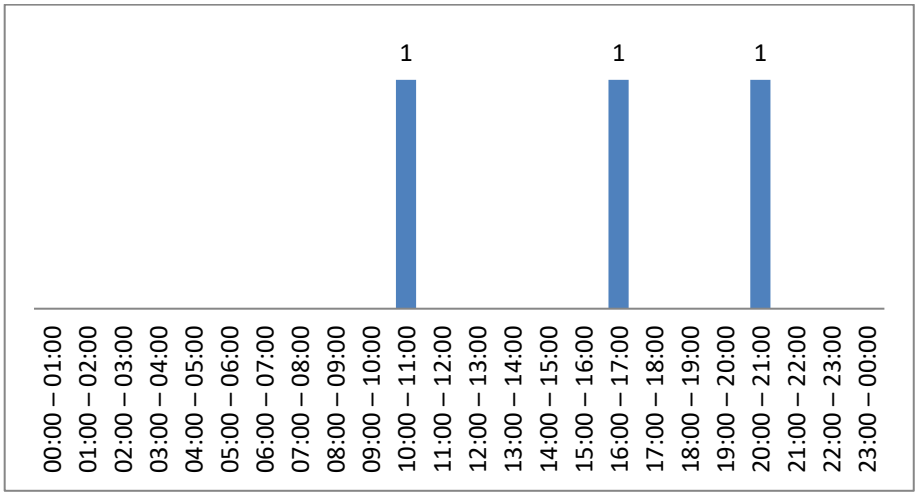


Figure 3.4.6 – Collisions by Time of Day

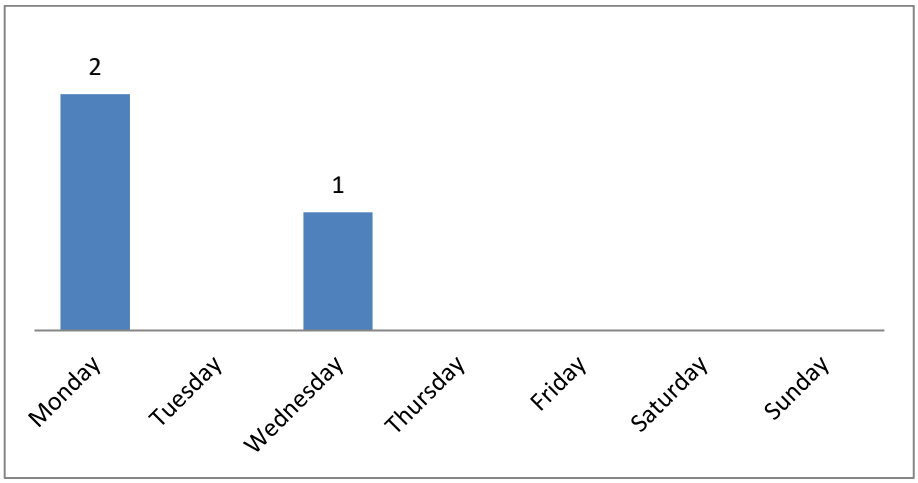


Figure 3.4.7 – Collisions by Day of Week

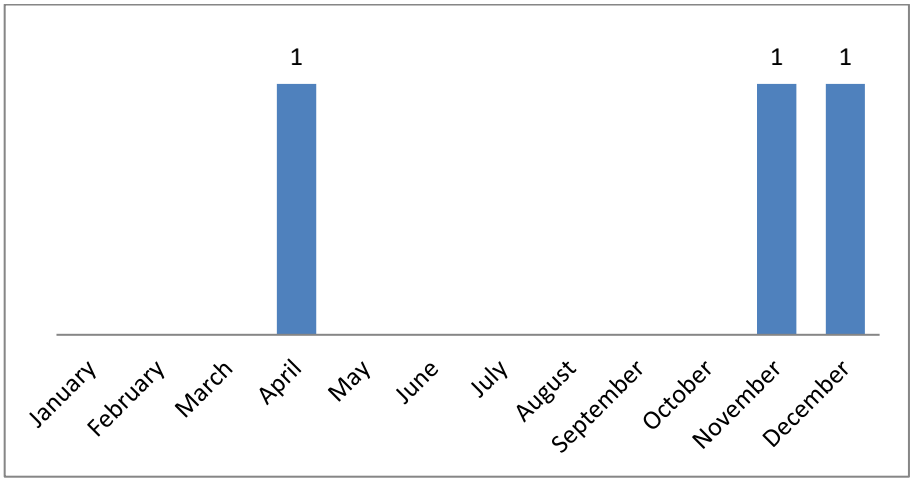


Figure 3.4.8 – Collisions by Month of Year

3.4.10 Collisions by time and day of the week show no significant trends, but 67% of collisions occurred during Winter months and on a Monday.

Collisions By Time of Day (%)	
AM Peak (06:00 – 10:00)	*0*
Inter Peak (daytime)	*33*
PM Peak (15:00 – 18:00)	*33*
Off Peak (evening)	*33*

Collisions By Time of Year (%)	
Spring (Mar to May)	*33*
Summer (June to Aug)	*0*
Autumn (Sept to Oct)	*0*
Winter (Nov to Feb)	*67*

3.5 Section 2 – Hollins Hill to Harlow Hill

Period		Collisions				Casualties			
		Slight	Serious	Fatal	Total	Slight	Serious	Fatal	Total
	2019	2	1	0	**3**	5	1	0	**6**
	2020	2	0	0	**2**	2	0	0	**2**
	2021	0	2	0	**2**	0	4	0	**4**
	Total	4	3	0	**7**	7	5	0	**12**

Table 3.5.1 – Total Collisions and Casualties

3.5.1 **Table 3.5.1** above indicates that during this time period there were a total of three serious and four slight personal injury collisions recorded within the extents of the scheme collision data search area. Twelve casualties resulted from the seven collisions, an average of 1.71 casualties per collision.

3.5.2 **Table 3.5.2** below shows a summary of the average number of collisions/casualties over the full 36-month period, together with severity ratios.

36-month Coll's/yr	KSI Collision Severity Ratio	36-month Cas/yr	KSI Casualty Severity Ratio
2.33	42%	4.0	42%

Table 3.5.2 – Total Collisions and Casualties

3.5.3 **Table 3.5.3** below shows the direction of travel for all collisions.

Direction of Travel	Total	%
Eastbound	6	*86*
Westbound	0	*0*
Southbound	1	*14*
Total	**7**	***100***

Table 3.5.3 – Direction of Travel

3.5.4 **Table 3.5.4** below shows the details of collisions where the description mentions the presence of a bend or close proximity of a junction, at the location of the collision.

Direction of Travel	Right Hand Bend	Left Hand Bend	Junction
Eastbound	1	0	1
Westbound	0	0	0
Southbound	0	0	1
Total	**1**	**0**	**2**

Table 3.5.4 – Collisions on a bend or at a junction

3.5.5 The collision types are classified in **Figure 3.5.1** below.

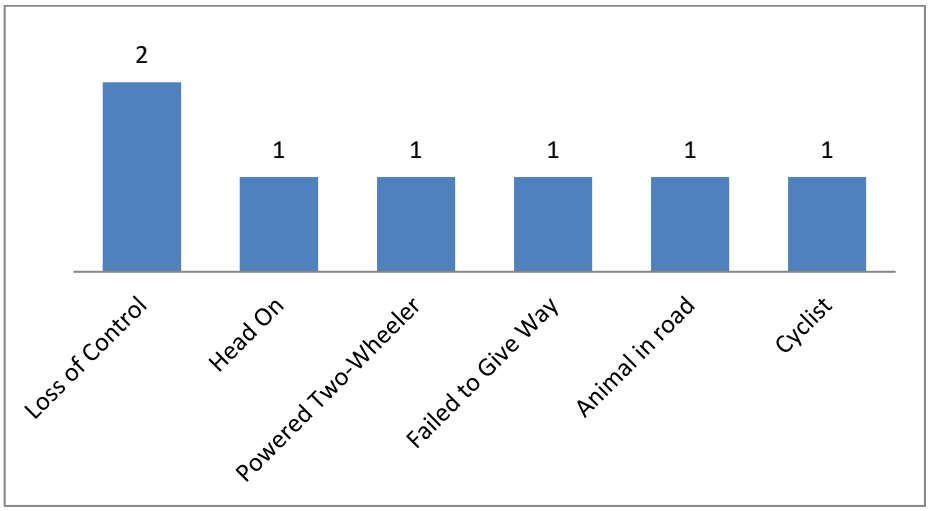


Figure 3.5.1 – Collisions by Type

3.5.6 The mode of transport, involved in the collisions recorded, is classified in **Figure 3.5.2** below. An average of 1.86 modes of transport were involved in each collision, with the predominant vehicle type involved being the car (77%).

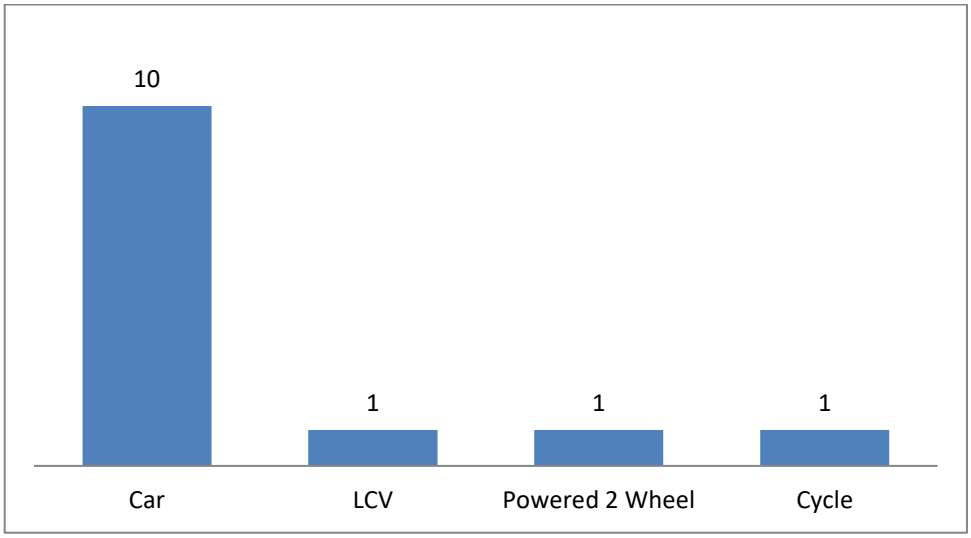


Figure 3.5.2 – Mode of Transport involved in Collisions.

3.5.7 The information contained in the collision data has been compared to national averages obtained from the DfT publication "Road Casualties in Great Britain" (RCGB), 2019 in **Figures 3.5.3 to 3.5.5** below.

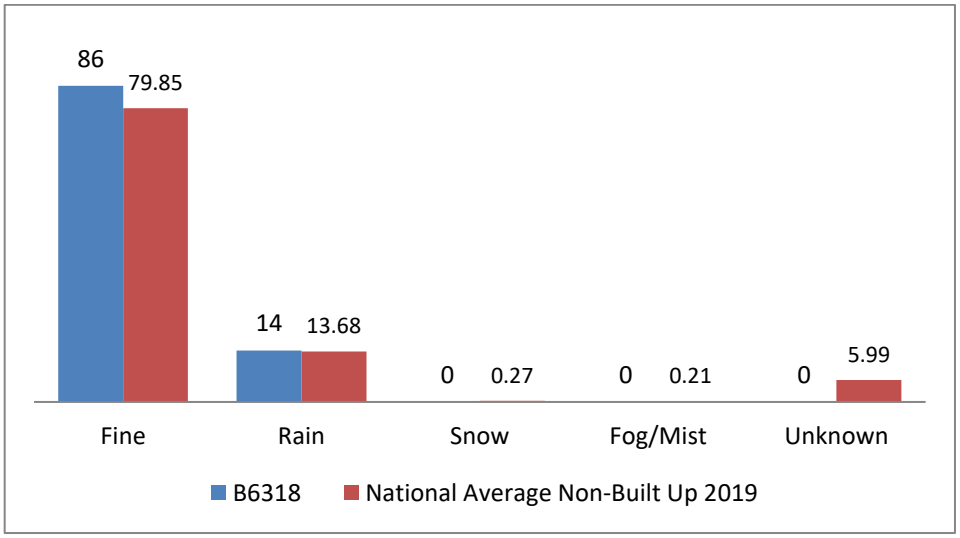


Figure 3.5.3 – Percentage Collisions by Weather Conditions.

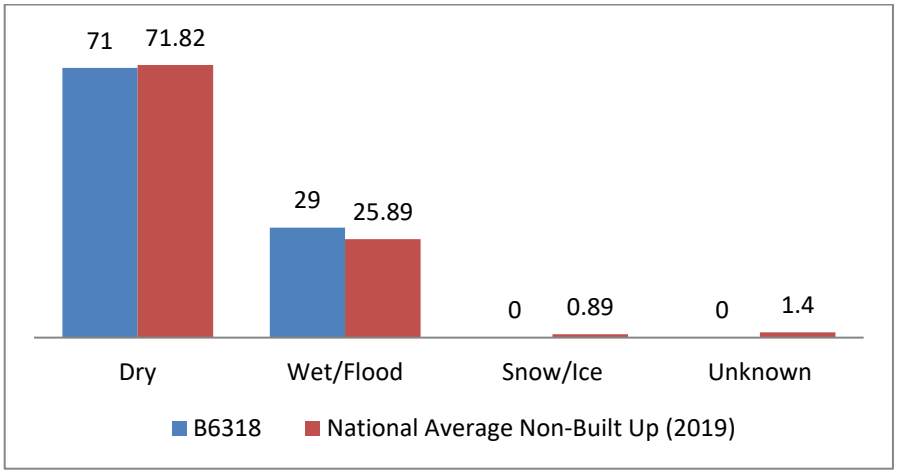


Figure 3.5.4 – Percentage Collisions by Road Surface Conditions.

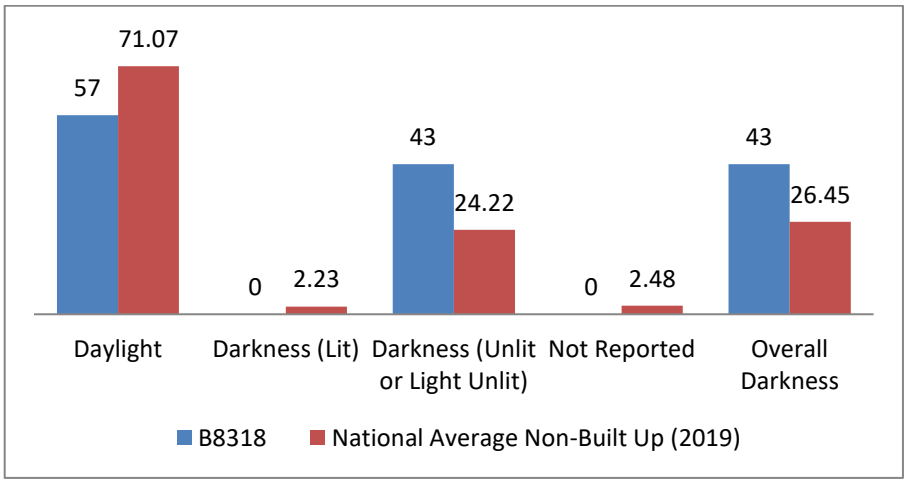


Figure 3.5.5 – Percentage Collisions by Lighting Conditions.

3.5.8 The above table's show that collisions on a wet road surface and during darkness hours were above National norms.

3.5.9 Details of the time of day, day of week and month of year during which collisions occurred are shown in **Figures 3.5.6** to **3.5.8** below.

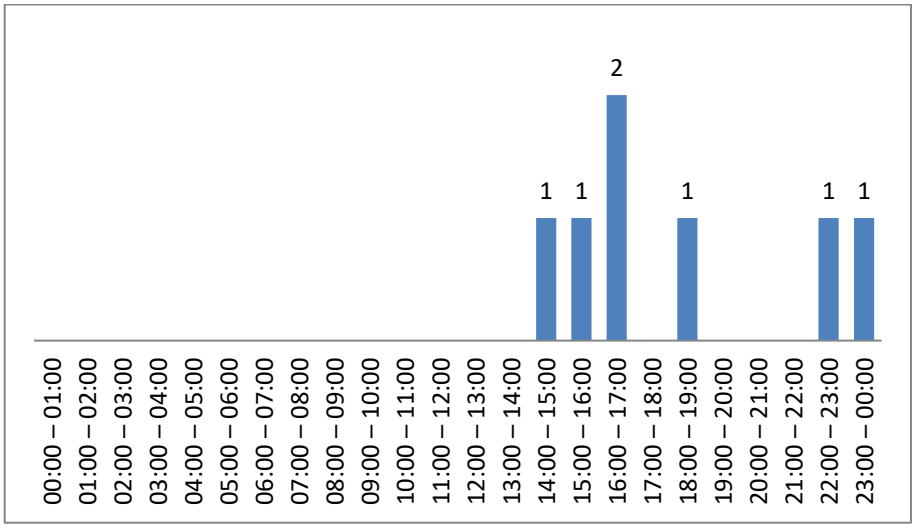


Figure 3.5.6 – Collisions by Time of Day

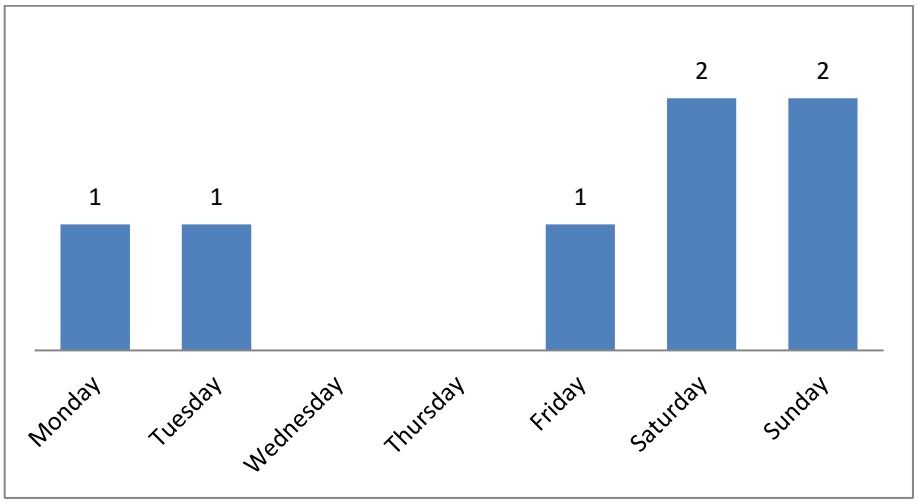


Figure 3.5.7 – Collisions by Day of Week

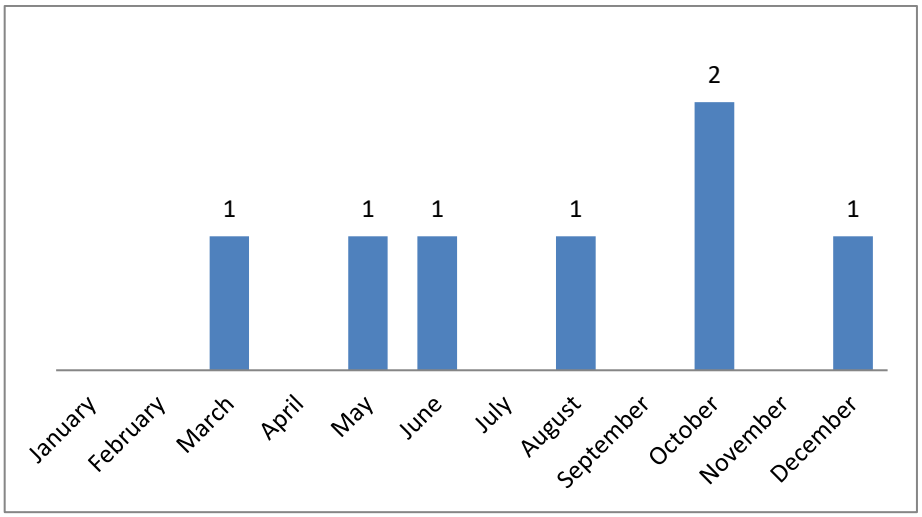


Figure 3.5.8 – Collisions by Month of Year

3.5.10 Most collisions occurred towards the end of the week (including weekends) and during the PM peak.

Collisions By Time of Day (%)	
AM Peak (06:00 – 10:00)	*0*
Inter Peak (daytime)	*14*
PM Peak (15:00 – 18:00)	*43*
Off Peak (evening)	*43*

Collisions By Time of Year (%)	
Spring (Mar to May)	*29*
Summer (June to Aug)	*29*
Autumn (Sept to Oct)	*29*
Winter (Nov to Feb)	*13*

3.6 Section 3 – Harlow Hill to West Deneside

Period		Collisions				Casualties			
		Slight	Serious	Fatal	Total	Slight	Serious	Fatal	Total
	2019	2	0	0	**2**	4	0	0	**4**
	2020	1	0	0	**1**	1	0	0	**1**
	2021	0	0	0	**0**	0	0	0	**0**
	Total	3	0	0	**3**	5	0	0	**5**

Table 3.6.1 – Total Collisions and Casualties

3.6.1 Table **3.6.1** above indicates that during this time period there were a total of three slight personal injury collisions recorded within the extents of the scheme collision data search area. Five casualties resulted from the four collisions, an average of 1.67 casualties per collision.

3.6.2 **Table 3.6.2** below shows a summary of the average number of collisions/casualties over the full 36-month period, together with severity ratios.

36-month Coll's/yr	KSI Collision Severity Ratio	36-month Cas/yr	KSI Casualty Severity Ratio
1.0	Zero	1.67	Zero

Table 3.6.2 – Total Collisions and Casualties

3.6.3 **Table 3.6.3** below shows the direction of travel for all collisions.

Direction of Travel	Total	%
Eastbound	2	*67*
Westbound	1	*33*
Total	**3**	***100***

Table 3.6.3 – Direction of Travel

3.6.4 **Table 3.6.4** below shows the details of collisions where the description mentions the presence of a bend or close proximity of a junction, at the location of the collision.

Direction of Travel	Right Hand Bend	Left Hand Bend	Junction
Eastbound	0	0	1
Westbound	0	0	1
Total	**0**	**0**	**2**

Table 3.6.4 – Collisions on a bend or at a junction

3.6.5 The collision types are classified in **Figure 3.6.1** below.

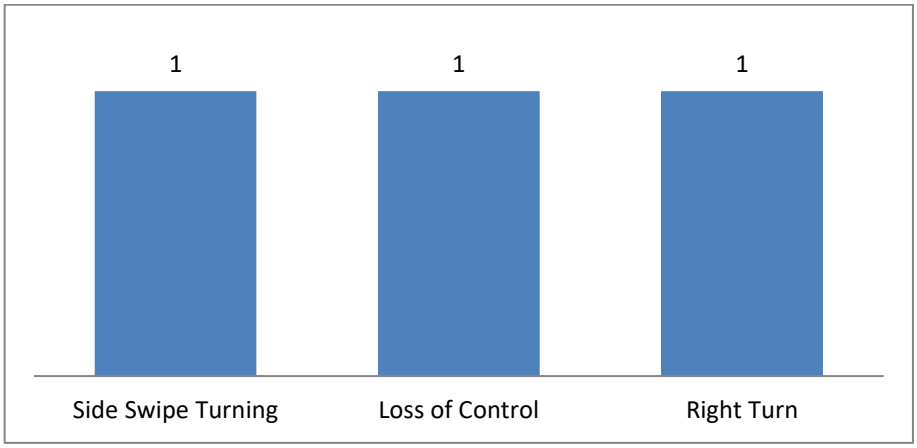


Figure 3.6.1 – Collisions by Type

3.6.6 The mode of transport, involved in the collisions recorded, is classified in **Figure 3.6.2** below. An average of 1.67 modes of transport were involved in each collision, with the predominant vehicle type involved being the car (60%).

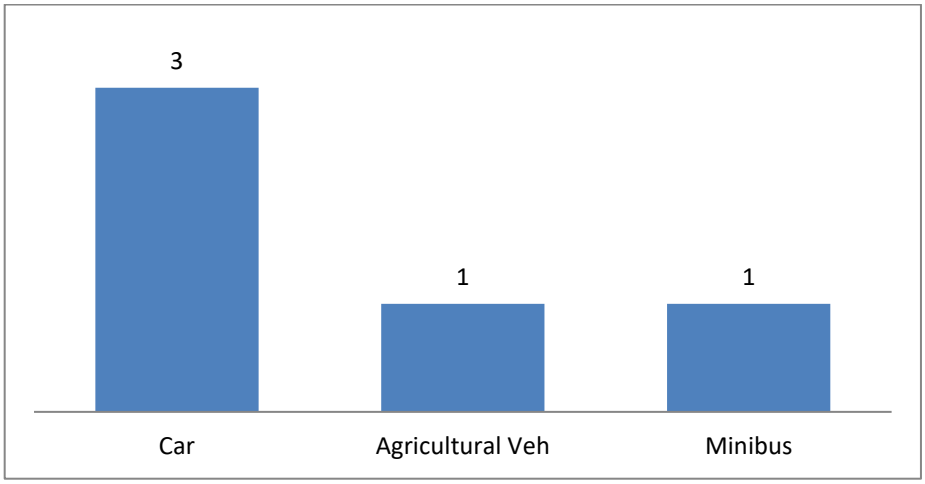


Figure 3.6.2 – Mode of Transport involved in Collisions.

3.6.7 The information contained in the collision data has been compared to national averages obtained from the DfT publication "Road Casualties in Great Britain" (RCGB), 2019 in **Figures 3.6.3** to **3.6.5** below.

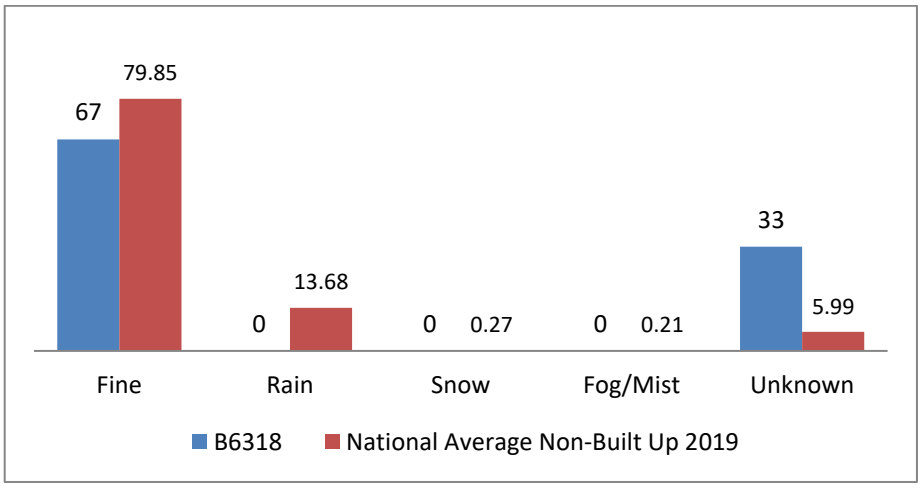


Figure 3.6.3 – Percentage Collisions by Weather Conditions.

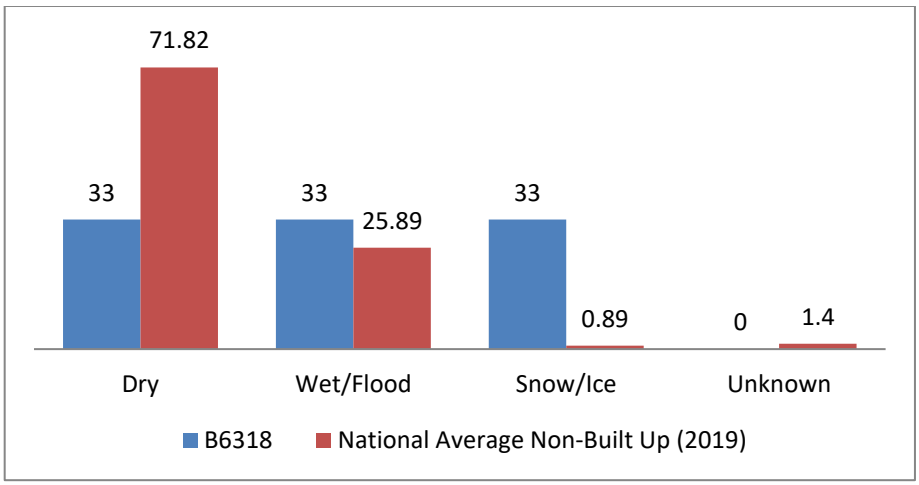


Figure 3.6.4 – Percentage Collisions by Road Surface Conditions.

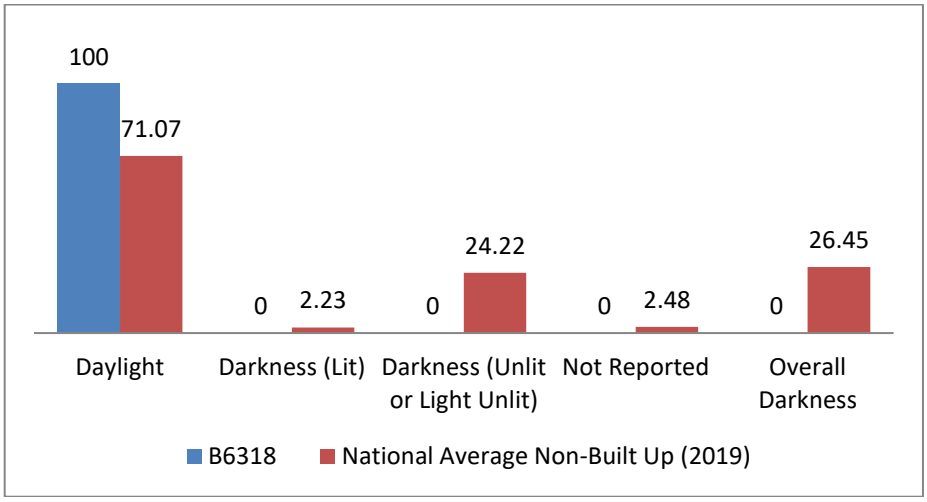


Figure 3.6.5 – Percentage Collisions by Lighting Conditions.

3.6.8 The above table's show that collisions on a wet, snowy or icy road surface were above National norms.

3.6.9 Details of the time of day, day of week and month of year during which collisions occurred are shown in **Figures 3.6.6** to **3.6.8** below.

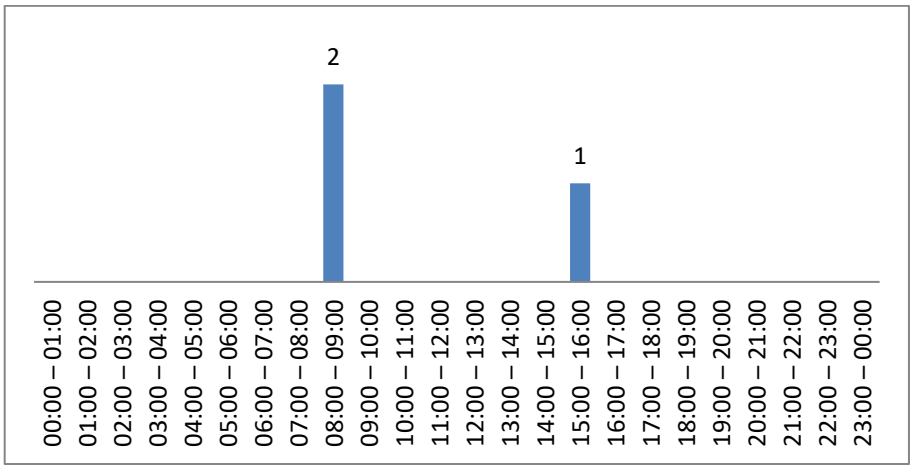


Figure 3.6.6 – Collisions by Time of Day

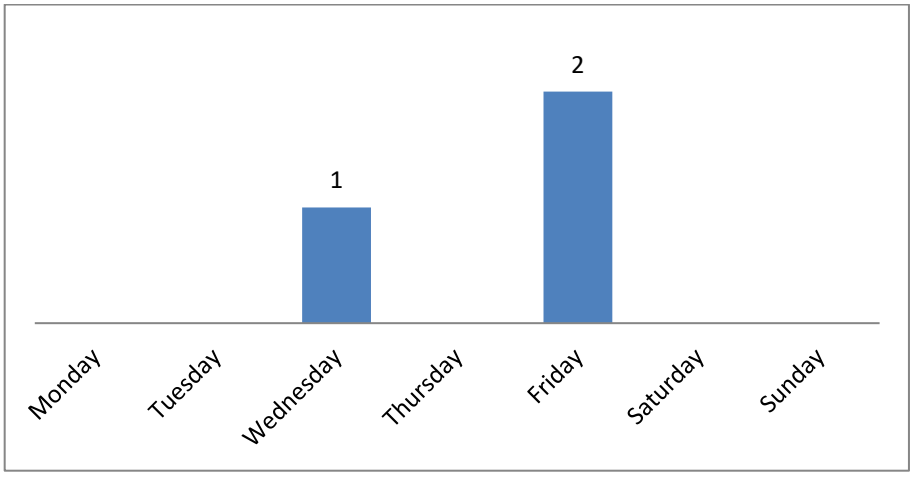


Figure 3.6.7 – Collisions by Day of Week

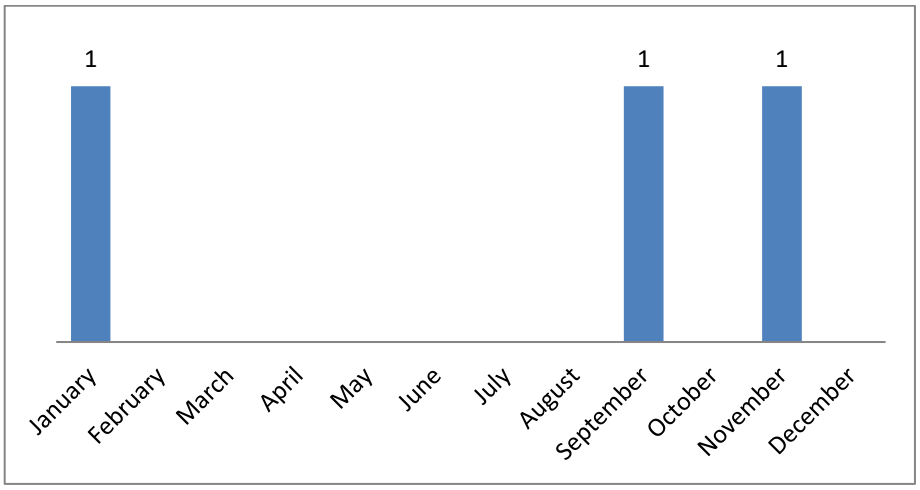


Figure 3.6.8 – Collisions by Month of Year

3.6.10 Most collisions occurred during the AM peak, towards the end of the week and during Winter months.

Collisions By Time of Day (%)	
AM Peak (06:00 – 10:00)	*67*
Inter Peak (daytime)	*0*
PM Peak (15:00 – 18:00)	*33*
Off Peak (evening)	*0*

Collisions By Time of Year (%)	
Spring (Mar to May)	*0*
Summer (June to Aug)	*0*
Autumn (Sept to Oct)	*33*
Winter (Nov to Feb)	*67*

3.7 Section 4 – West Deneside to Halton Shields

Period		Collisions				Casualties			
		Slight	Serious	Fatal	Total	Slight	Serious	Fatal	Total
	2019	0	1	0	**1**	0	1	0	**1**
	2020	1	1	0	**2**	2	1	0	**3**
	2021	0	0	0	**0**	0	0	0	**0**
	Total	1	2	0	**3**	2	2	0	**4**

Table 3.7.1 – Total Collisions and Casualties

3.7.1 **Table 3.7.1** above indicates that during this time period there were a total of two serious and one slight personal injury collisions recorded within the extents of the scheme collision data search area. Four casualties resulted from the three collisions, an average of 1.33 casualties per collision.

3.7.2 **Table 3.7.2** below shows a summary of the average number of collisions/casualties over the full 36-month period, together with severity ratios.

36-month Coll's/yr	KSI Collision Severity Ratio	36-month Cas/yr	KSI Casualty Severity Ratio
1.0	67%	1.33	50%

Table 3.7.2 – Total Collisions and Casualties

3.7.3 **Table 3.7.3** below shows the direction of travel for all collisions.

Direction of Travel	Total	%
Eastbound	2	*67*
Westbound	1	*33*
Total	**3**	***100***

Table 3.7.3 – Direction of Travel

3.7.4 **Table 3.7.4** below shows the details of collisions where the description mentions the presence of a bend or close proximity of a junction, at the location of the collision.

Direction of Travel	Right Hand Bend	Left Hand Bend	Junction
Eastbound	0	0	1
Westbound	0	0	1
Total	**0**	**0**	**2**

Table 3.7.4 – Collisions on a bend or at a junction

3.7.5 The collision types are classified in **Figure 3.7.1** below.

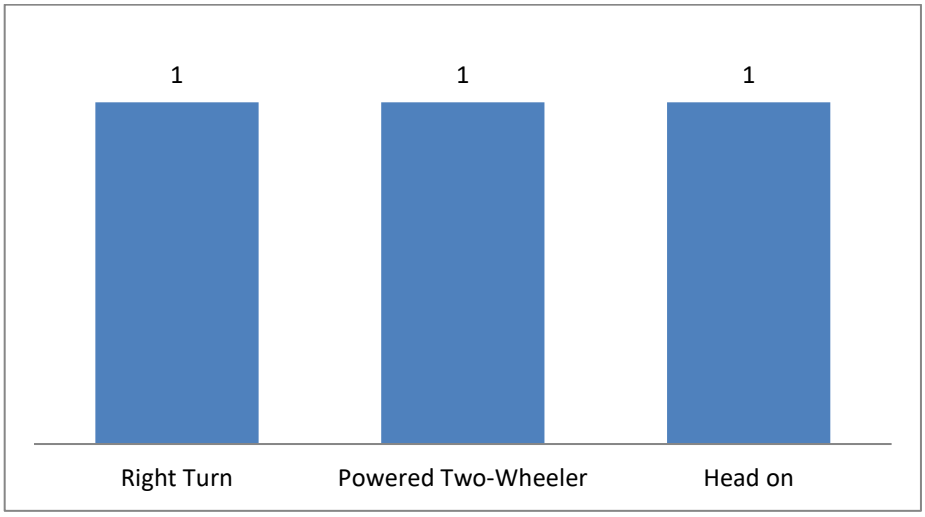


Figure 3.7.1 – Collisions by Type

3.7.6 The mode of transport, involved in the collisions recorded, is classified in **Figure 3.7.2** below. An average of 2.33 modes of transport were involved in the collisions, with the predominant vehicle type involved being the car (86%).

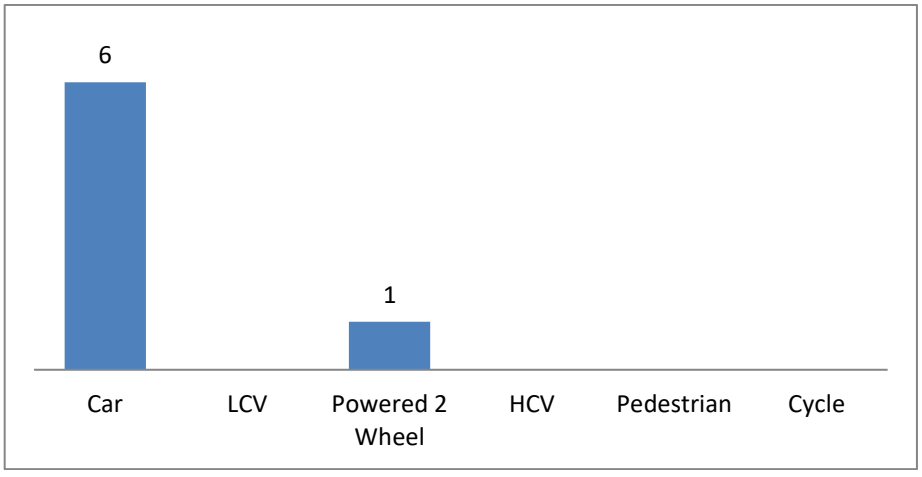


Figure 3.7.2 – Mode of Transport involved in Collisions.

3.7.7 The information contained in the collision data has been compared to national averages obtained from the DfT publication "Road Casualties in Great Britain" (RCGB), 2019 in **Figures 3.7.3** to **3.7.5** below.

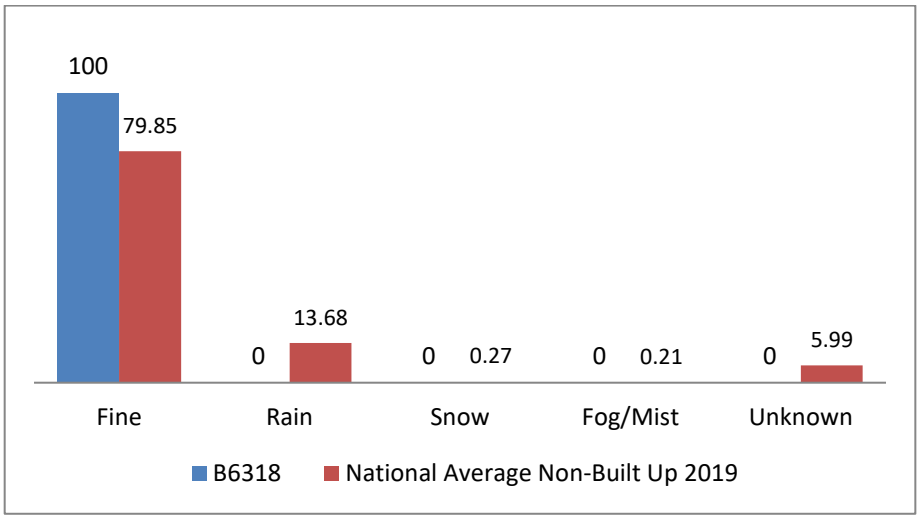


Figure 3.7.3 – Percentage Collisions by Weather Conditions.

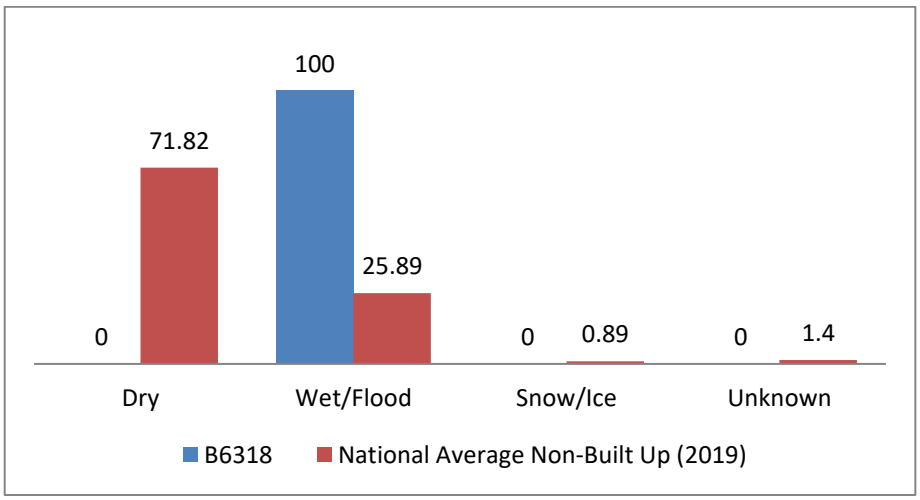


Figure 3.7.4 – Percentage Collisions by Road Surface Conditions.

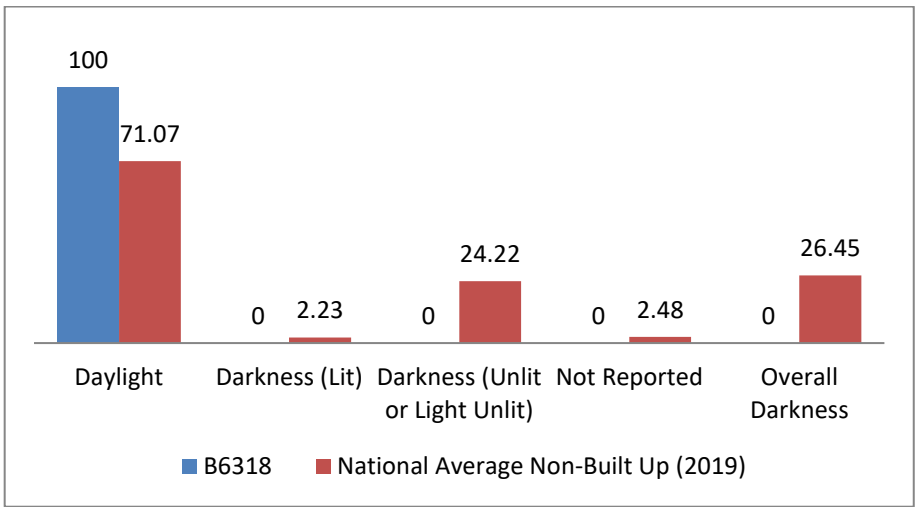


Figure 3.7.5 – Percentage Collisions by Lighting Conditions.

3.7.8 The above table's show that collisions on a wet road surface were well above National norms.

3.7.9 Details of the time of day, day of week and month of year during which collisions occurred are shown in **Figures 3.7.6** to **3.7.8** below.

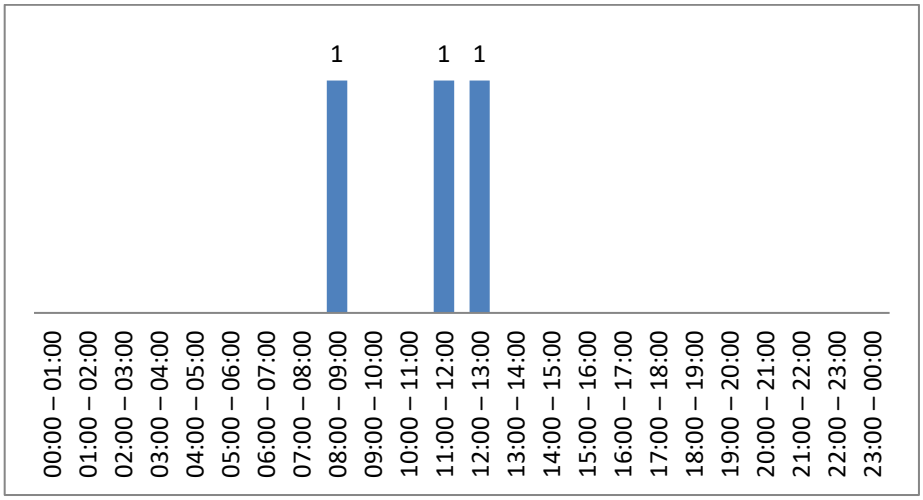


Figure 3.7.6 – Collisions by Time of Day

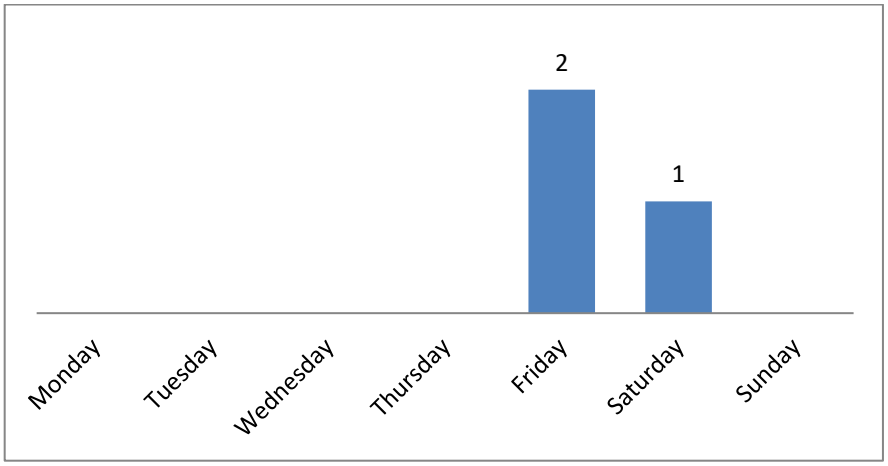


Figure 3.7.7 – Collisions by Day of Week

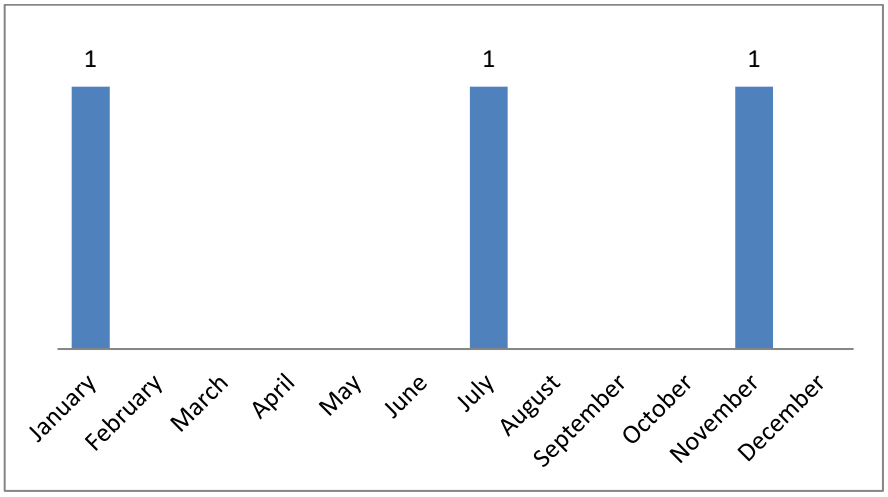


Figure 3.7.8 – Collisions by Month of Year

3.7.10 Most collisions occurred in the daytime inter-peak, towards the end of the week and during Winter months

Collisions By Time of Day (%)	
AM Peak (06:00 – 10:00)	*33*
Inter Peak (daytime)	*67*
PM Peak (15:00 – 18:00)	*0*
Off Peak (evening)	*0*

Collisions By Time of Year (%)	
Spring (Mar to May)	*0*
Summer (June to Aug)	*33*
Autumn (Sept to Oct)	*0*
Winter (Nov to Feb)	*67*

3.8 Section 5 – Halton Shields to A68 Roundabout

Period		Collisions				Casualties			
		Slight	Serious	Fatal	Total	Slight	Serious	Fatal	Total
	2019	0	0	0	**0**	0	0	0	**0**
	2020	2	1	0	**3**	2	1	0	**3**
	2021	0	0	0	**0**	0	0	0	**0**
	Total	2	1	0	**3**	2	1	0	**3**

Table 3.8.1 – Total Collisions and Casualties

3.8.1 **Table 3.8.1** above indicates that during this time period two slight and one serious personal injury collision was recorded within the extents of the scheme collision data search area. Three casualties resulted from the three collisions, an average of 1.0 casualty per collision.

3.8.2 **Table 3.8.2** below shows a summary of the average number of collisions/casualties over the full 36-month period, together with severity ratios.

36-month Coll's/yr	KSI Collision Severity Ratio	36-month Cas/yr	KSI Casualty Severity Ratio
1.0	33%	1.0	33%

Table 3.8.2 – Total Collisions and Casualties

3.8.3 **Table 3.8.3** below shows the direction of travel for all collisions.

Direction of Travel	Total	%
Eastbound	0	*0*
Westbound	3	*100*
Total	**3**	***100***

Table 3.8.3 – Direction of Travel

3.8.4 **Table 3.8.4** below shows the details of collisions where the description mentions the presence of a bend or close proximity of a junction, at the location of the collision.

Direction of Travel	Right Hand Bend	Left Hand Bend	Junction
Eastbound	0	0	0
Westbound	0	1	2
Total	**0**	**1**	**2**

Table 3.8.4 – Collisions on a bend or at a junction

3.8.5 The collision types are classified in **Figure 3.8.1** below.

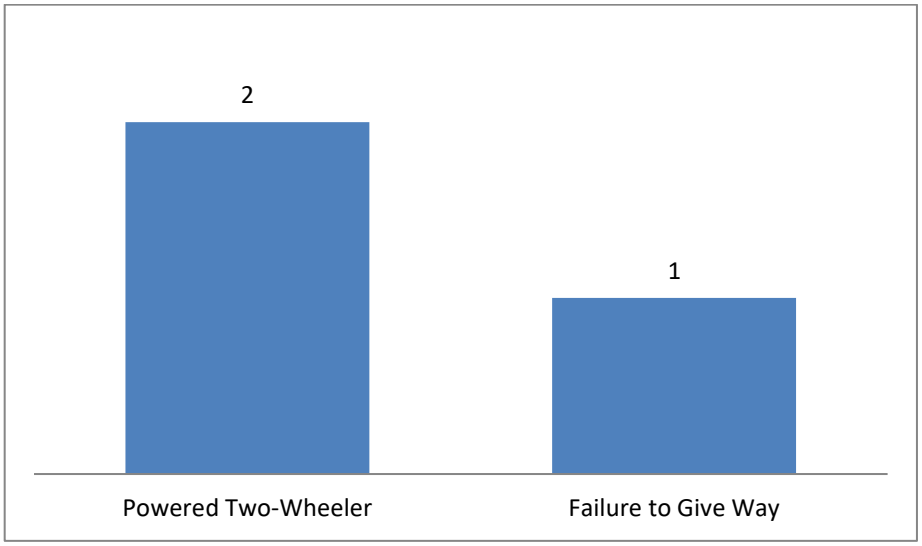


Figure 3.8.1 – Collisions by Type

3.8.6 The mode of transport, involved in the collisions recorded, is classified in **Figure 3.8.2** below. An average of 1.67 modes of transport were involved in each collision, with the predominant vehicle type involved being the car and powered two wheeler (both 40%).

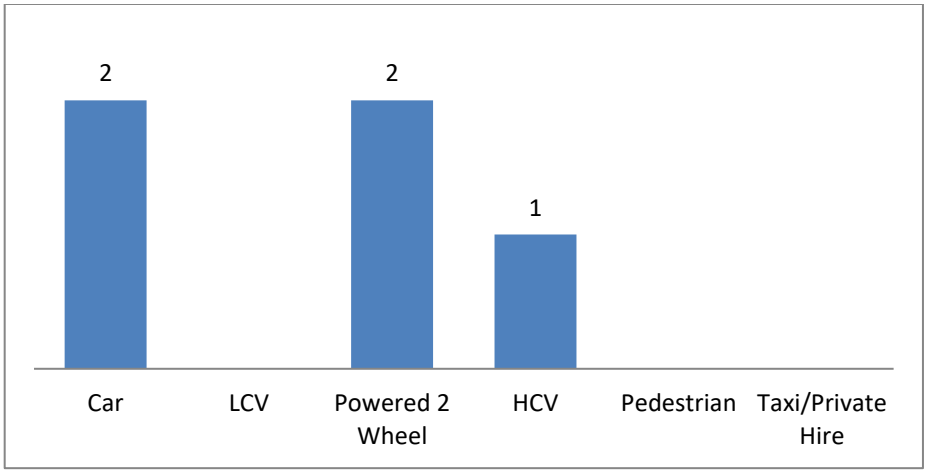


Figure 3.8.2 – Mode of Transport involved in Collisions.

3.8.7 The information contained in the collision data has been compared to national averages obtained from the DfT publication "Road Casualties in Great Britain" (RCGB), 2019 in **Figures 3.8.3** to **3.8.5** below.

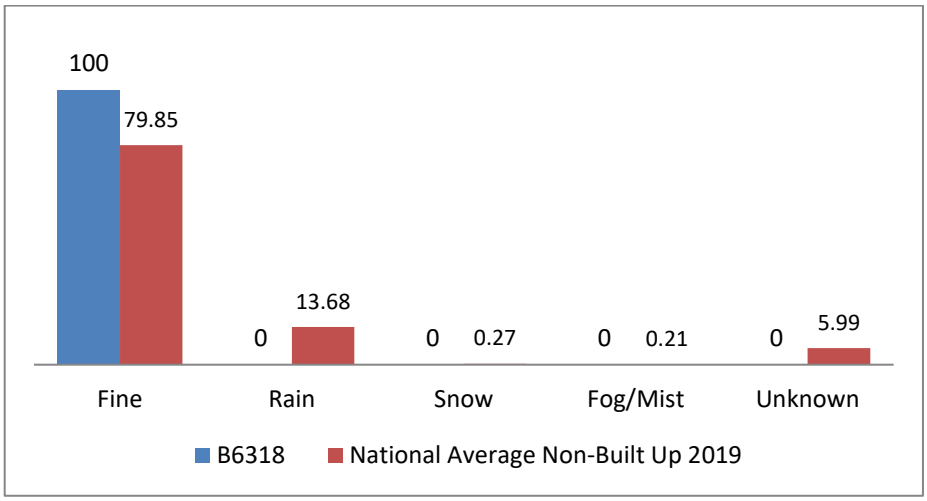


Figure 3.8.3 – Percentage Collisions by Weather Conditions.

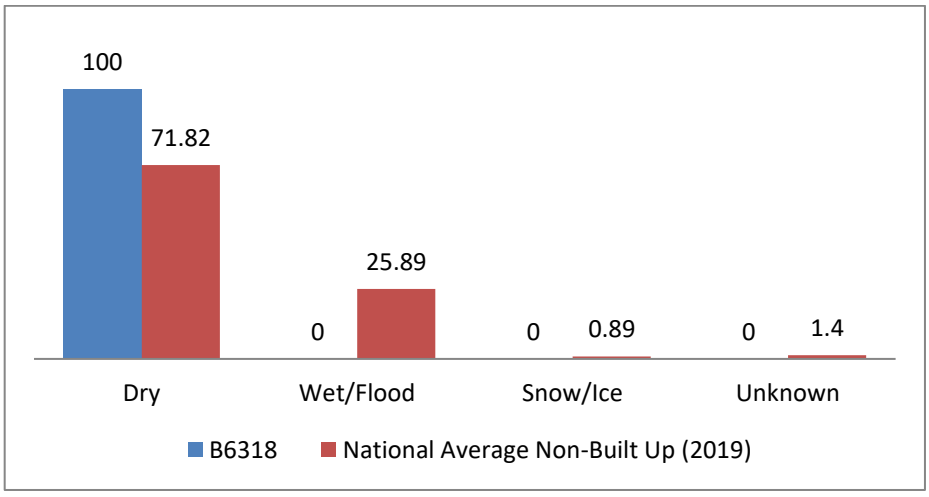


Figure 3.8.4 – Percentage Collisions by Road Surface Conditions.

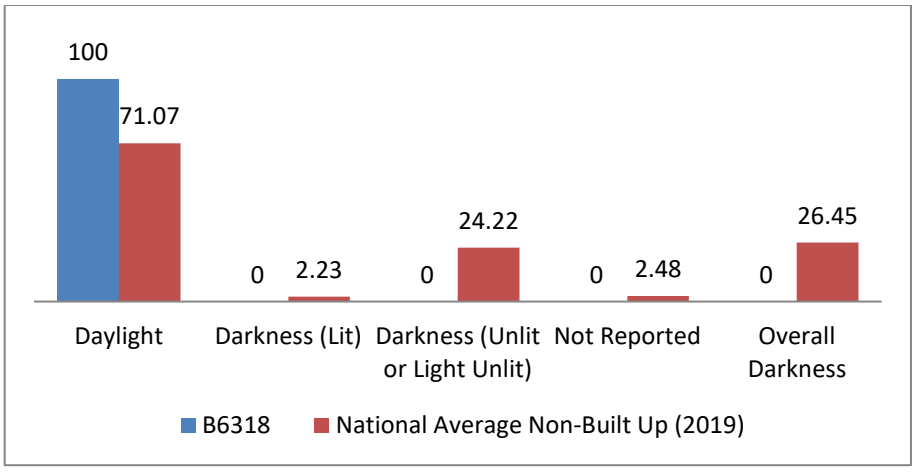


Figure 3.8.5 – Percentage Collisions by Lighting Conditions.

3.8.8 The above table's show that collisions during adverse conditions were well below National norms.

3.8.9 Details of the time of day, day of week and month of year during which collisions occurred are shown in **Figures 3.8.6** to **3.8.8** below.

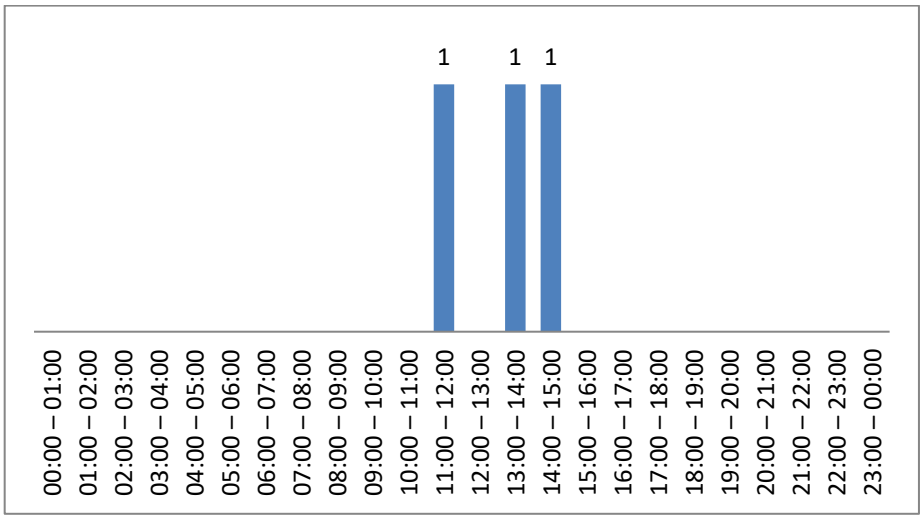


Figure 3.8.6 – Collisions by Time of Day

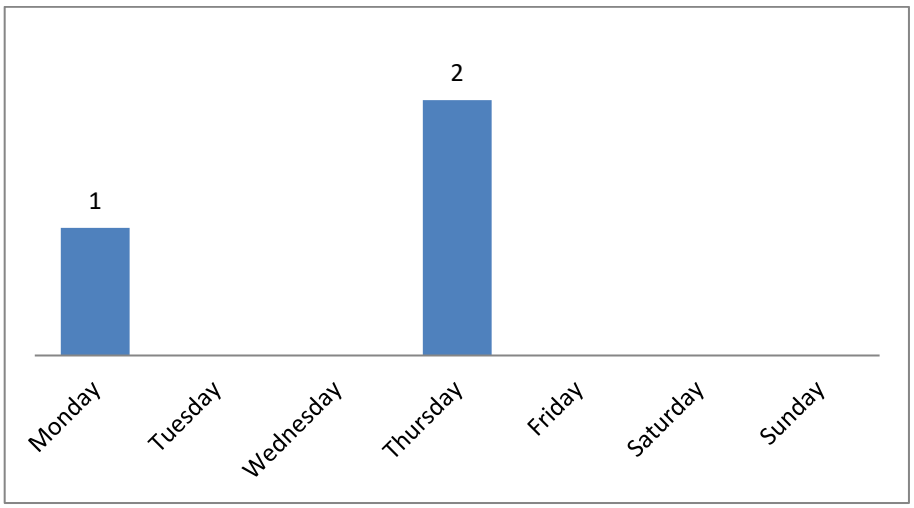


Figure 3.8.7 – Collisions by Day of Week

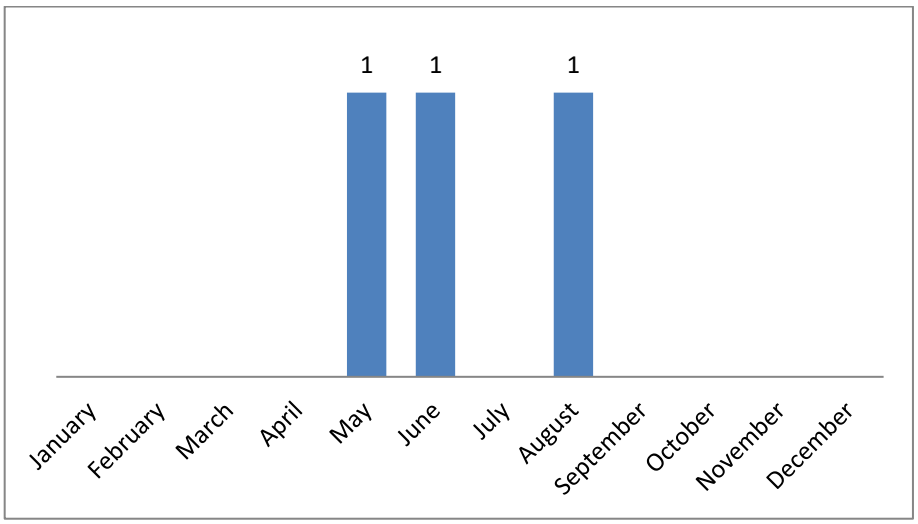


Figure 3.8.8 – Collisions by Month of Year

3.8.10 The majority of collisions occurred during the daytime Inter Peak period and during the Summer months.

Collisions By Time of Day (%)	
AM Peak (06:00 – 10:00)	*0*
Inter Peak (daytime)	*100*
PM Peak (15:00 – 18:00)	*0*
Off Peak (evening)	*0*

Collisions By Time of Year (%)	
Spring (Mar to May)	*33*
Summer (June to Aug)	*67*
Autumn (Sept to Oct)	*0*
Winter (Nov to Feb)	*0*

3.9 Traffic Volume & Speeds

3.9.1 During 2022 new traffic volume data was obtained through the undertaking of one week surveys within each of the five route sections. This data has been applied to each section of the route under consideration, to produce a collision rate for each section as shown in the tables which follow.

3.9.2 Traffic speed data (85th percentile and mean), for the individual traffic count locations is shown below, however this data applies to a specific location and vehicle speeds will vary throughout each section based upon speed limits and the carriageway alignment present.

Section Number	Name	24h AADT Two-way
1	Heddon-on-the-Wall to Hollins Hill	2631
2	Hollins Hill to Harlow Hill	2969
3	Harlow Hill to West Deneside	5486
4	West Deneside to Halton Shields	5353
5	Halton Shields to A68 Roundabout	2740

Table 3.9.1 – AADT by section

Section Number	Name	85th %ile EB mph	85th %ile WB mph
1	Heddon-on-the-Wall to Hollins Hill	43	44
2	Hollins Hill to Harlow Hill	56	57
3	Harlow Hill to West Deneside	63	63
4	West Deneside to Halton Shields	62	60
5	Halton Shields to A68 Roundabout	61	62

Table 3.9.2 – 85th Percentile speeds by section

Section Number	Name	Mean EB mph	Mean WB mph
1	Heddon-on-the-Wall to Hollins Hill	37	38
2	Hollins Hill to Harlow Hill	47	49
3	Harlow Hill to West Deneside	55	55
4	West Deneside to Halton Shields	54	52
5	Halton Shields to A68 Roundabout	54	54

Table 3.9.3 – Mean speeds by section

3.10 Site Visit

3.10.1 Kevin Brown and John Mather visited the site together during daylight on Thursday 1 December 2022 between 11:00 and 12:25 hours (the route was driven first westbound then eastbound with Dash Cam video footage taken throughout). The weather was overcast/cold, and the road surface was wet/damp during the site visit. The video footage was later viewed jointly on a TV screen at County Hall, Morpeth on Tuesday 7 February 2023, with discussions taking place along the route.

3.10.2 Traffic flows were observed to be moderate/low during the site visit, on Thursday 1 December 2022.

3.11 Road Surface Condition

3.11.1 No route wide SCRIM survey skid resistance data was available for the B6318; however, it was observed that significant lengths of the route had been resurfaced or surface dressed in recent years.

3.11.2 A SCRIM survey has been requested for the length of B6318 carriageway (both directions) within the study area and this will be utilised when developing improvements for the individual route section in future years.

3.12 Traffic Signs

3.12.1 Six situations were evident during the course of the site visit as follows:

- There are several existing warning signs where clear visibility distance of the sign is reduced through the presence of vegetation located in advance of the sign;
- Centre line, road stud and edge line road markings are in poor condition at some locations;
- There are several warning/directional signs either in poor condition visually, with the sign face obscured by detritus or signs may be missing;
- An opportunity exists to rationalise use of warning signs with appropriate supplementary plate information and coloured backing board; and
- Advance give way warning and directional signage improvements could be made on both the main road and side roads at junctions.

3.13 Comparison of Key Data

3.13.1 The tables below provide comparisons of key data across all five sections of the route in order to highlight potential priority route sections where remedial measures could be undertaken.

3.13.2 Traffic volume and collision data has been applied to the five sections of the route under consideration, to produce a collision rate for each section as shown in **Table 3.13.1** below. **Section 2** and **Section 1** are shown to have the highest collision rates respectively.

Section Number	24h AADT Two-way	Total Collisions (3 Year)	Length (km)	Collision Rate (per 100 million vehicle km)
1	2631	3	*3*	***35***
2	2969	7	*3*	***72***
3	5486	4	*3*	***17***
4	5353	2	*3*	***17***
5	2740	3	*3*	***33***

Table 3.13.1 – Collision Rate (per 100 Million Vehicle km) by section

3.13.3 The variables used in **Table 3.13.1** to derive the collision rate are summarised in the formula below:

$$\frac{\text{Total no. of PIC's x } 10\text{^}8}{\text{Days of Year x No. of years data x length of road (km) x Annual Average Daily Traffic (AADT) Flow}}$$

3.13.4 Example for **Section 1**

$$\frac{3 \text{ x } 10\text{^}8}{365 \text{ x } 3 \text{ x } 3.0 \text{ x } 2631} = \textbf{\textit{35}}$$

3.13.5 Analysis shown in **Table 3.13.2** below indicates that **Section 2** experienced the highest collisions per year. **Section 2, Section 1, Section 5** and **Section 4** are shown to have the highest KSI casualty severity ratios.

Section Number	Collisions per Year	KSI Collision Severity Ratio	Casualties per Year	KSI Casualty Severity Ratio
1	1.0	0.33	2.0	0.33
2	2.33	0.43	4.0	0.42
3	1.0	zero	1.67	zero
4	1.0	0.67	1.33	0.50
5	1.0	0.33	1.0	0.33

Table 3.13.2 – Collisions, Casualties and Severity per year by section

3.13.6 Analysis shown in **Table 3.13.3** below indicates that only some collisions in **Section 1** and **Section 2** occurred during darkness hours.

Section Number	% Daylight	% Darkness (lights lit)	% Darkness (unlit)	% Darkness (combined)
1	67	*0*	*33*	*33*
2	57	*0*	*43*	*43*
3	100	*0*	*0*	*0*
4	100	*0*	*0*	*0*
5	100	*0*	*0*	*0*

Table 3.13.3 – Collisions by lighting conditions by section.

3.13.7 Analysis shown in **Table 3.13.4** below indicates that **Section 3** experienced the highest proportion of collisions during AM Peak period. **Section 2** experienced the highest proportion of collisions during PM Peak period. **Section 5** experience the highest proportion of collisions during daytime inter peak period with **Section 2** showing higher numbers in the night time off peak period.

Section Number	% AM Peak 07:00 to 10:00	% PM Peak 15:00 to 18:00	% Inter Peak 10:00 to 15:00	% Off Peak
1	*0*	*33*	*33*	*33*
2	*0*	*43*	*14*	*43*
3	*67*	*33*	*0*	*0*
4	*33*	*0*	*67*	*0*
5	*0*	*0*	*100*	*0*

Table 3.13.4 – Percentage collisions by time of day and section

3.13.8 **Table 3.13.5** ranks the six route sections in order of highest to lowest based on the collision rate per 100 million vehicle Km.

Rank	Section	Route Section Number	No. of Collisions (36 months)			Total No of PIC's	Collision Rate Per 100 MvKm	KSI Collision Ratio	Predicted FYRR
			Fatal	Serious	Slight				
1	Hollins Hill to Harlow Hill	**2**	0	3	4	**7**	***72***	0.43	367 %
2	Heddon-on-the-Wall to Hollins Hill	**1**	0	2	1	**3**	***35***	0.67	157 %
5	Halton Shields to A68 Roundabout	**5**	0	1	2	**3**	***33***	0.33	157 %
3	West Deneside to Halton Shields	**4**	0	2	1	**3**	***17***	0.67	157 %
4	Harlow Hill to West Deneside	**3**	0	0	3	**3**	***17***	zero	157 %

Table 3.13.5 – Sections shown by Rank and Rate by Section including FYRR

3.13.9 This allows the sections to be categorised as follows:

HIGHEST PRIORITY

- Section 2 - Hollins Hill to Harlow Hill
- Section 1 – Heddon-on-the-Wall to Hollins Hill

MEDIUM PRIORITY

- Section 5 – Halton Shields to A68 Roundabout
- Section 4 - West Deneside to Halton Shields

LOWER PRIORITY

- Section 3 – Harlow Hill to West Deneside

3.14 First Year Rate of Return (FYRR)

3.14.1 **Table 3.13.5** shows predicted collision savings per year (FYRR) for each individual section.

3.14.2 These figures are calculated based on the following:

- Average cost of a collision on a Non Built-Up road (RCGB, 2021 – Table RAS60002 – 2021 Prices) = **£190,394**;
- Proposed spend per section = **£40,000 -** D*epending on the scale of works to be undertaken on each individual section some sections may cost more than £40,000 and others less than £40,000, however the indicative figure provided is considered to be a suitable indicative overall cost for evaluation purposes*;
- Predicted annual collision savings as a result of the implemented scheme = **33%** (typical collision saving return from warning sign and road marking type schemes);
- *Example **(Section 1)***
    - *3 year collisions = 3*
    - *Collisions per year – 3/3 = 1.0*
    - *Predicted savings – 1.0 x 0.333 = 0.33*
    - *0.33 x £190,394 = £76,158*
    - *£76,158/£40,000 x 100 = **157% (FYRR)***

3.14.3 This illustrates that all of the five sections are predicted to provide first year rates of return (FYRR) between 367% and 157%.

3.14.4 Undertaking work on route **Section's 1, 2, 3, 4 and 5** therefore demonstrates a significant return on investment.

4 Options Review

4.1 Overview

4.1.1 Following interrogation of the STATS 19 collision records along the route, for the period 1 January 2019 to 31 December 2021, the main factors relevant to the collisions recorded are considered to be as follows:

- A higher KSI collision severity ratio of 42%, compared to the National Average (RCGB, 2019) of 31% for All Rural Roads;
- Powered two wheeler (27%); failure to give way (16%) and loss of control, head-on and right turn (all individually 11%) were the most prevalent types of collision;
- Three (16%) of the overall nineteen collisions listed occurred on bends, ten (52%) occurred in the general vicinity of junctions. Six (32%) occurred on otherwise straight sections of road away from junctions. 42% of the overall collisions occurred on a wet or icy road surface.
- 58% of collisions occurred eastbound, 32% westbound and on approaching side roads, 5% southbound and 5% northbound;
- Adverse weather conditions was not a significant factors in the collisions recorded.
- Collisions on a wet or icy surface and during darkness hours (no lights present) were higher than National norms;
- 4 (21%) of all collisions involved a vehicle skidding.
- The predominant vehicle types involved in recorded collisions were car (71%) and a powered two-wheeler (14%).
- Collisions by the time of year showed that most collisions occurred during Summer (26%) and Winter (36%);
- Collisions by day of the week were quite evenly spread other than a Friday or Monday when 27% and 21% respectively of collisions occurred; and
- 36% of collisions occurred during the (inter-peak) daytime and 27% during the PM peak.

4.1.2 Based upon the desktop study, data analysis and a subsequent site visit the overriding collision causation factors are considered to be as follows:

- Loss of control collisions, primarily on bends;
- Head-on type collisions;
- Right turn collisions at junctions;
- Failure to give way collisions;
- Collisions involving powered two wheelers;
- Collisions on a wet or icy road surface; and
- Collisions during darkness hours.

4.2 Available Remedial Measures

4.2.1 The main types of collision remedial measures considered to be appropriate for this route, to address the problems identified, are as follows:

- Enhancement of the existing provision of bend warning and junction warning signs (including yellow backing board, advisory speed limit and reduce speed now supplementary plates where necessary) to provide consistent provision throughout the route;
- Improved directional and advanced directional signing where appropriate;
- New or enhanced “chevron” warning signs or marker posts where appropriate;
- General road marking improvement (evaluation of extents of double white line, “SLOW” and edge lines for example);
- Use of red surface treatment or HFS surfacing where warranted;
- Provision of marker posts to identify accesses where appropriate;
- Improved give-way signage at junctions (main road and side roads) where required; and
- Vegetation clearance to improve clear visibility of existing directional and warning sign faces.

4.2.2 Additionally, although less relevant to road safety, in comparison with the above measures, the following works may also be beneficial when undertaking packages of works

- Replacement of weathered signs (although this should be a function of the maintenance regime); and
- Upgrading of any non-complaint blue bordered direction signs which remain.

4.2.3 The undertaking of significant improvement works, under systems of traffic management also affords an opportunity for routine maintenance tasks to be undertaken, which may have added road safety benefits. For example, gully cleansing, vegetation clearance and channel clearance.

4.2.4 Examples of conditions present along the route are shown below.

Photo 1 - Example of bend which could benefit from improved advanced warning, refreshed road markings/studs and red surface strips

Photo 2 - Example worn roadmarkings/studs approaching a bend and potential to improve conspicuity of chevron signs located at the bend.

Photo 3 - Example of use of yellow backing board and reduce speed now supplementary plate with SLOW road marking/with red strips.

Photo 4 - Example of undulating section of road which may benefit from Hidden Dip warning signs.

Photo 5 - Example of bend warning sign which may benefit from being located on yellow backing board with a speed reminder.

Photo 6- Example of location where enhanced chevron signing on bend may be beneficial along with road marking/stud refreshement.

Photo 7- Example of location where enhancement of the warning sign, with a supplementary distance plate may be beneficial.

Photo 8 - Example of bend warning sign which could benefit from an appropriate reduced speed supplementary plate

Photo 9 – Chevron sign is hidden within vegetation – suitable clearance required and sign enahnaced on yellow backing board.

Photo 10 – Warning sign twisted to face in wrong direction and sign may benefit benefit from an appropriate reduced speed supplementary plate

Photo 11 – Ensure termination of double white line system is located correctly, opportunity to enhance junction warning sign and provide SLOW roadmarkings and red surface strips.

Photo 12 - Example of worn sign and SLOW road markings which can be improved.

Photo 13 – Worn stack type advanced direction sign which has slipped on posts. Opportunity to improve advanced signage and provide SLOW road markings and red strips.

Photo 14 - Worn junction warning sign which can be improved and opportunity to provide SLOW road markings and red strips.

Photo 15 – Warning sign face is badly worn and requires replacement and sign is twisted to face in the wrong direction.

Photo 16 - Example of advanced direction obscured by vegetation.

Photo 17 - Warning sign face is badly worn and requires replacement

Photo 18 – Example of use of yellow backed junction warning sign with supplementary distance plate.

Photo 19 – Example worn set of road markings/studs alongside other markings which have been refreshed more recently.

Photo 20 – Example of staggered junction warning sign which could have improved consipuity and a supplementary distance plate.

Photo 21 - Example of use of marker posts to highlight presnce of minor side road junction.

Photo 22 – Incorrect signage in place for a location where pedestrians cross.

Photo 23 - Example of use of double banked double bend warning signs with advisory speed limit supplementary plate.

Photo 24 – Missing warning sign (vacant post) in advance of a section of road with non standard verical and horizontal alignment.

Photo 25 - Missing warning sign (vacant post).

Photo 26 – Badly worn double bend warning sign. Sign and supplementary plate could be enahanced on yellow backing board

Photo 27 – Chevron sign has been dislodge and is facing the wrong way – should be directing traffic left around the bend.

Photo 28 – Incorrect signage in place for a location where pedestrians cross.

Photo 29 - Example of indistinct road markings beyond another section of road markings which have been refreshed more recently.

Photo 30 – Twisted supplementary plate and worn SLOW road markings and centre line road markings.

Photo 31 – Warning sign has been twisted to face wrong direction and sign appears worn

Photo 32 - Example of crossroads warning sign which could be enhanced on yellow backing board with a supplementary distance plate

Photo 33 - Example of use of yellow backed warning sign with advisory speed limit. Note however that the advisory speed limit conflicts with the 40mph speed limit terminal signs a short distance ahead.

Photo 34 – Check that termination of double white lines and start of broken line is located correctly on an undulating section of road.

Photo 35 - Warning sign has been twisted to face wrong direction

Photo 36 - Example of worn warning sign which could be replaced and enhanced.

Photo 37 – Yellow back crossroads warning sign has slipped on existing post.

Photo 38 - Example of indistinct road markings beyond another section of road markings which have been refreshed more recently.

Photo 39 - Example of waring sign and chevron sign in advance of and at bend which could be enhanced and provided with SLOW road markings and red strips and refreshed markings and studs.

Photo 40 – Chevron "target" signs installed incorrectly. Left chevron should face left or location may appear to be a right bend from a distance.

Photo 41 – Advanced stack type advanced direction sign which requires replacement and which could be re-designed to be map type showing the junction layout ahead and provided with SLOW markings and red strips.

Photo 42 – Advance junction warning sign could be enahanced and provided with SLOW markings and red strips.

4.3 Indicative Costs of Remedial Measures

4.3.1 At this stage detailed individual costs of works packages for individual sections have not been calculated as budget allocations and exact phasing of works are unknown. **Table 4.3.1** below however, provides indicative costs of the collision remedial measure types deemed suitable to address collisions on this route.

Measure	Per	Indicative Cost Estimate
Disposal of traffic signs plate only	Unit	£75.00
Disposal of traffic signs including posts	Unit	£150.00 - £200.00
Disposal of marker posts	Unit	£30.00
Disposal of road studs (shoe and reflector)	Unit	£5.50
Disposal of road studs (reflector only)	Unit	£4.50
New Warning Sign mounted on new posts	Unit	£500-£750
New Warning Sign mounted on existing posts	Unit	£250-£500
New Direction Sign on new posts	Unit	£600-£1200
New Direction Sign on existing posts	Unit	£500-£700
New Marker Posts	Unit	£50.00
Road Marking Gang –Shift	Shift/Site	£1200.00 min
New Red Surface Treatment Strips	Sq M	£19.75
New Road Studs (shoe and reflector)	Stud	£17.50
New road studs (reflector only)	Unit	£4.50
Vegetation Clearance	Per Site	£350.00

Table 4.3.1 – Indicative Costs of Proposed Collision Remedial Measures

4.3.2 The above indicative costs do not include elements for Design (approximately 15%), Supervision (approximately 5%), Risk (approximately 10%) and any diversions required for utilities (although these are not anticipated given the nature of the proposed measures) or Traffic Management (as discussed below).

4.3.3 An indication of potential phased annual budget allocations would allow a more detailed (and costed) works programme to be established.

4.4 Traffic Management Requirements for works on Principal Roads

4.4.1 The nature of this route (mix of rural speed limits on single carriageway, which is unlit) will require appropriate traffic management in accordance with TSM Chapter 8.

4.4.2 Evidence from recent route action schemes, undertaken on the A697, A696, A68, A1068 and B6320 in Northumberland, indicate that Traffic Management costs have been as follows:

- Two-way traffic lights - £300 per individual location; and
- Convoy working to cover road marking installation - £900 per individual location.

4.4.3 However, any future route action works undertaken, as a result of this study, will require individual costing of Traffic Management requirements based upon the exact nature of works proposed.

4.5 High Priority Route Sections

4.5.1 **Table 4.5.1** below sets out high priority route sections, along with problems identified and recommended intervention measures. The route section numbers considered to lie within the High Priority category are:

- **Section 2 -** Hollins Hill to Harlow Hill (**RANK 1**); and
- **Section 1** – Heddon-on-the-Wall to Hollins Hill (***RANK 2***).

HIGH PRIORITY		
Option Ref	**Route Section**	**Proposed Intervention Measures**
1.1	**2**	General warning signing and road marking/road stud improvements/ refreshment particularly focussing on **Iron Sign Farm Crossroads** and **bends and crests between Iron Sign Farm Crossroads and north of Northside Farm.**
1.2	**1**	General warning signing and road marking/road stud improvements/ refreshment particularly focussing on **bends East and West of A69(T), Rudchester Crossroads** and **Eastbound approach to B6318/B6528 junction in Heddon-on-the-Wall**

Table 4.5.1 – Potential Remedial Measures in High Priority Route Sections

4.6 Medium Priority Route Sections

4.6.1 **Table 4.6.1** below sets out medium priority route sections, along with problems identified and recommended intervention measures. The route section numbers considered to lie within the Medium Priority category are:

- **Section 5 –** Halton Shields to A68 Roundabout **(RANK 3);** and
- **Section 4 –** West Deneside to Halton Shields **(RANK 4)**

MEDIUM PRIORITY		
Option Ref	**Route Section**	**Proposed Intervention Measures**
2.1	**5**	General warning signing and road marking/road stud improvements/ refreshment particularly focussing on **bends East of Halton Red House**
2.2	**4**	General warning signing and road marking/road stud improvements/ refreshment particularly focussing on **various junctions in vicinity of Wallhouses**

Table 4.6.1 – Potential Remedial Measures in Medium Priority Route Sections

4.7 Lower Priority Route Sections

4.7.1 **Table 4.7.1** below sets out lower priority route sections, along with problems identified and recommended intervention measures. The route section numbers considered to lie within the Low Priority category are:

- **Section 3 –** Harlow Hill to West Deneside (***RANK 5***).

LOWER PRIORITY		
Option Ref	**Route Section**	**Proposed Intervention Measures**
3.1	**3**	General warning signing and road marking/road stud improvements/ refreshment particularly focussing on **B6318/B6309 Crossroads and approaches.**

Table 4.7.1 – Potential Remedial Measures in Lower Priority Route Sections

4.7.2 The improvements identified above will be subject to more detailed evaluation upon the identification of funding sources to enable implementation of collision remedial measures. The extent of works which can be undertaken will therefore be dependent on the level of funding made available.

4.7.3 Experience of works undertaken on the B6320, A1068, A68, A696 and A697 in Northumberland, in recent years, following the undertaking a Route Study report for those roads in 2021, 2020, 2019, 2018 and 2014 respectively, indicates that

- **an allocation of £40,000 per route section** can allow the implementation of significant traffic sign, road marking and vegetation clearance. Depending on the scale of works to be undertaken on each individual section some sections may cost more than £40,000 and others less than £40,000, however the indicative figure provided is considered to be a suitable indicative overall cost for evaluation purposes.

5 Key Findings & Recommendations

5.1 Collision Totals

5.1.1 During the study period the total number of collisions occurring on the whole route is 19 (averaging 6.3 per year) with 28 casualties resulting from those collisions (an average of 9.33 casualties per year and 1.47 casualties per collision). The killed and seriously injured (KSI) severity ratio for collisions is 0.42 and for casualties is 0.32.

5.2 Collision Types

5.2.1 Throughout the whole route the most prevalent collision types were powered two wheeler (27%); failure to give way (16%) and loss of control, head-on and right turn (all individually 11%).

5.2.2 Three (16%) of the overall nineteen collisions listed occurred on bends, ten (52%) occurred in the general vicinity of junctions. Six (32%) occurred on otherwise straight sections of road away from junctions. 42% of the overall collisions occurred on a wet or icy road surface.

5.2.3 An average of 1.8 modes of transport were involved in each collision with the predominant vehicle types involved being a car (71%) and a powered two-wheeler (14%).

5.3 Priority Ranking

5.3.1 The five 3km sections have been ranked in order of highest to lowest collision rate per million vehicle Km. This allows the sections to be categorised as follows:

HIGHEST PRIORITY

- Section 2 - Hollins Hill to Harlow Hill
- Section 1 – Heddon-on-the-Wall to Hollins Hill

MEDIUM PRIORITY

- Section 5 – Halton Shields to A68 Roundabout
- Section 4 - West Deneside to Halton Shields

LOWER PRIORITY

- Section 3 – Harlow Hill to West Deneside

5.4 Collision Clusters

5.4.1 Evaluation of the collision data for the route did not identify locations meeting typical cluster site criteria (3 or more collisions in the last three year period). It was also observed that significant sections of the route had been resurfaced or surface dressed recently, providing a safety benefit. Evidence of previous High Risk Site treatments were also observed along the route.

5.4.2 As such, although there are locations where two or less collisions have occurred at the same general location, collisions are spread out along the route at locations with similar hazard types (changes in vertical and horizontal alignment of the road and at junctions).

5.4.3 Notwithstanding the above, general locations which may benefit from specific treatments in each individual section are as follows:

- Iron Sign Farm Crossroads and bends and Iron Sign Farm Crossroads and north of Northside Farm (**Section 2**);
- Bends East and West of A69(T), Rudchester Crossroads and Eastbound approach to B6318/B6528 junction in Heddon-on-the-Wall (**Section 1);**
- Bends East of Halton Red House (**Section 5**);
- Various junctions in vicinity of Wallhouses (**Section 4**); and
- B6318/B6309 Whittle Dene Crossroads and approaches (**Section 3**)

5.4.4 In addition to this, the scope for improved signing, road marking and vegetation clearance works to take place generally within each route section has been identified.

5.5 Weather, Road Surface and Lighting Conditions

5.5.1 Analysis of the whole route showed that adverse weather conditions were not significant factors in the collisions recorded. Collisions on a wet or icy surface and during darkness hours were above National norms.

5.6 Time of Day, Day of Week and Month of Year

5.6.1 Throughout the whole route the following is evident:

- Collisions by the time of year showed that most collisions occurred during Summer (26%) and Winter (36%);
- Collisions by day of the week were quite evenly spread other than a Friday and Monday when 26% and 21% respectively occurred; and
- 36% of collisions occurred during the (inter-peak) daytime and 27% during the PM peak.

5.7 Traffic Signs

5.7.1 Seven situations were evident during the course of the site visit as follows:

- An opportunity exists to rationalise bend warning sign provision throughout the route including provision of appropriate supplementary plate (i.e., REDUCE SPEED NOW or an Advisory Speed limit and coloured backing board).
- The vertical alignment of the route is substandard at several locations introducing bends and crests and would benefit from additional appropriate form of warning;
- Introduction of SLOW road markings, chevron signs or marker posts at bends or marker posts at minor junctions may also be beneficial;
- There are several existing warning signs and direction signs where clear visibility distance of the sign is reduced through the presence of vegetation located in advance of the sign;
- Centre line road markings, and road studs are in poor condition at some locations and no edge line road markings are present;
- There are several warning/directional signs either in poor condition visually, with the sign face obscured by detritus or signs may be missing; and
- Some non-complaint blue bordered direction signs may remain.

5.8 Road Markings and Road Studs

5.8.1 Significant sections of the route have been resurfaced or surfaced dressed recently and therefore road markings on those sections are in generally very good condition. Road stud and carriageway edge line road marking provision throughout the route is inconsistent.

5.8.2 Existing road markings were observed to be in poor condition at several locations throughout route and some improvements could be made in terms of packages of remedial measures undertaken at specific locations.

5.9 Route Maintenance

5.9.1 No route wide SCRIM survey skid resistance data was available for the B6318, routine SCRIM test surveys are undertaken only on "A" class roads in Northumberland. Nevertheless, it is evident that significant lengths of the route have been subject to resurfacing or surface dressing treatment in recent years.

5.9.2 Resurfacing works would fall outside the scope of any collision remedial measures proposed however, this report will be brought to the attention of the Principal Programme Officer (Maintenance) for further consideration in terms of future Principal Roads Maintenance programmes.

5.9.3 A SCRIM survey has been requested for the length of B6318 carriageway (both directions) within the study area and this will be utilised when developing improvements for the individual route section in future years.

5.10 Hadrian's Wall World Heritage Site

5.10.1 The whole extents of the Study Area lies within the Hadrian's Wall World Heritage Site. Any required digging to install new infrastructure would therefore require Scheduled Monument Consent and Archaeological Watching Briefs.

6 Conclusions

6.0 General

6.0.1 This report has been prepared in response to a request, from Northumberland County Council Highways Programme Team to undertake a Route Road Safety Study of the B6318 route Heddon-on-the-Wall-on-the-Wall in the east and A68/B6318 Errington Arms Roundabout in the west.

6.0.2 The scope of the study covers the above section of the B6318, 15 km in all. To aid analysis, the route has been divided into five 3km long route sections (see **Section 2**).

6.0.3 The collisions occurring during the last 36 month period (1 January 2019 to 31 December 2021) has been analysed for both the overall route and then the five individual sections (see **Section 3**). This report has identified the following main collision types and attendant circumstances:

- Loss of control collisions, primarily on bends;
- Head-on type collisions;
- Right turn collisions at junctions;
- Failure to give way collisions;
- Collisions involving powered two wheelers;
- Collisions on a wet or icy road surface; and
- Collisions during darkness hours.

6.0.4 In **Section 3** the five individual route sections have been ranked based on their respective collision rate per 100 Mvkm respectively as follows:

Rank	Section	Route Section Number	Total No of PIC's	Collision Rate Per 100 MvKm	KSI Collision Ratio	Predicted FYRR
1	Hollins Hill to Harlow Hill	**2**	**7**	***72***	0.43	367 %
2	Heddon-on-the-Wall to Hollins Hill	**1**	**3**	***35***	0.67	157 %
5	Halton Shields to A68 Roundabout	**5**	**3**	***33***	0.33	157 %
3	West Deneside to Halton Shields	**4**	**3**	***17***	0.67	157 %
4	Harlow Hill to West Deneside	**3**	**3**	***17***	zero	157 %

Table 6.0.1 – Sections shown by Rank and Rate by Section including FYRR

6.0.5 The study report also offers a range of potential remedial measures deemed appropriate to reduce the individual risks identified within the five sections above which have been allocated to Highest, Medium and Lower priority (see **Section 4** of this report).

6.0.6 **Section 4** summarises the key findings and recommendations of the report and identifies the following remedial measures as being appropriate to address the collision patterns and circumstances evident.

Route Sections by Priority

6.0.7 The route sections considered to lie within the High, Medium & Lower Priority categories are shown below, together with potential remedial measures:

HIGH PRIORITY		
Option Ref	**Route Section**	**Proposed Intervention Measures**
1.1	**2**	General warning signing and road marking/road stud improvements/ refreshment particularly focussing on **Iron Sign Farm Crossroads** and **bends and crests between Iron Sign Farm Crossroads and north of Northside Farm.**
1.2	**1**	General warning signing and road marking/road stud improvements/ refreshment particularly focussing on **bends East and West of A69(T), Rudchester Crossroads** and **Eastbound approach to B6318/B6528 junction in Heddon-on-the-Wall**
MEDIUM PRIORITY		
Option Ref	**Route Section**	**Proposed Intervention Measures**
2.1	**5**	General warning signing and road marking/road stud improvements/ refreshment particularly focussing on **bends East of Halton Red House**
2.2	**4**	General warning signing and road marking/road stud improvements/ refreshment particularly focussing on **various junctions in vicinity of Wallhouses**
LOWER PRIORITY		
Option Ref	**Route Section**	**Proposed Intervention Measures**
3.1	**3**	General warning signing and road marking/road stud improvements/ refreshment particularly focussing on **B6318/B6309 Crossroads and approaches.**

Table 6.0.2 – Potential Remedial Measures Ranked by Priority Route Sections

6.0.8 The scale of works which could be undertaken, should implementation be phased, would depend upon the value of annual allocations made. At this stage detailed individual costs of works packages for individual sections have not been calculated as budget allocations and exact phasing of works are unknown. **Table 4.3.1** of this report, however, provides indicative costs of the collision remedial measure types deemed suitable to address collisions on this route.

6.0.9 Experience of works undertaken on the B6320, A1068, A68, A696 and A697 in Northumberland, in recent years, following the undertaking a Route Studies for those road in 2021, 2020, 2019, 2018 and 2014 respectively, and evaluation of the type and scale of works which may be possible on the B6318, indicates that

- **an allocation of £40,000 per route section** would allow the implementation of significant traffic sign, road marking and vegetation clearance. Depending on the scale of works to be undertaken on each individual section some sections may cost more than £40,000 and others less than £40,000, however the indicative figure provided is considered to be a suitable indicative overall cost for evaluation purposes.

3.14.5 **Table 3.14.5** shows predicted collision savings per year (FYRR) for each individual section. This illustrates that all of the five sections are predicted to provide first year rates of return (FYRR) between 367% and 157%.

6.0.10 It is recommended therefore that collision remedial measures, in line with those outlined above, demonstrate a positive return on investment and should be considered for implementation in a phased programme of work funded from future year LTP Local Safety Schemes programmes.

7 Details of Study Team

ROAD SAFETY STUDY MEMBER

KEVIN BROWN HNC, ENGTECH MICE, MCIHT, MSORSA Signed: 

Senior Traffic Safety Engineer

Design Team - Traffic Dated: 8 February 2023
Technical Services
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ROAD SAFETY STUDY MEMBER

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Traffic Safety Engineer

Design Team - Traffic Dated:… 8 February 2023
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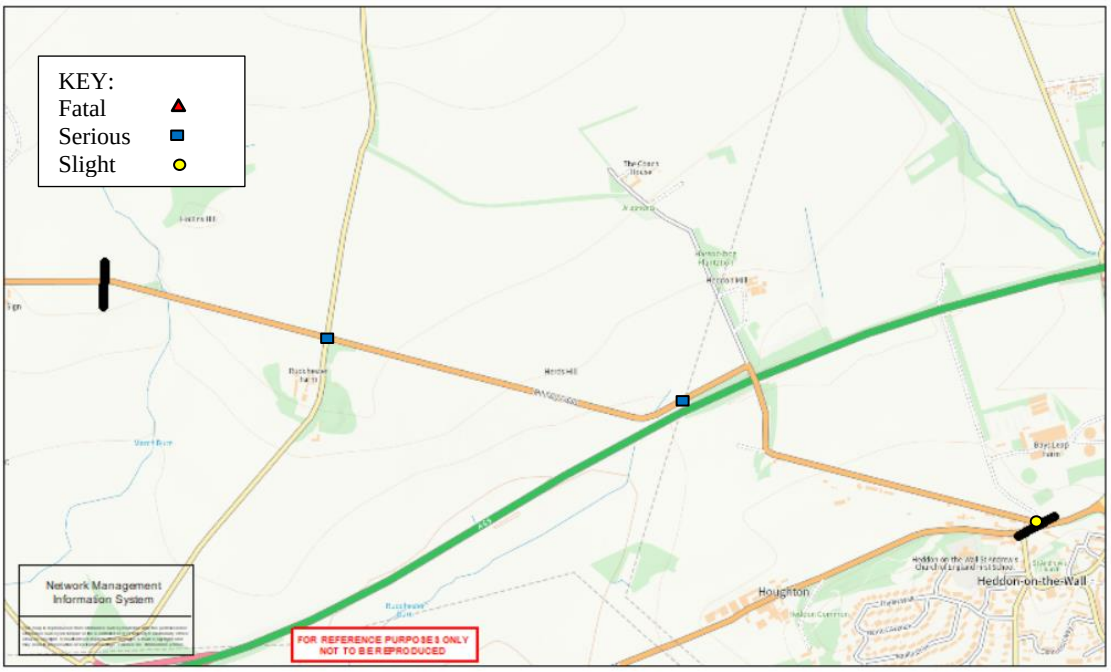
Appendix A

Collision Location Plot

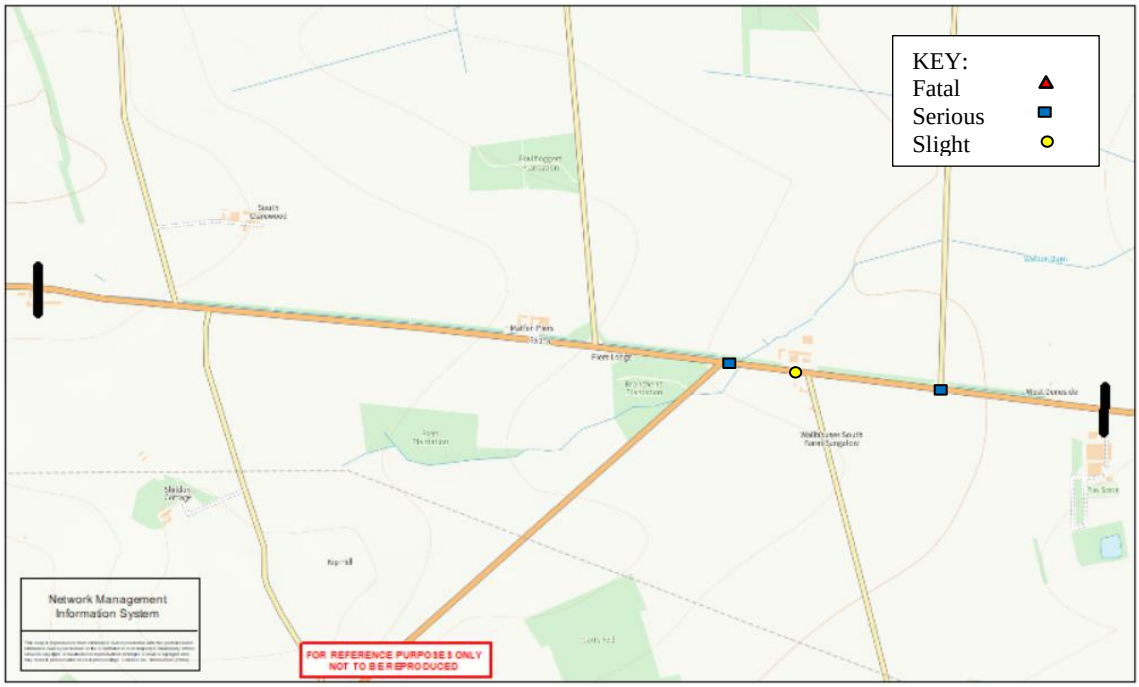
Appendix A



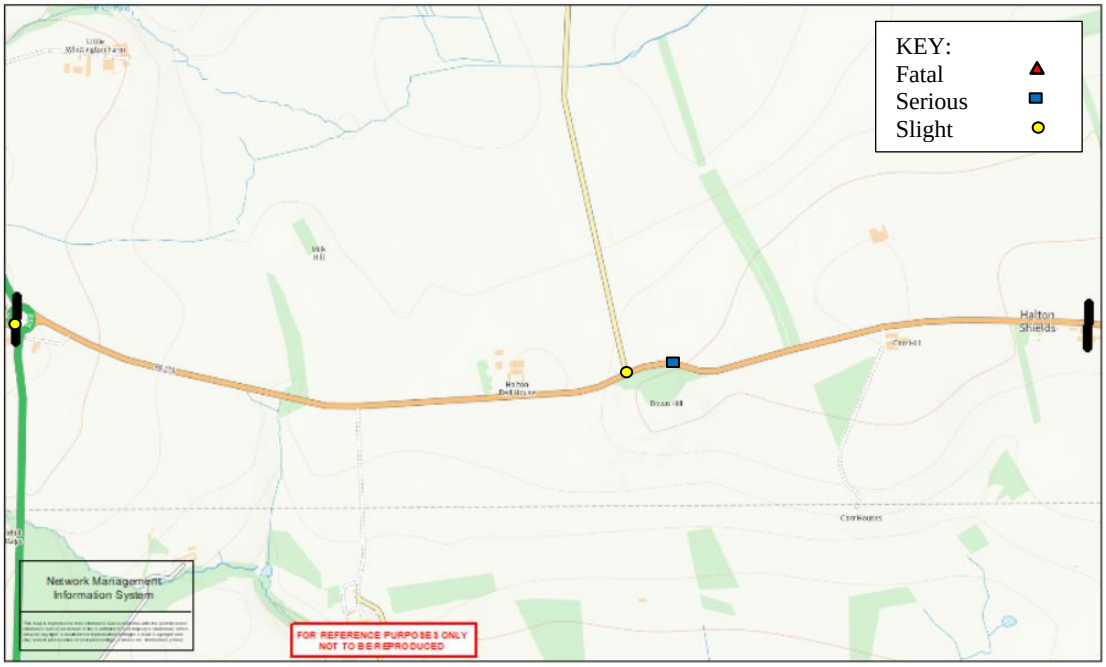
SECTION 1 - Heddon-on-the-Wall to Hollins Hill

SECTION 2 - Hollins Hill to Harlow Hill

SECTION 3 - Harlow Hill to West Deneside



SECTION 4 – West Deneside to Halton Shields



SECTION 5 - Halton Shields to A68 Roundabout

Northumberland
County Council

Technical Services

Design Section