Options Study Report

A41 Route Study
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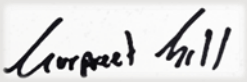
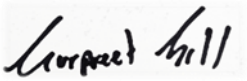
For Information and Client Comment	Name: Mark Gammie Signature: M Gammie Date: 15/01/2024	Name: Henry Hoggarth Signature: Henry Hoggarth Date: 08/02/24	Name: Gurpreet Gill Signature:  Date:08/02/2024
[P02]	Name: Mark Gammie Signature: M Gammie Date: 20/06/2025	Name: Henry Hoggarth Signature: Henry Hoggarth Date: 07/07/2025	Name: Gurpreet Gill Signature:  Date: 07/07/2025
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Executive Summary

Amey has been commissioned by Telford & Wrekin Council (TWC) in partnership with Shropshire Council to carry out a high-level route study of a 26.7-mile section of the A41 between the M54 in the south and Prees Heath roundabout in the north. This report forms the second part of the route study covering the A41. It documents the full findings from a site visit undertaken in September 2023, reviews existing asset information and identifies options for treatments to address the collisions along the route. This report is also accompanied by sketches and drawings for standard arrangements as well as proposed recommendations for cluster sites.

The first part of the route study was a collision analysis technical note using STATS19 collision data. The note firstly looked at whole route trends across the full dataset and secondly at collision cluster site locations previously found and a summary of the findings have been provided. The A41 was found in recent years to have experienced a high rate of fatal incidents compared to the national average with a KSI severity ratio of 31.8% for the A41 against 20.4% nationally showing that collisions on the A41 are significantly more severe. Many collisions were also found to occur at junctions.

Asset information, details of past and future schemes provided by the local authorities has been collated and presented here to contextualise the recent work completed and planned for the route. The A41 has had recent ongoing works involving drainage upgrades, signage upgrades and maintenance. Including the clearing of verges as well as two new cluster sites at Ternhill roundabout and Warrant Road junction that are due for signing improvements.

Additional data has also been provided by Shropshire Council covering recent drainage works, a SCRIM data and from West Mercia Police a summary of speeding offence data. These were then used to carry out analysis and consequently provide conclusions around the level of appropriateness of average speed cameras, allowable skid resistance survey values and potential structural issues for culverts. It has been identified that parts of the route may contain very old culvert structures that should receive investigation to ascertain their existing structural profile as well as a lack of justification for the implementation of safety cameras.

A site visit involving a video recorded drive through of the route was carried out on 28th September and used to provide an overview of the roads existing state and condition as well as a list of identified asset defects such as broken signage, worn road markings, missing studs and poor surface condition. A total of 127 existing defects were recorded and are provided in Appendix B. These findings showed that most individual defects related to signing alongside some consistent issues with stretches of poor road surface and worn markings.

For the whole route treatments, information provided about recent similar schemes carried out for the nearby A49 were investigated to identify potential treatments that could also be applied to the A41. Options and treatments that could be applied at a whole route level have been provided for a range of design factors. Recommendations include a tiering system for common hazard signing to provide consistency as well as bollards and edge lines for private accesses for retroreflective hazard marking.

Each of the cluster sites identified in the collision analysis technical note has been looked at in detail in terms of their current arrangement and condition. Recommendations found in Table 30 are then made regarding potential treatments to address collisions at those sites. During the site visit a handful of additional locations were also identified for which similar summaries and recommendations were provided in Section 8.

Finally, a Specifications Note has also been produced as a supporting document alongside the drawings and this study.

Contents

Tables and Figures

Tables

Figures

Purpose Of This Document

This document will be used as an advisory note by Shropshire and Telford & Wrekin Councils to inform future highways work, where appropriate, on the A41 within the extents covered by this report. Highway scheme design is carried by each Local Authority for works related to their respective networks. Specific schemes and associated funding will continue to be identified and prioritised in line with each Authorities existing approaches for highway intervention and funding available.

Abbreviations

To support the readability of this document a list of common abbreviations has been provided.

ABBREVIATION	DEFINITION
AADT	Annual Average Daily Traffic
ADS	Advance Directional Sign
DfT	Department for Transport
DMRB	Design Manual for Roads and Bridges
IL	Investigatory Level
LR	Low Risk
OS	Ordnance Survey
POPE	Post Opening Project Evaluation
PSV	Polished Stone Value
S2	Single carriageway, 1 lane in either direction
SCRIM	Sideway Force Coefficient Routine Investigation Machine
SLD	Single Lane Dualling
ST	Standard
SSD	Stopping Sight Distance
TSM	Traffic Signs Manual
TSRGD	Traffic Signs Regulations and General Directions
TWC	Telford & Wrekin Council
VAS	Vehicle Activated Sign
WMP	West Mercia Police
WS2+1	Wide Single 2+1 carriageway, 2 lanes in one direction and 1 lane opposing

Table 1 List of Abbreviations

1. Introduction and Background

1.1. Introduction

1.1.1 This report forms the second part of the A41 route study covering a 26.7-mile section of the A41 between the M54 in the south and Prees Heath roundabout in the north. It documents the full findings from a site visit undertaken in September 2023, reviews existing asset information and identifies options for treatments to address the collisions along the route. Accompanying sketches and drawings have also been provided in Appendix D showing standard arrangements for treatments which can be applied across the route as well as potential improvements that could be applied at relevant cluster sites. An additional drawing showing provision of treatments for the Newport Bypass services exit has also been provided upon agreement as it has multiple treatment options available.

1.1.2 Recommendations have been highlighted with a grey border throughout the report.

1.1.3 This options report follows on from the technical note completed in November 2023 containing the collation and analysis of traffic collision data from two highway authorities, Telford and Wrekin Council and Shropshire Council, responsible for this section of the A41. The Collision data covers the most recent five years 2018 to 2023 September. The note has since been updated with an addendum for additional data collected up to the end of November 2023 which was issued January 2024.

1.2. Background

1.2.1 Over the last 5 years this route has experienced a notable number of serious and fatal collisions and consequently this study has been commissioned by a partnership of both Local Authorities, West Mercia Police, Shropshire Fire & Rescue and the West Mercia Road Safety team in order to identify the causes of the collisions and potential solutions to address them. The main aim is to provide a route wide scheme to improve consistency of road condition everywhere and not just where schemes have had targeted treatments in the past, as well as identify any remaining locations where the recent collision history or road arrangement require more target intervention.

1.2.2 This route study shall review the length in question with the main aim to provide a route wide scheme to tackle the collision trend indicated by the data. A key desire of delivering this study over both local authority zones is that interventions are consistent over the route and variance across council lines is minimized. The study puts forward feasibility options that can be taken forward to detailed design and delivery from early in the financial year 23/24.

1.3. Geographical Context & Scope

1.3.1 The A41 is a strategic route connecting the West Midlands conurbation to Chester in Cheshire and continues onwards to Liverpool. It runs north-south through both Shropshire Council and Telford & Wrekin Council areas down to Wolverhampton and Dudley. The section of the route considered for this study is predominately a rural single lane A-road, although it does interface with small urban areas over its length and becomes a dual carriageway for a short distance as well as some short stretches in a 2+1 lane configuration. As a direct connection between west Birmingham and Liverpool it sees a higher-than-average volume of freight, mainly HGV’s using the route than most A-roads.

1.3.2 The part of the route under consideration covers a 26.7-mile stretch of the A41 from the M54 junction in the south to the Prees Heath roundabout in the north excluding those end junctions shown in Figure 1. There is also a single break, the A41/B5065 junction is a critical area being assessed with its own scheme which is also excluded. The route starts at Tong within Shropshire Council, passes through Telford and Wrekin’s locality, and then re-enters Shropshire at Buttermilk Hill.

Figure 1 A41 Route Being Assessed

1.3.3 There are a significant number of smaller industrial, commercial, and residential properties along the route which are all connected via direct accesses or priority junctions which are often closely packed together with each other and consistently on both sides. There is one moderately sized grocery shopping park at Newport and three petrol stations which are well-spaced, and the rest of the route is flanked by farmers' fields which have dozens of access gates and the occasional small grove.

1.3.4 This part of the route is largely straight with slight bends except for the dual carriageway section which turns east-west and a chicane at Sandford. There are three connections with other A roads, two roundabouts which interface with the segregated parts of the A518 and a third roundabout intersecting the A53. There are roughly seven streams that cross under the road through culverts throughout and small lakes or reservoirs are occasionally located nearby. The route has one crossing with the national cycle network located at Chetwynd.

1.3.5 This study is intended to remain as a high-level interpretation of existing data only, with no detailed design. A single day site visit has been carried out for basic fact finding and qualitative assessment involving a drive along of both sides of the route with recorded video taken throughout. The local authorities have stressed that valid solutions must aim to be effective, consistent options that aim to work in line with previous works and schemes across the entire route. Options have been selected on a whole of life low-cost approach to provide value for proposed works.

1.4. Methodology & Objectives

1.4.1 The route study consists of two parts of which this forms the second.

Part 1: Collision Analysis Technical Note

Part 2: Options Report with accompanying concept design drawings.

1.4.2 The technical note has been used to carry out an assessment of collision data provided by both local authorities. Some collision data was extrapolated where necessary. Clusters of collisions were then identified, and a basic analysis and overview of each site was carried out providing recommendations for future steps.

1.4.3 A site visit was also carried out involving a recorded drive along of both directions to provide video footage showing the current state of the road surface, street furniture etc as well as offer an understanding of how the route travels.

1.4.4 An options workshop with stakeholders was then held to discuss various route treatments and each of the cluster sites as well as a few additional locations which had been identified as requiring work. Existing site arrangements and methods were discussed as well as historical context for many of the cluster sites.

1.4.5 Finally, this options report and associated drawings are the conclusive works for the study. Design guidance for each aspect of the carriageway is presented with suitable whole route treatments. There is analysis of each cluster site and review of its existing state with provisional recommendations and improvements. A series of drawings have been created showing each cluster sites collisions and proposed recommendations as well as concept drawings for standard details of the carriageway and common junctions. Several additional locations have also been picked up as part of the review either by request or identified during the site visit and proposed treatments and recommendations have also been made for each.

2. Collision Analysis Summary

2.1. Overview

2.1.1 The first part of the route study is a separate collision analysis technical note. It is recommended that this is read alongside this Options report. The technical note has been written using collision data provided by both authorities from the last five years via the collection of STATS19 reports created by West Mercia Police. The report identifies collision trends, carrying out comparisons against national statistics and reaching conclusions based on the collision data provided. The analysis is split into whole route trends across the full dataset and collision cluster sites. The technical note concludes by making a series of recommendations including identifying measures to be investigated going forward for the cluster sites (see Table 2). A summary of the analysis and recommendations is now provided and informs the Options report.

2.2. Whole Route Conclusions

2.2.1 The A41 was found to have experienced a high rate of fatal incidents compared to the national average in recent years, and part of this was identified as collisions involving motorcycles and the elderly. Meanwhile, HGVs were thought to be present in notably fewer collisions than the national average. Flooding and wet conditions were found to be consistent with national averages and whilst darkness was found to significantly increase the likelihood of a collision occurring on the A41, no national equivalent could be found to give an effective comparison to draw a conclusion from.

2.2.2 The A41 was found to experience 11 fatal collisions per billion vehicle miles compared to the national average of 6.2 for other A roads and a similar ratio was calculated for casualties. Notably, the A41 carries a reduced number of serious and slight collisions and these help to pull down the overall KSI and total rates. The difference in KSI severity ratio between 31.8% for the A41 and 20.4% nationally showed that collisions on the A41 are significantly deadlier.

2.2.3 Most collisions on the A41 occur at junctions involving slowing traffic, turns or entering roundabouts and this is reflected in the high occurrence of factors involving driver behaviour, errors, or inexperience. It was also found that high speeds may be present around a few areas along the route.

2.3. Cluster Site Conclusions

2.3.1 The cluster site analysis conclusions from the technical note are summarised in Table 2 below showing which sites out of the original 15 were found to have a consistent trend and correlation in orange or were otherwise identified for possible treatments in yellow. Those not included had not identified any root causes and subsequently no potential treatments were provided.

CLUSTER	LOCATION	COLLISIONS	IDENTIFIED CAUSES OF COLLISIONS	POTENTIAL TREATMENTS FROM TECH. NOTE
2	A41/ Green Lane	2	No common root cause	Consider signing, speed control measures and options relating to multiple accesses.
4	Tern Hill Roundabout	9	Vision, focus, misjudgements	Pedestrian safety is of concern, review crossing options including signalised crossing. High visibility and low deflection give too much confidence to drivers and impacts speeds. Mitigating measures to be considered.
5	A41/Warrant Road	4	Junction layout	Consider signs and road marking improvements including central ghost island.
6	A41 by Newcott Fish & Chips	2	No cluster	Consider signing, speed and options relating to multiple accesses.
7	A41 by Blooming Barkers	2	Speed considerations, relevant signage, visibility	Improve signing, cut back vegetation to improve visibility.
8	A41/Hatton Road	3	Narrow field of view	Improve signing, cut back vegetation to improve visibility.
9	A41 600m North of Standford Service Station	1	No cluster	Consider removing inside bend vegetation, review extents of double white lines and consider extending them.
10	Forton (A41/A519/B5062) Roundabout	1	No cluster	Consider options relating to driver confidence, update markings and studs.
12	A41/B4379	7	Poor drainage and surface	Fix SB signs, add equivalent NB signs. Add further drainage capacity. Investigate debris and muck on road to identify appropriate mitigation and enforcement.
13	A41/King Street	3	Rear shunts at junction	Consider road surface, reinstall markings and studs. Install SB signs, Move NB signs, replace kerbing. Cut back vegetation.

Table 2 Cluster Analysis Results

2.3.2 These identified root causes and the potential treatments that would influence their removal shown above were used as a basis from which this options reports' further analysis and final recommendations were made, summarised in Table 30.

3. Asset Information & Programme of Works

3.1. Asset Information Provided

3.1.1 Data to support this study has been provided by both local authorities and stakeholders. Table 3 summarises the list of data and information that has been provided for context.

DATA	SOURCE	DESCRIPTION
Collision Data	Shropshire	Excel extract of tabulated STATS19 output for collisions from September 2018 to September 2023 with briefing note about collision clusters.
	Telford & Wrekin	Excel and pdf variant of STATS19 reports covering March 2018 to March 2023.
	West Mercia Polica	Update of collision reports covering March 2023 to November 2023 provided preliminary data about new collisions for whole route.
Traffic Data	Shropshire	Vehicle flow and class counts over several years back to 2015 within Shropshire.
	Department for Transport	DfT provides consistent geographical data points which receive a manual vehicle counter twice per decade and are extrapolated annually.
Speed Data	Shropshire	Speed data recorded alongside the vehicle flow counts was available for Shropshire data points.
	West Mercia Police	Summary of speed counts carried out earlier in 2023 across the full route.
SCRIM data	Shropshire	Plot of SCRIM data with output results provided for full route.
Asset data	Shropshire	Plots of barriers and lighting asset locations were provided as part of the SCRIM data output including spreadsheets with detailed asset info.
OS Data	Shropshire	Relevant OS tiles for the full route were provided.
Scheme, Development and Policy Information	Shropshire	Relevant programme of works for the A41 showed recent schemes completed over last few years and future schemes currently started in some form.
	Telford & Wrekin	Overview of carriageway and ground works completed for the A41 in 2023.
Safety Camera Partnership	West Mercia Police	List of locations that safety camera visits are carried out, the number of visits and offences throughout 2023 to November.
Flooding and Drainage	Shropshire	Example report of recent problems and actions taken involving gulley dig outs, grips and culvert bridge inspection.
	Telford & Wrekin	Overview of drainage works completed for the A41 in 2023.

Table 3 Client and Stakeholder Data Provided

3.2. Completed Programme of Works

3.2.1 Shropshire Council were able to provide a relevant list of integrated transport schemes which involved the A41. Table 4 summarises the recent schemes completed for the A41.

SCHEME	LOCATION	TYPE	STATUS	DETAIL
Sandford Speed Reduction	Sandford Chicane	Collision Cluster/Road Safety	Complete	Introduction of a new 40mph speed limit, new vehicle activated signs for the double bend, improved warning/directional signage, and carriageway resurfacing with new lining.
Stanton Road	Stanton Road Junction	Collision Cluster/Road Safety	Complete	Carriageway realignment and dedicated right turn lane. Introduction of a new 50mph speed limit and provision of a dedicated right turn lane at the Stanton Road junction with improved warning/directional signage, street lighting and carriageway resurfacing with new lining.
Sweet Apple Tree Crossroads	Sweet Apple Tree Crossroads	Collision Cluster/Road Safety	Complete	Upgrade of the A41 road markings and signing approach and within the junction area including the two side roads. Also, provision of double white lines to prohibit overtaking through the right turn lane.
Sandford Pool	Sandford Chicane	Signal Enhancement	Complete	VAS upgrade.

Table 4 Completed Shropshire Council Schemes

3.2.2 The scheme implemented at the Stanton Road junction has addressed a historic cluster site. The scheme has resulted in no collisions occurring at the junction following the scheme opening. The scheme at Sandford Chicane has also resulted in a reduction of collisions. The barrier to rolling this out route wide is that such a treatment requires the site not to be constrained for widening and involves some significant works. Justification for a similar treatment to be applied to other junctions would require a history of collisions as well as sufficient traffic volume before the cost can be justified. This is relevant as one of the few recent examples identified from the last five years of collisions where a treatment or solution was completed and then provided conclusive results. The Sandford speed reduction also appears to have yielded results, but this section is out of scope.

3.2.3 Completed TWC schemes involving the A41 for the 2022/2023 period were available on TWC's website. Most schemes have a location as 'ward wide' and so cannot be picked out but those specifically listed for the A41 are listed below in Table 5 which has been expanded upon from additional detail provided.

TYPE OF WORKS	LOCATION	DESCRIPTION
Carriageway	A41 – Standford Bridge – Traffic	-Multiple resurfacing of carriageway including high friction replacement -Ironworks resetting and replacements -Tree maintenance
Carriageway	A41 Chetwynd Junction – Traffic	-Various patching and joint sealing for carriageway -Ironworks resetting and replacements -Lining and signing replace/refresh -Grass cutting and hedge trimming -Tree maintenance
Drainage	A41 Rural Drainage Improvement	-CCTV surveys -Repair and upgrades including new carrier drain, catchpits, gullies.

Table 5 Completed TWC Schemes

3.3. Forward Programme of Works

3.3.1 Along with the completed schemes, Table 6 summarises the schemes due for construction or completion for the A41.

SCHEME	LOCATION	TYPE	STATUS	DETAIL
Tern Hill Collision Cluster	Tern Hill Roundabout	Collision Cluster/Road Safety	Construction 2023/2024	-Combined maintenance/safety scheme which included reducing the approach width to single lane and provision of new directional/warning signage at/on the approaches to roundabout. -Remedial work following scheme to address collisions associated with queuing traffic. Will include the installation of 'Queuing Traffic Ahead' warning signage on the A41 southbound approach to the roundabout.
Sandford Cattle Crossing	Sandford Chicane	Signal Enhancement	Construction 2023/2024	-Upgrade to existing cattle crossing warning lights.
Warrant Road/Tern Hill Airfield	Warrant Road Junction	Collision Cluster/Road Safety	Construction 2023/2024	-Is new collision cluster site identified as part of the collision cluster site analysis carried out in 2021. -Funding to progress scheme has been included in the Integrated Transport programme. -Is likely to include improvements to the existing warning/directional signage for the crossroads.
Woodcote Collision Cluster	Shifnal Road Junction	Collision Cluster/S106	Construction 2023/2024	-This scheme is currently undergoing detailed design and will include improvements to the existing warning and directional signage for the junction, the introduction of double white lines, and the implementation of a 50mph speed limit which will also extend into Telford & Wrekin Council's area.

Table 6 Shropshire Council Schemes Due for Completion

3.3.2 Both the Tern Hill and Warrant Road schemes overlap with cluster sites identified in the technical note. As the detail provided above does not imply any of the treatments recommended are to be undertaken already, both cluster sites have been considered ‘as is’ when proposing solutions. Consequently, recommendations for these sites can be taken forward as appropriate.

3.3.3 TWC’s website confirms that a second phase of the schemes shown in Table 5 will be carried out in Summer 2024 and further works to be considered from the end of recent resurfacing at Standford Bridge down to Forton Roundabout with a look to either surface dress or resurface that stretch within the next three to five years.

4. Site Visit

4.1. Methodology & Observations

4.1.1 A site visit was undertaken in September 2023. During which a drive through video of the route in both directions was undertaken. A camera was used to record video of the entire trip allowing for individual issues with road condition or street furniture to be picked out. Observations about the state and nature of the road and its assets were made and a review of the video footage is now summarised in Appendix B. Two additional sites have been identified as having a safety risk associated with them. These are detailed further in section 8.3 and 8.4.

4.1.2 The drive through video has been used to undertake a high-level desk review of the route to identify defects and issues with street furniture, surfacing, signing and road markings. Moving south to north, the route was split into eight sections and the results are categorised in Appendix B for each section.

4.2. Conclusions

4.2.1 Although not exhaustive, the site visit was able to provide an expansive list of current defects for the route. A total of 127 have been listed in Appendix B. Of these, a significant number involve signing. Consistent issues identified involve signs with damage often having a poor offset from the carriageway leaving them open to being hit, normally by HGV's resulting in broken or missing panels or leaning posts.

4.2.2 There also many signs which have a greater offset which leaves them open to being overgrown and obscured by the hedge line. There are only a few cases of equivalent signs missing for the other direction of travel and overall compliance to design standards is high, the only consistent issue of compliant design involves chevrons but is minor.

4.2.3 The remaining issues involving road markings, surfacing, and street furniture were as expected as a route of this length will have sections of all ages and stages of surfacing. Design wise only old laybys arranged for a trunk road presented any recurring substandard arrangement, with missing marker posts or insufficient layout to current standards. Additionally, no issues were found relating to any form of VRS, bends, carriageway travel or significant junction design.

4.2.4 Many of the defects can be resolved directly through existing maintenance regimes in combination with the adoption of the recommended whole route treatments. Where relevant defects have been identified at a cluster site and require action outside of usual maintenance these have also been included within the drawings. It is recommended that a sign cleaning and clearing programme be implemented along the route which would resolve almost half of the issues listed in Appendix B. Additionally, a sign and post repair and replace effort would also significantly reduce the number of listed defects.

5. Lessons from Comparative Routes

5.1. A49 Overview

5.1.1 Consideration of other recent schemes common treatments and solutions were sought after for supporting evidence. This was also suggested by the local authorities in meetings and the likely best example to pull from is the relatively recent spate of upgrades and schemes carried out for the A49 which saw a range of whole route treatments.

5.1.2 The A49 itself is close by, tying directly into the A41 at Prees Heath roundabout and experiencing similar geography and weather. It shares other characteristics with the A41 including being a rural single carriageway road passing through towns and villages as well as acting as a local distributor with numerous junctions and accesses throughout.

5.1.3 A high-level list of improvements the A49 has undergone is presented below in Table 7. These measures were introduced to bring route consistency and reduce collisions at bends, junctions and lay-bys. Similar treatments could be applied to the A41 in the same way. It should however, be noted that the A49 is a National Highways road and therefore has greater funding available for it and that as the improvement program has never undergone a Post Opening Project Evaluation (POPE) scheme the impacts of the applied treatments have not been measured.

SITE	IMPROVEMENT
A49 Bayston Hill	- Provision of a signalised Pedestrian crossing, resurfacing, road marking renewal and upgrade of street lighting to LED.
A49 Ashford Bowdler	- Provision of a Right Turn Lane (Ghost Island). Associated carriageway widening, footway realignment, Pedestrian refuge, lay-by adjustments (traffic flow restrictions), associated signing & lining.
A49 Lay-by Improvements	- Lay-bys identified for review due to collisions resulting from vehicles entering/emerging. Improvements included changes to advanced signing, improvements to footways, installation of Emergency Roadside Telephone ERT's, carriageway re-lining and modifications to traffic flows to restrict vehicle movements.
A49 Shropshire Safety Improvements	- This scheme incorporated two safety improvements schemes listed below (Bends & Junctions)
A49 Shropshire Bends	- Scheme aim is to reduce collisions and increase EuroRAP rating from 2* to 3*, Proposals based on category of bend to create a consistent approach along the route. - To achieve this improved rating a signing and lining treatment adopted from Scottish Executive and procedure Guide E115 will be used which prescribes different treatments for different bends based on their radii. (91 in total). Category A: 100mm wide edge and centre line (S2) Category B: Cat A + Hazard marker posts at 9m centres Category C: Cat A, B + Bend warning sign at a distance based on 85%ile approach speed. Category D: Cat A, B, C + Chevron warning sign(s) & 'SLOW' road marking adjacent to warning sign. Category E: Cat A, B, C, D + 'SLOW' road marking at an intermediary position before the bend.
A49 Shropshire Junctions	- Scheme aim is to reduce collisions, Proposals based on type of junction and visibility requirements to junction, all formal junctions along the route have proposals - 53 In total - Works included: Double white lines at all ghost islands and red HFS infill of hatching. Red HFS under centrelines on approach to all junctions, Glasdon Admiral bollards installed at all junctions, junction warning signs depending on visibility & refresh of other road markings.

Table 7 A49 Improvements 2014-2022

5.1.4 The Bayston Hill pedestrian crossing has been discounted as the A41 experiences very little pedestrian traffic as well as the red infills used on the Shropshire junctions, which have been ruled out as unsuitable due to the additional maintenance burden and consequent costs associated with maintaining them. Others include much the same of what has already been done such as the provision of right turn lanes, ghost islands and signing upgrades which supports the continued implementation of similar treatments and the similar focus on junctions should be noted. The lay-by and bend improvements are both relevant for consideration of possible A41 treatments. A key factor in the work carried out on the A49 was also the focus on consistency which match the brief for this report.

5.1.5 A desktop study using online mapping was undertaken to ascertain if, when and where changes in the general carriageway design occurred on the A49. Some noted treatments different to the A41 in its current condition are:

- Short stretches of widened centrelines with red infill around areas with multiple private accesses or junctions.
- Marker posts for an uncontrolled pedestrian crossing that likely sees more pedestrian traffic than normal.
- Multiple vehicle activated speedometer signs (VAS) in villages.
- Multiple red infills on approach to speed reductions with speed limit road markings.

5.1.6 Although the red infill can be discounted, the A41 does have numerous sections with multiple accesses and junctions closely spaced which would benefit from the type of treatments used on the A49, but currently only the section at cluster site 6 – Newcott Fish & Chips - uses a centre hatch . A new location that would benefit from centre hatching is Wistanswick crossroads pictured below in Figure 2.

Figure 2 Wistanswick Crossroads (Source: Google Maps)

5.1.7 This crossroads at Wistanswick has 5 private accesses on either side of it, one of which is a commercial car business. A centre hatch is recommended here which would Highlight accesses in advance via gaps in hatching and pushing vehicles to the outside of the carriageway providing drivers more time to react and create more clear space in the middle for manoeuvring, reducing the chance of an incident related to vehicles entering or exiting the main road. This should reduce the likelihood of common junction collisions categorised as rear shunts and bad turns.

5.1.8 Marker posts are highly inconsistent along the A41 and appear to only have been installed privately. These can be relatively low-cost solutions to aid in the demarcation of accesses and hazards that are unlikely to require consistent replacement. Good examples of where they could be applied on the A41 in a similar manner are the pedestrian and cycle crossings at Chetwynd in Figure 3 pictured below as well as the similar crossing on the northern exit to the A518 roundabout.

Figure 3 Chetwynd Pedestrian and Cycle Crossing (Source: Google Maps)

5.1.9 Both crossings form part of National Cycle Routes and thus are likely to experience a greater degree of use than most others. Marker posts at either site would aid in drawing drivers' attention to the side of the road for waiting cycle traffic where along most of the route they typically aren't expecting such crossings to occur. This advance highlighting should help drivers identify whether they need to slow down and be aware of the hazard further in advance.

5.1.10 The locations the A49 has had VAS installed are in villages, whilst the A41 travels along several bypasses. Woodcote village currently has VAS installed on the A41 and this appears to be a similar successful implementation without need for change. VAS suitability is covered within hazard signage in 6.7.

6. Whole Route Options

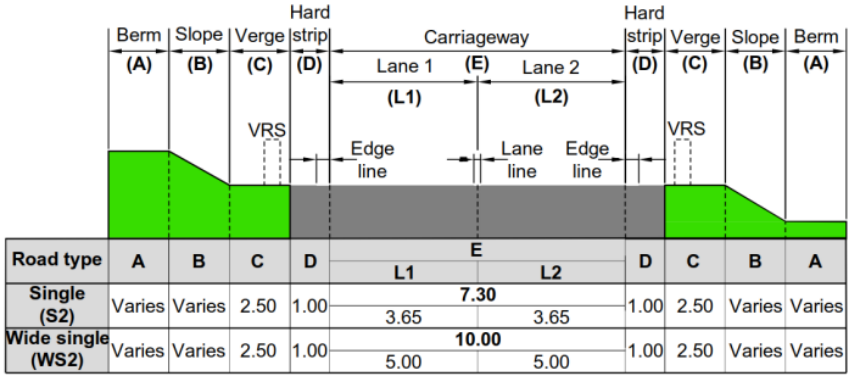
6.1. Overview

6.1.1 As part of this report a series of low-cost and regular treatments to be applied across the entire route in question have been provided with the aim of increasing route consistency (identified as poor in S3.1 of the collision technical note) of arrangement, signing, and marking. The sections below detail each area of highways design that was considered and cover relevant aspects for proposals going forward. These are also captured in drawings numbered COMHA1T&W038-AMY-GEN-A41-DR-CH-0001-5 and COMHA1T&W038-AMY-GEN-A41-DR-CH-0007 & 8 found in Appendix D.

6.2. Carriageway Cross Section

6.2.1 The A41 is a predominantly single carriageway road, with short sections of dual carriageway as well as overtaking sections in a WS2+1 configuration. Several junctions have ghost islands for right turn movements, but most do not, and there is also one section with a widened, hatched centre line. Carriageway width also varies at points between 6m and 10m without clear reason. Treating these inconsistencies is expected to raise route consistency. Typical details for standard cross sections to be applied along the route including road marking layouts are shown in COMHA1T&W038-AMY-GEN-A41-DR-CH-0001 in Appendix D.

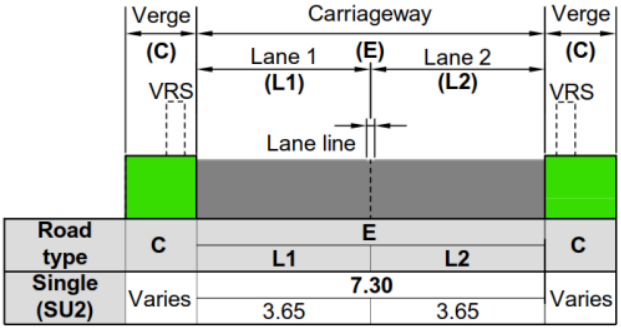
6.2.2 DMRB CD127 provides a default cross section of highway for a rural mainline single carriageway road, shown in Figure 4. Both 1m hard strip and edge lines are provided with two 3.65m lanes. As the A41 is a high-volume strategic route, this would be the ideal cross-section across its full length.



Road type	A	B	C	D	E		D	C	B	A
					L1	L2				
Single (S2)	Varies	Varies	2.50	1.00	7.30		1.00	2.50	Varies	Varies
					3.65	3.65				
Wide single (WS2)	Varies	Varies	2.50	1.00	10.00		1.00	2.50	Varies	Varies
					5.00	5.00				

Figure 4 Mainline Single Carriageway Cross-Section (DMRB CD127, 2.1.1N1e)

6.2.3 Due to boundary constraints, much of the route still exists as a single carriageway road without hard strip or edge lines, which is in line with the urban mainline single carriageway road such as the cross section shown in Figure 5:



Road type	C	E		C
		L1	L2	
Single (SU2)	Varies	7.30		Varies
		3.65	3.65	

Figure 5 All-Purpose Single Carriageway Cross-Section (DMRB CD127, 2.1.1N1g)

6.2.4 As a full upgrade for its entire length is neither cost effective nor practicable. A focus should be on which aspects of the mainline cross section are feasible for upgrades and which can be maintained along much of the length of the route. Edge lines are one of the best consistent additions available to make, both in terms of cost and added benefit when used correctly. Ensuring these are consistently applied where necessary along

the route will aid in alerting drivers to upcoming accesses which are extremely common, as well as aiding in lane compliance whilst driving in darkness for which most of the route is unlit.

6.2.5 Kerbing alone is a suitable low-maintenance alternative that requires less upkeep, but it offers no retro-reflectivity in darkness, during which 19% of recent collisions have occurred with no lighting. Consequently, it is suggested that where the existing layout is maintained where there is street lighting, or straight sections with few or no accesses. Whilst edge lines would be beneficial around areas with a significant number of accesses (ignoring field accesses) or harsh bends requiring chevrons. Guidance states that:

'*Where there are no adjacent footways, kerbs should not be provided except where they are necessary for drainage purposes or to act as a minor restraint, e.g. at traffic islands and in structures or tunnels.*' (DMRB CD127, 2.27.4)

6.2.6 Therefore, it is important that where kerbing is used, the justification includes requiring drainage or restraint for a specific hazard. The types of kerbs in current use are also to standard.

6.2.7 Guidance covers the following about hard strips:

'A hard strip provides a surfaced strip that abuts the carriageway. The key reasons for the provision of

hard strips include:

1) pavement integrity/stability.

2) partial provision for stopped vehicles.

3) snow and water collection.

4) overrun facility for driver error or evasive action.

5) improved level of service and driver comfort.

6) supports edge lines.

7) reduces the risk of vegetation encroachment over edge lines.

8) allows for the placement of road studs outside vehicle wheel paths, where appropriate.' (DMRB CD127, 2.6N2)

6.2.8 Although the addition of a hard strip would be a beneficial addition to the standard cross-section of the road and is present in some parts. The A41 simply has too many constraints along its length to reliably implement a hard strip without causing inconsistency and consequently, this has not been pursued as part of the default design. Where there is already a hard strip in place or existing section of wide carriageway this should continue to be maintained as is, with either the 1m or 0.5m width arrangement where possible but down to 0.3m is also acceptable as a relaxation (DMRB CD127, E/3.3).

6.2.9 As the A41 carries very little pedestrian/equestrian footfall or cycle traffic and is often enclosed by hedgerows demarking farmers' fields or private property, providing a consistent and proper verge or footway is difficult and introducing these were not considered further against the roads existing constraints, but recommendations are that where possible the verge should be 2.5m in width to allow for vehicle overrun and signage. A consistent theme identified in the site visit observations is that as the verge is often not 2.5m then traffic signs are being obscured or overgrown as a result. This can be addressed by routine maintenance.

6.2.10 Due to the length and variation of the route. It is proposed that any works requiring changes to the carriageway cross section are integrated alongside resurfacing work within the existing maintenance schedule. An example of a location which could be improved with continuation of edge lines and hard strips is shown below in Figure 6.

Figure 6: A41 Newport Road Cross-section (Source: Google Maps)

6.2.11 There is a short dual carriageway section shown in Figure 7 along the route for 3km north of Bletchley. This has a 0.5m hard strip, edge lines, a 5m central verge with VRS only present at the bends and has an unrestricted speed limit. One slight and one serious collision have been present here but both are unrelated to each other and the section itself.

Figure 7 Dual Carriageway Section (Source: Google Maps)

6.2.12 Some signs along this section were identified as not being passively safe and the road markings can be quite worn. Although VRS was not identified as an issue in the collision analysis, the current arrangements have been observed to be inconsistent and could benefit from being reviewed[1].

[1] Any review undertaken should be made against the requirements of DMRB CD377 *Requirements for Road Restraint Systems*

Edge lines

6.2.13 Edge lines are recommended by guidance ‘to delineate the edge of carriageway, particularly on unlit classified roads and those not having clearly defined raised kerbs’ (TSM Ch.5, 2.5.6). Both traits are pertinent to the A41. From Figure 8 below, the dashed line on the left should be used across direct accesses and laybys. The figure on the right should be used as the carriageway standard to aid in delineating the edge of carriageway otherwise:

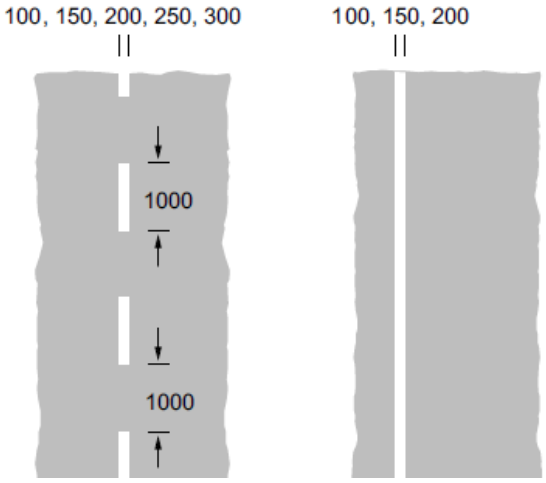


Figure 8 Edge Line Arrangement (TSM Ch.5, 2-6)

6.2.14 As the A41 does not maintain a consistent hard strip it is better to apply the guidance assuming there is none with a 225mm offset, in which case the default width for the solid line should always be 100mm matching the centreline. For the dashed line, the width should be 100mm at sections where the speed limit is 40mph or less and 150mm otherwise. With consideration to guidance, (TSM Ch.5, 2.5.10) Table 8 provides a list of locations where edge lines could be provided, if the carriageway width provides then a hard strip may also be possible.

LOCATION	PROVISION
Tong Interchange – Pickmere Roundabout	Edge lines + hard strip
Chatwell Lane - Lynn turnoff	Edge lines
Standford Bridge - Shakeford	Edge lines
Crickmerry Bank – Sutton Heath Farm	Edge lines
Ternhill Roundabout – Chapel Lane	Edge lines
Green Lane – Mill Lane	Edge lines

Table 8 Recommended Locations for Edge Lines

6.2.15 An additional treatment at extra cost would be the use of green studs along entrances to direct accesses, laybys and diverges. If green studs are to be used, then a spacing of 8m is suggested as per guidance (TSM Ch.5, 2-5). This treatment has seen some use elsewhere and has a more beneficial effect on vehicles with weaker headlights such as motorcycles and may explain why it has been used on the A9 in Scotland which connects popular leisure routes as these tend to carry more motorcycle traffic. As covered in the technical note, the A41 also carries a higher volume of motorcycle traffic than normal, and they are overrepresented in the fatalities it has recently experienced. However, it is unproven such a treatment would have influenced any of the recent fatalities involving any vehicles.

6.2.16 Edge lines and hard strips should always continue until the carriageway narrows rather than ending abruptly. Edge lines will better delineate accesses and provide a visible edge of carriageway in dark conditions to aid in lane adherence and help prevent errant behaviour. Hard strips provide additional carriageway width for errant vehicles to course correct before contacting the verge. These treatments will reduce collisions relating to loss of control and poor lane adherence.

Bends

6.2.17 Drawing COMHA1T&W038-AMY-GEN-A41-DR-CH-0004 in appendix D provides details of typical details of the treatment that should be applied to bends including road markings and signs.

6.2.18 Carriageway design along bends has been considered, guidance recommends if the radius of a bend is between 90 and 150m then widening along the curve should be applied by 0.3m per lane (DMRB CD109, 4.10). A cursory check of the route found only a few bends would likely be close to this criterion but was found unlikely to be necessary. Even for cluster site 7 which is the only fatal collision recorded for a bend due to taking the corner at speed, an additional 0.3m lane width would not have provided any benefit in that instance. It is possible that a stronger warning system highlighting the bend in advance instead, may have helped which is expanded upon in 6.7.

6.2.19 If a cluster site at a bend was found to have a more severe history of collisions, then a stronger case could be made for a higher-level treatment, but this is not currently found to be the case except for the Sandford chicane which is out of scope and undergoing its own treatment from another scheme.

6.2.20 Consequently, a tiering system used along the A49 and for hazard signing would be beneficial such as in Table 7, however as the few relevant bends for the A41 are similar and already have some of the higher category treatments, a single recommendation has been made equal to category D. Markings should include a centre line, edge lines and advance signing using a bend hazard sign with yellow plate if necessary, as per Table 12 in Section 6.7. This treatment satisfies the expectation laid out previously (6.2.18) by strongly warning drivers of approaching hazards, encouraging lower speeds.

6.2.21 Additional signing at the bend itself should include appropriate chevron signs correctly arranged, and this recommendation is included for both bend drawings as one has them arranged incorrectly and another has too few signs. It is accepted that due to recent maintenance work involving a dig out of the kerb, edge lines have been removed from the bend at cluster site 9 and have not directly been asked to be replaced. These changes are in line with the intended goal of signposting the bend to drivers.

6.2.22 Finally, with a focus on whole route treatments, horizontal alignment design elements involving road camber and super elevation have not been considered. Detailed topographical information to identify locations where gradients are above 6% has not been available for this report. The expectation is that this is already in a suitable arrangement.

6.3. Centre lines

6.3.1 The existing state of centre line markings for the A41 is broadly to standard and so the following covers much of what is already present along the route and should be continued. Centre line markings can be defined by Figure 9:

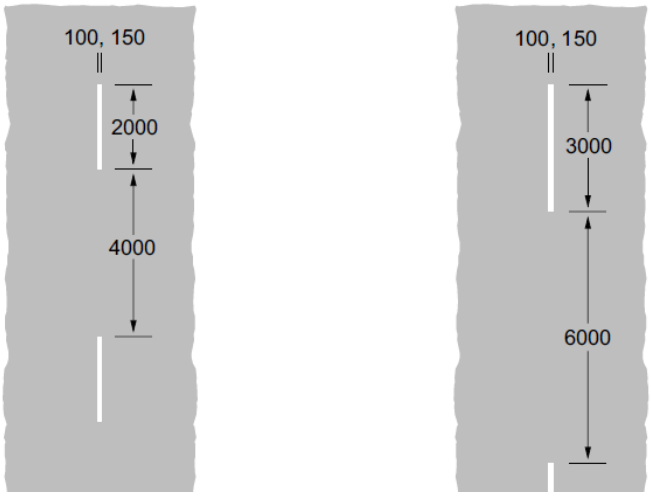


Figure 9 Centre Line Default Arrangement (TSM Ch.5, 2-1)

6.3.2 Normally the 100mm width marking will be suitable in all cases. Where the speed limit is permanently 40mph or less then the arrangement on the left should be used with a stud spacing of 12m, whilst the arrangement on the right is suitable for sections permanently over 40mph with a stud spacing of 18m.

6.3.3 Centrelines should also forecast the approach of hazards such as an approaching roundabout, junction or bend, in which case a warning line (which is the inverse of the default centreline) should be used as in Figure 10 below for the same speed requirements:

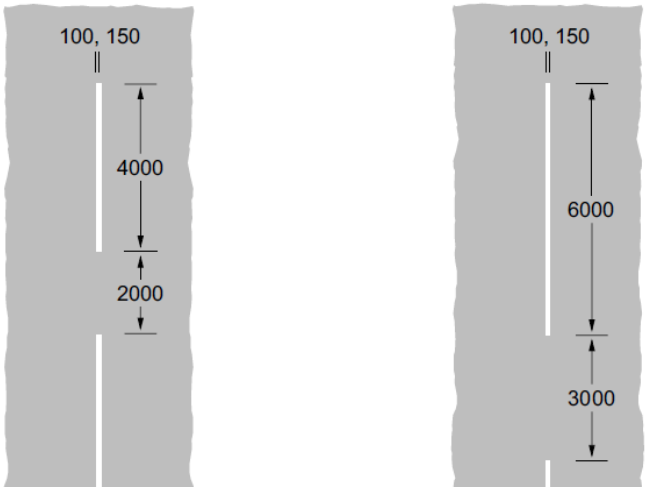


Figure 10 Centre Line Warning Arrangement (TSM Ch.5, 2-4)

6.3.4 The minimum number of warning lines on approach to a hazard is 7 for most hazards on the A41 and stud spacing should be reduced to 6m or 9m for the respective speed limits. Although standards also suggest warning lines should be used when the visible overtaking distance is not available. This would likely cause an overuse of them along a road such as the A41 and as collisions occur overwhelmingly at junctions rather than bends, junctions are specifically where they should be used for the greatest effect.

6.3.5 Although a case could be made for widened centre lines with hatching to aid in reducing the chances of lane divergence. There was only one location found with an arrangement that may benefit from these shown in Figure 2 that is also not constrained. However, this location has also not experienced enough collisions to justify the cost and so no recommendations have been made for these.

6.3.6 In conclusion, the only recommendation for centre lines is to maintain the use of warning centre lines for junctions, which experience most collisions in line with the Warning Line Visibility Distance provided in Table 9. This provides drivers with a consistent timing of advance hazards to help them manage reductions in speed consistently. This is expected to reduce the collisions occurring at junctions.

6.4. Double White Lines

6.4.1 The A41 has a high number of collisions occurring because of poor judgement or aggressive driving involved in overtaking. For relevant road markings prohibiting overtaking, there are two major situations to consider. Firstly, where the A41 needs more double white lines at locations which would benefit from reducing dangerous overtaking occurring from misjudgements and secondly, ensuring that the route as a whole still maintains enough overtaking areas across a sufficient length to reduce driver frustration and assuage aggressive attempts.

6.4.2 Drawing COMHA1T&W038-AMY-GEN-A41-DR-CH-0005 has been provided showing a few sketches for double white line arrangements under Appendix D and this arrangement has then been used in recommendations for cluster sites two, seven, nine. The reasoning for these cluster sites is summarised in Table 2 and detailed in the Collision Analysis Technical note. Potential locations related to visibility are provided in 6.4.7.

6.4.3 Guidance states that '*the overtaking value for a rural S2 road shall be 30%.*' (DMRB CD109, 9.2). A quick analysis of the route showed that this requirement is currently met and even with additional overtaking prohibition applied, is not at risk of being breached.

6.4.4 The visibility distance plays a large part in ruling where overtaking should be prohibited and is based on the 85th percentile speed of private cars on the road. It is split into the minimum distance (V) and warning line distance (W). The most relevant distances for the A41 are shown in bold in Table 9 below.

85TH PERCENTILE SPEED OF PRIVATE CARS (MPH)	DESIRABLE MINIMUM VISIBILITY DISTANCE V (M)	WARNING LINE VISIBILITY DISTANCE W (M)
Up to 30	75	115
31 to 40	**95**	**160**
41 to 50	**120**	**195**
51 to 60	**150**	**240**
Over 60	175	275

Table 9 Visibility Distance (TSM Ch.5, 2-4)

6.4.5 It is recommended that W can be used as a design metric for centre warning lines approaching junctions whilst V can be used as a hard limit where overtakes below this distance must be prohibited at locations where double white lines are deemed necessary by other factors. Proposals are shown in multiple drawings listed in Appendix D and suggestions relating to visibility only are provided below in 6.4.7. These changes will help enforce lane adherence in sections of road with insufficient visibility and is expected to reduce head-on type collisions.

6.4.6 Guidance supports using visibility distance that should be supported by collision data and visual inspections as factors within a larger scale plan (TSM Ch.5, 3.9.1). Consequently, these distances can be used to inform the design and layout of double white lines where relevant but not as justification for implementing them in the first place. As the collision analysis did not conclude that any cluster sites were identified with overtaking being an issue, locations where possible treatments could be applied have been identified by visual inspection of the route only.

6.4.7 Google maps was used to carry out a preliminary view of each bend to identify where there was a breach of V via the measurement tool. Working south to north the following locations were identified:

- The chicane at Hand lane - The speed limit is unrestricted, and from both directions overtaking prohibition is sited approximately 135m northbound and 125m southbound. It is suggested to bring the solid white lines on both sides out to a minimum visibility distance of 150m.
- The bend north of B4379 – The speed limit is unrestricted, and the southbound direction is correctly sited at 150m however northbound is only 135m and should be extended.
- Cluster site 9 600m north of Standford Service Station – The speed limit is unrestricted, and the southbound direction is only sited with visibility of around 105m remaining which should be extended to 150m. The northbound direction is correct.
- Cluster site 7 Blooming Barkers – An unrestricted speed limit here requires a siting of 150m which the northbound direction meets. However, southbound only starts 135m and should be extended.
- Rosehill Bridge – This is the only location where the vertical alignment of the road comes into play. Directly north of the bridge the road dips rather suddenly and this reduces the visibility to an unknown degree which cannot be measured. It is suggested that a proper measurement of the superelevation be carried out here to ascertain if visibility is suitable to have no overtaking prohibition here.
- Large bend located between Sandford and dual carriageway section – There is an unrestricted speed limit but NB has solid centre line starting only with 92m of visibility. Southbound direction is fine.
- The next slight bend just further north before Sandford farm - The Northbound direction again has the centre line starting at only 110m of visibility whilst Southbound is still fine.

6.5. Private Accesses

6.5.1 Although it is a high-volume strategic route, the A41 has a high number of private accesses along the stretch in question. This will be partially down to its age and in locations where it was given a more recent upgrade then the rate of accesses decreases along those sections. Since the 1980's the road has been integrated into new routes featuring numerous bypasses around local population centres including Hinstock, Newport and Whitchurch which makes it an attractive trunk road picking up traffic between Birmingham and Liverpool and the more local towns.

6.5.2 Consequently, this high traffic volume greatly increases the chance of multiple vehicles interacting at turn offs which is shown in the collision data. Table 9 from the Tech Note summated the whole route contributory factor data, of which driver error or reaction had the highest count by far. Table 10 from the Tech Note categorised the collision types and showed that rear shunts and bad turns accounted for more than half of all collisions. It is within these categories that interactions and therefore collisions at private accesses occur (Although several collision descriptions differentiate between vehicles at junctions and accesses, many do not and so the ratio between the two is unknown).

6.5.3 Drawing COMHA1T&W038-AMY-GEN-A41-DR-CH-0002 in Appendix D provides typical details of access layouts. These should be applied consistently across the route and existing accesses should be upgraded accordingly as part of maintenance.

6.5.4 By providing accesses to a consistent standard set by DMRB there can be confidence that vehicle interactions are similar across the route. Accesses with differing widths or kerb radii would result in turning vehicles entering and leaving at different speeds whilst inconsistent visibility splays introduce variance on when vehicles entering the road believe it is safe to do so. Marker posts and edge lines are also proposed for clear identification. As many accesses already have one or both, leaving them as they stand is counter to the goal of raising route consistency and so the alternative would be to remove them. This option is considered a risk due to:

- No available data on how many collisions involve those unfamiliar with the road.
- The greater than usual number of motorcycle journeys present along the route.
- The higher rate of nighttime collisions. Removing assets used to highlight accesses in advance.

6.5.5 As a result, it was not taken forward as a lower maintenance alternative.

6.5.6 Guidance states that ‘A direct access should not be provided on trunk roads where it is feasible to provide an alternative access onto the local road network.’ (DMRB CD123, 4.1.1) and so tries to greatly restrict their use as much as possible on trunk roads, ideally using side roads as much as possible. It is recommended that for the future a doctrine of substituting existing private accesses onto the A41 for other nearby service roads be implemented where possible as well as no more be given permission to be built going forward.

6.5.7 Private accesses should all have unobstructed visibility within a visibility splay shown in Figure 11. Ideally, this (X) should be 4.5m back from the edge of the major road, but the relaxed minimum reduces to 2m:

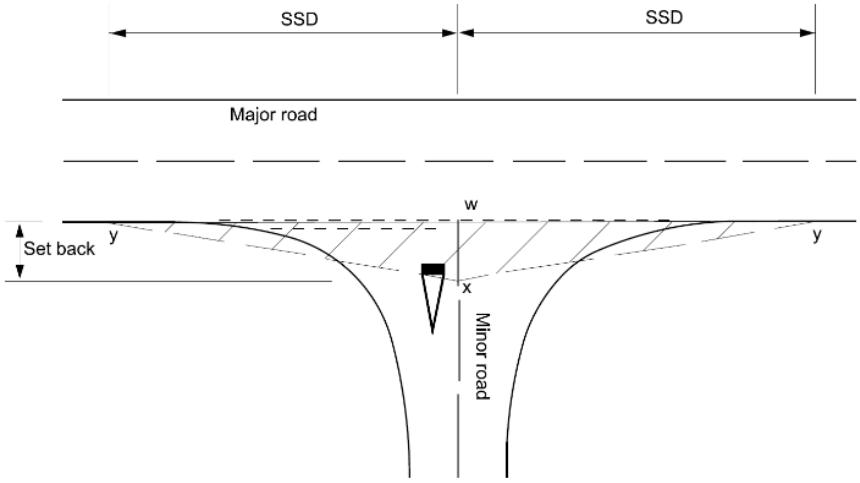


Figure 11 Minor Road Visibility Splay (DMRB CD123, 3.2a)

6.5.8 The Y value is set by the stopping sight distance (SSD) which is shown in Table 10 below.

SPEED (MPH)	SSD (M)
40	120
50	160
60	215

Table 10 SSD per Vehicle Speeds

6.5.9 This requirement is also set between a height of 1.05m and 2m. Most of the accesses along the A41 do not achieve the 4.5m splay and not all even achieve the minimum of a 2m setback. For those locations, this requires vehicles to enter the road blindly and hope to speed up in time to avoid a collision. The presence of slight bends at the higher speeds can also have a detrimental effect on how far down the road the driver can see regardless of there being a visible obstruction or not. All of this affects the ability for vehicles to pull out safely.

6.5.10 For vehicles trying to pull out or enter, the geometry of the access also has guidance which expects an entryway splay of 1m by 1m or 2m by 2m for fields which replaces the corner radii required for junctions shown in Figure 12:

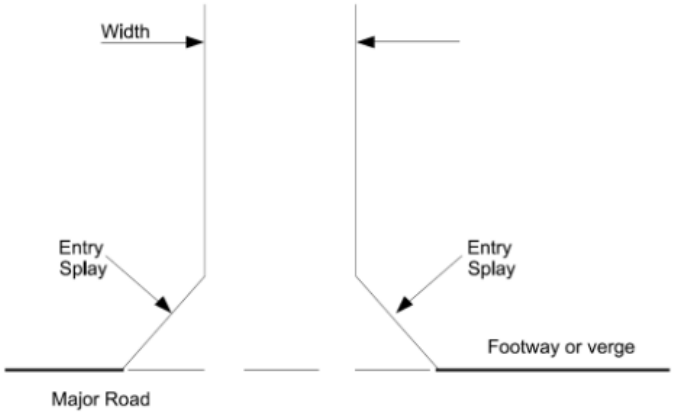


Figure 12 Entryway Splay (DMRB CD123, 4.2)

6.5.11 Numerous existing arrangements along the road do not have this and the consequence is that vehicles pulling in or out must reach a lower speed to make the turn. This then results in vehicles being closer to stationary on the road for longer, decelerating to a slower speed upon exiting and taking longer to speed up when joining, which increases the chances of an event involving other vehicles needing to take action which can lead to a collision.

6.5.12 Private accesses should be delineated by a dropped kerb and where there are edge lines, a single hatched line. They should also be supported by a single marker post on either side of the entrance which helps clarify the existence and extents of the access to approaching drivers. These should ideally be set at an offset of 1.2m from the carriageway and 1.2m from the access edge on either side and drawings COMHA1T&W038-AMY-GEN-A41-DR-CH-0007 and COMHA1T&W038-AMY-GEN-A41-DR-CH-0008 have been provided in Appendix D showing standard details for appropriate Glasdon products for example, although other equivalents are available.

6.5.13 It is recommended that the vegetation clearance is undertaken to maintain visibility splays of at least a 2m setback. This in some cases may need enforcement against adjoining landowners. If sufficient space is available, then entry splays should also be created.

6.5.14 An additional treatment option at a higher cost is the use of green studs along the edge line of a private access at a spacing of 8m shown in Figure 13. This is allowed under (TSM Ch.5, 2-5) and would mirror the existing arrangement required for laybys. Although the installation cost would be equivalent per metre of access, it should be expected that these will fare much better in terms maintenance requirements as they will experience much lighter and infrequent use than those used in laybys.

Figure 13 Edge of Carriageway Green Studs used on the A95 (Source: Google Maps)

6.6. Junctions

6.6.1 This section of the A41 also has several priority junctions which are used to connect small residential or commercial developments as well as a handful of side roads which generally provide an east-west connection. Drawing COMHA1T&W038-AMY-GEN-A41-DR-CH-0003 has been provided showing a few sketches for the proposed default side road arrangement under Appendix D.

6.6.2 They bring with them the same visibility requirements as private accesses with visibility required out to the splay along the road with a 2.4m setback which is even more important for them as they tend to carry much more traffic than private accesses and therefore the risk from not ensuring that exiting vehicles can see along the road is greater.

6.6.3 Unlike private accesses however, these junctions will require a kerb with a corner radius capable of supporting the entry and exit of traffic. For junctions which do not account for design vehicles this will be a simple corner kerb. Those junctions which account for the design vehicle are likely to be used by HGV's and would benefit from a taper to support their reduction of speed on approach. The A41 currently has a combination of junctions with both types of corners shown in Figure 14.

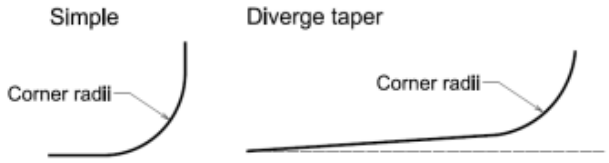


Figure 14 Junction Corner Arrangements (DMRB CD123, 5.6)

6.6.4 For simple junctions with no taper then a corner radius of 10m would be sufficient for all areas, although that can be reduced within more urban environments which have a lower speed limit to 6m. For those turn offs designed for HGVs especially with higher speeds, a corner radius of 15m with a corner taper of 1:10 over 25m is likely the best arrangement for those junctions. For the staggered junction, a longer taper of 1:8 over 32m is suggested.It is recommended that all junctions along the route be categorised with one of these arrangements and corrections applied where required with the recommendation in 6.6.6 kept in consideration.

6.6.5 Taper diverges are useful for aiding fast exiting traffic to slow correctly, however a taper still means that the vehicle decreases speed on the highway lane which can impede following vehicles and encourage inappropriate overtaking. DMRB CD123 does recommend that when the major road exceeds 7000 AADT, that auxiliary lanes in Figure 15 should be used over a taper diverge.

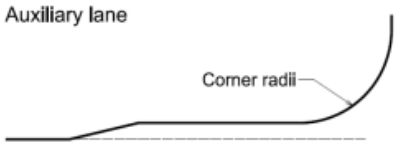


Figure 15 Junction Auxiliary Lane Arrangement (DMRB CD123, 5.6)

6.6.6 The A41 exceeds 7000 AADT for the mainline and has several tapered diverges which could be upgraded. However, as significant works would be required to upgrade the junctions, including in some places land acquisition, this level of intervention can only be justified as part of a junction improvement or safety scheme. It is therefore recommended that existing taper layouts are maintained.

6.6.7 The angle of approach for junctions is also stipulated to be at least 70 degrees as a minimum, however 90 is preferred and most junctions along the route achieve this which helps greatly with exiting driver vision. There are a few exceptions – Blooming Barkers (Figure 16), Plough Bank, Chatwell Lane, which would benefit from an effort to realign them in the future although it is accepted such treatments are expensive, disruptive, and again, have insufficient collision histories to justify such intervention.

Figure 16 Junction Beside Cluster Site 7 Blooming Barkers (Source: Google Maps)

6.6.8 These side roads which join at a sharp angle, also do not have the required increase in carriageway width which comes with such an angle. Guidance details that a junction at 90 degrees would have a width of 3.8m for each lane, totalling 7.6m (DMRB CD123, 5.10). However, for a junction at 50 degrees this width requirement would rise to 8.7m with a slightly wider inside lane to account for vehicles taking the turn. Consequently, this requirement should be noted for future works if they are carried out.

6.6.9 There are also a few side roads where the exit is too narrow or sharp, Aychley Farm has a simple junction shown in Figure 17.

Figure 17 Simple Junction Near Aychley Farm (Source: Google Maps)

6.6.10 This simple junction currently lacks the width and corner radius to support vehicles on approach turning at speed and should have a corner radius of at least 10m and width of 2.5m (but ideally 3.1m for service vehicle access DMRB CD123, 4.2.1N). Similar junctions which lack one or both factors from south to north include:

- Chatwell Lane and King Street
- Damson Lane and Hand Lane
- The B4379 and Standford service station exit.
- Mill Green and Rosehill Carp Fisheries exit.

6.6.11 The suggested long-term treatments for these locations are to widen the carriageway on approach to the junction and provide a sufficient kerb radius if and where constraints allow. As covered previously, (6.5.4) consistent arrangements create consistent vehicle interactions which users can account for.

6.6.12 As most junctions on the A41 are priority junctions, it is common for them to be delineated by a double hatched line denoting priority. However, unlike private accesses, junctions hatched lines should be in line with the edge of carriageway rather than the major carriageway edge line, this also changes the point from which the visibility splay is measured which means junctions require more visibility from a greater setback. A give way sign should accompany the road marking. No junctions were found needing changes to meet this arrangement.

6.6.13 The Warrant Road junctions are close enough that islands were put in to prevent diagonal crossings from the minor-minor road traffic. The design and use of these is within standards, however it would be beneficial to maintain the same offset distance from the main carriageway. Here in Figure 18, one island appears to have twice the offset distance of the other which also results in the bollards being inconsistently placed.

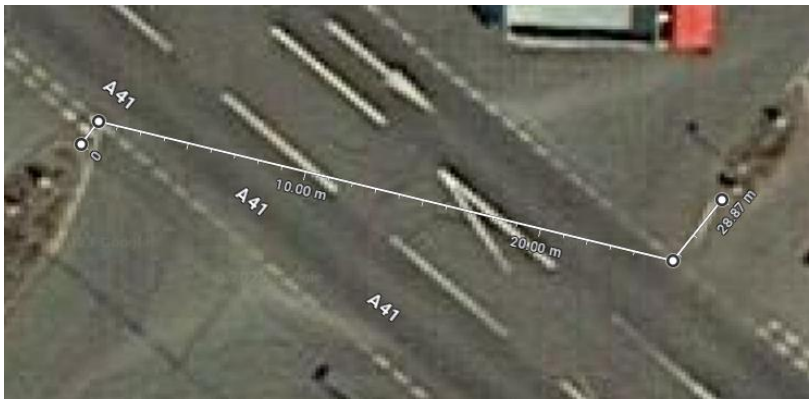


Figure 18 Cluster Site 5 Warrant Road Junction (Source: Google Maps)

6.6.14 Correction of this difference in the positioning of the island could be carried out as part of future maintenance.

6.6.15 For ghost islands used to create right hand turn lanes, the design speed of the road dictates the taper of the carriageway widening as well as a deceleration length given in Table 11. The taper length should develop:

1) *Symmetrically on straight sections of road.*
2) *Asymmetrically towards the outside of the curve on curved sections of road.*
3) *Asymmetrically away from the climbing lane on climbing lane sections* (DMRB CD123, 6.1.2).

DESIGN SPEED	DECELERATION LENGTH	TAPER RATIO
40	40	1:20
50	55	1:25
60	80	1:30

Table 11 Ghost Island Arrangements (DMRB CD123, 6.1.1)

6.6.16 The width of the right turn lane should be at least 3m if possible but no less than 2.5m whilst the width of the through lane should remain consistent.

6.7. Traffic Signs

Siting

6.7.1 Appropriate hazard warning signage and ensuring drivers are well briefed on approaching hazards is important in reducing collisions for the A41. The longer a driver has to react to a hazard the longer they have to reduce their speed accordingly (TSM Ch.1, 5.2.1). Guidance on warning sign sizes and siting distances have been provided in Appendix C. The first consideration was consistency of existing signage including the use of signage for different directions and the siting distance, height and size of sign used. Signs of an incorrect size are more likely to be missed if too small or hit if too large and many signs were found with damage, assumedly from passing farm equipment or HGV's. Consequently, these are important factors to get right that will reduce the maintenance burden and keep assets in a working condition

6.7.2 As most of the route's length has a design speed of 40 or over, the majority of sign sizes, siting distances and visibility distances relevant to the A41 are shown in Appendix C in bold. For sections which have recently had a change in speed limits, none of these involved an increase in speeds and so there are no issues with signs being too small or too close to a hazard from recent schemes.

Warning Signs

6.7.3 Priority junction/bend hazard signs are the most common to be found along the route and were found to be the majority type of hazard for cluster sites. Consequently, these and their variants in Figure 19 should be used for every priority junction and bend of radius under 500m, applied to both sides of the road for full consistency.

Figure 19 Crossroads/Bend Ahead Hazard Signs (TSM Ch.4, 2-2, 3-1)

6.7.4 Where there is a combination of compounding factors that increase the likelihood of a signed hazard experiencing a higher chance or severity of collisions, then it would be prudent to provide additional strength to the warnings. A tiered system specifically for hazard signage is recommended in Table 12 to aid in providing drivers with consistent messaging that provides adequate warning. A similar methodology was employed as part of the treatments to bends for the A49 shown in Table 7. This is targeted at reducing collisions occurring at bends, crossroads and hazardous junctions.

HAZARD SEVERITY	BEND/JUNCTION SIGN ARRANGEMENT
Tier 1	Hazard signs provided as a pair on both verges
Tier 2	Yellow or grey backing plate added
Tier 3	'Reduce speed now' plate added

Table 12 Recommended Hazard Signing Tier Arrangements

6.7.5 The standard tier 1 hazard signage should just be the normal warning signs as above. A yellow (or grey) backing plate to help signify the danger of the hazard should be used for hazards which require a greater deal of care than normal. These are already somewhat common along the route and so would fit in well as the tier 2 hazard treatment. Finally, for difficult and dangerous hazards with a clear history, 'reduce speed now' notation plates shown below in Figure 20 should be added as a tier 3 option for the few most serious and dangerous arrangements along the route.

Figure 20 'Reduce Speed Now' Notation Plate (TSM Ch.4, 2-9)

6.7.6 There will be sections where multiple junctions exist closely together in which case the standard treatment of a hazard sign with a normal siting distance would be confusing or result in queued up signs one after the other. In such cases the correct siting distance to the first junction should be used and then the following junctions should have a reduced siting distance and the addition of a distance plate, ideally 150 yards. There are some hazard signs with 100-yard distance plate along the route and when the speed limit is unrestricted these are likely too close and should only be used where necessary.

6.7.7 For the few roundabouts along the route, they all have straight approaches with good visibility, often with lighting and have not experienced many serious or fatal collisions. As a result, the roundabout warning sign is rarely provided and is unlikely to provide much benefit. It is suggested that these be exempt from the tiered hazard system and be left as is.

6.7.8 Chevron signs shown in Figure 21 are currently used at roundabouts and bends, no locations were found where they should be present and were not used. These should be mounted at a height of 1m to the bottom edge of the sign and have a directional arrow when used at a roundabout centred with the chevron sign itself.

Figure 21 Chevron Sign (TSM Ch.4, 3-8)

6.7.9 Guidance presses for care in their use to be consistent (TSM Ch.4, 3.4.1) and an example of this for correction is the small chevrons used at the bend north of Sandford Farm in Figure 22 which has 4 facing northbound but no equivalent facing southbound. Although the outside of the bend is slightly wider, this should not result in a difference where they are used in only one direction.

Figure 22 Sandford Farm Single Chevrons with Non-Standard Border (Source: Google Maps)

6.7.10 Several locations also use several small signs with a single chevron, whilst guidance suggests that fewer larger signs with at least 2 chevrons would be more appropriate as they will be visible from a greater distance. Currently many of them also have a thin yellow border but guidance requires the thickness of the yellow plate to be at least half the thickness of the white chevron, (TSM Ch.4, 3.4.3) which these are not. This would be a relevant note to make for their eventual upgrade or maintenance in the future to correct or replace but is not seen as a priority.

6.7.11 Hazard markers are not used extensively along the route and are mostly found at bends in conjunction with chevron signs. Although a range of heights, shapes and sizes are allowed, it is best for consistency to select

and use a single variation going forward with black and white banding which is most suitable for rural areas and which appears to already be the common choice. No additional recommendations have been made for these.

6.7.12 The A41 has a short dual carriageway section which can have relevant signage. The 'start of dual carriageway' signs as in Figure 23 are useful both for informing drivers of the road change but also for appeasing drivers who may be attempting to overtake rashly and encouraging them to wait for the dual lane.

Figure 23 Dual Carriageway Ahead Sign (TSM Ch.4, 5-5)

6.7.13 Currently both directions only have one '2 miles ahead' sign. As the Ternhill roundabout is situated between this sign. An additional sign with '1 mile ahead' notation would be beneficial to allay aggressive overtaking from the significant traffic coming off the roundabout. For southbound traffic this is even more relevant as the stretch of road before the dual section is far less open to overtaking and an additional '1 mile ahead' sign would likely offer a similar benefit.

6.7.14 There is one location at Sandford farm where amber lights are in use for a cattle crossing. These have received recent upgrades as part of another scheme and have not been considered any further as no other locations were identified as suitable for their use.

6.7.15 The site visit also identified just a few farm traffic hazard signs (Figure 24) which is not in line with the number of working farms and field accesses the route has. TSM guidance suggests that they should be used where farm vehicles frequently travel at low speed or turn in or out. No data or resources are available to ascertain if their current usage is appropriate in relation to where they are currently used or where they are not.

Figure 24 Farm Traffic Hazard Signage (TSM Ch.4, 9-13, 9-14)

6.7.16 It is likely beneficial that a round of communication or consultation with the local farming community be undertaken to identify whether there are locations heavily used by agricultural vehicles or where drivers of such vehicles have experienced near misses. It is worth noting that the collision analysis of the technical note did not identify any examples of this in the collision data, suggesting that currently no additional signage is required.

6.7.17 Using the DfT flood risk mapping tool ten locations were identified where a flood risk across the highway was prevalent shown in Table 13. Four of these locations have an interface length of 4m and so would not likely require a sign. The remaining six locations are all flood zone level 3 which is high risk.

Figure 25 Ford and Flood Hazard Signage (TSM Ch.4, 10-1, 10-2)

6.7.18 High risk locations will benefit from the appropriate hazard signing shown in Figure 25 if they do experience flooding. This would either be the Ford sign supplemented by the additional notation 'Road liable to Flooding' which will be for most cases or the Flood sign with no text if the hazard is expected to recur regularly (TSM Ch.4, 10.1.1). It is suggested that these only be added once consistent flooding is taking place to avoid overuse. Observations of such existing signage along the route indicates this is likely being used correctly.

6.7.19 Slippery road hazard signs shown in Figure 26 are used frequently along the route, some with notation and others without. Although it will have been justified why they were initially installed at each location at the time. Guidance states that:

'*Care must be taken not to over-use the sign, or its credibility will be undermined. Remedial works to improve the skidding resistance of the road surface or to improve drainage should be undertaken as soon as practicable and the signs removed on completion of the works.*' (TSM Ch.4, 11.3.1)

6.7.20 Guidance also states that:

'*The skid resistance at the location of all existing slippery road warning signs shall be reviewed to determine whether the sign is still needed.*' (DMRB CS228, 7.3)

Figure 26 Slippery Road Hazard Sign (TSM Ch.4, 11-4)

6.7.21 Consequently, it is important that the numerous signs currently installed along the route all have corrective treatments planned, either lined up with normal maintenance or implemented in specific schemes to tackle the problem and ensure the signs are to eventually be removed. It is recommended that a review of these signs be done to cross reference with the forward programme of works provided for both authorities as currently neither appears to have works planned to tackle many of the existing signed locations.

6.7.22 Currently for example, there is one section with notation for 4 miles attached to it that runs through Chetwynd but the road surface and drainage along much of here seems to be of good condition and the charts in Appendix A do not chart any deficient section close to 4 miles in length. It is unlikely drivers are paying heed to that warning for the full 4 miles and it is unclear what necessary treatment will be implemented in the forward programme of works provided.

VAS (Vehicle Activated Sign)

6.7.23 Guidance states that:

'Vehicle- activated signs should not be considered until the fixed signing and road markings have been checked to ensure that they comply fully with the guidance in this chapter and in Chapter 5 in terms of correct size, siting, visibility and condition.' (TSM Ch.4, 1.7.1)

6.7.24 It is understood that VAS signage has been installed previously on the A41 but has been partly removed due to maintenance costs. Future usage would therefore require significant and clear justification. This is not borne out in the collision data showing any consistent trend of speeding as a contributory factor.

6.7.25 Currently VAS signs see use in a few limited locations such as Woodcote village and Sandford farm which both have compounding factors justifying their use which aren't otherwise seen together across the route overall. Since from the existing analysis carried out thus far no locations have been identified with speed being a clear issue, nor being found to have a significantly severe history, new VAS signage is currently not justifiable for any new location.

6.7.26 Looking forward, since the existing road is of a suitable design already, then if new collision data was to show speed becoming a clear factor at a given location, as most locations likely already meet TSM Ch.4's requirements then installation of a VAS would likely be a relevant option.

6.8. Flooding And Drainage

6.8.1 Flood risk mapping data was captured for the A41 and overlaid with the section in scope. Several sections along the route were found to be at risk of flooding shown in Table 13.

NAME	EASTINGS	NORTHINGS	ZONE LEVEL	INTERFACE TYPE	INTERFACE LENGTH (M)
Tong	379472	307401	3	culvert	28
Norbroom Park	375445	319986	3	culvert	150
Newbridge Cottage	374722	320720	3	verge	520
Southern A518 Roundabout	375905	318253	3	verge	1500
Standford Bridge	370429	323746	2	bridge	4
Shakeford	367760	328391	3	culvert	4
Rosehill	365618	330454	3	culvert	50(x2)
Riverside Drive	363907	331930	2	culvert	4
Chapel Lane	363027	332775	3	culvert	4
Ashford Grange Toilets	360161	333789	3	culvert	87
Sandford	358053	334053	3	culvert	138

Table 13 A41 Flood Risk Locations

6.8.2 Flood risk zone 2 is estimated to have a 0.1% - 1% chance of flooding from rivers in any given year whilst zone 3 is found to have a chance greater than 1%. The interface length is the distance along the road with which the mapping shows the flood to occur. As a result, it is expected that some form of flooding is likely to occur possibly a few times a decade. For the sections with a short interface length of 4m the road may still be useable during a flooding event, but for the rest it is important to recognise that a severe event would likely flood such a long section of road that it could not safely be crossed. The principal sources of flooding are from watercourses and surface water inundation (inadequate drainage).

6.8.3 Two types of flooding events were observed from Table 13. The first is expected to relate to watercourses overcoming culvert capacity, with an example shown below.

Figure 27: Culvert Overcapacity Event Near Bletchley (Source: Floodmaps)

6.8.4 This shows two flooding events, both appearing to be caused by a small watercourse surpassing the capacity of a culvert crossing below the road. To the north the flood map suggests that the drainage system discharging to the watercourse is backing up due to surcharge at the outfall, causing flooding of the carriageway. To the south the flood map suggests that the watercourse maybe overtopping the carriageway.

6.8.5 The second type of event identified has an example located just south of the southern A518 roundabout pictured below.

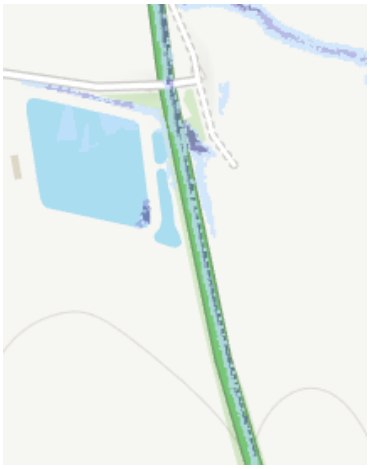


Figure 28: Independent Carriageway Flooding (Source: Floodmaps)

6.8.6 This appears to show a long section of carriageway that would become flooded and retain water, independent of any nearby water source. This points to poor carriageway drainage which could be due to inadequate crossfall, inadequate gully provision or inadequate carrier capacity or a combination of these.

6.8.7 Shropshire Council provided a recent bridge inspection report carried out on culvert no.2 at Shakeford farm. The following relevant comments by the inspector were made:

- *'The culvert has partially collapsed, causing the crown to be misshapen throughout the culvert. There are deep open joints and occasional missing bricks throughout.*
- *Foundations NI but settlement to arch leads to some concern regarding the condition of the foundations, additionally there was minor settlement to the carriageway.*
- *The owner of the yard to the upstream end of the culvert informed inspectors of frequent flooding to his properties which has led to him receiving complaints from his tenants. The property owner believes the most likely cause of the flooding was due to settlement of the carriageway causing water to miss the nearby gully and flow into his yard instead.'*

6.8.8 The culvert was then given the following scores:

- *'The BCIav score is 63.65. This score places the structure in the 'Poor' portion of Table 19. This score is considered appropriate given the partial collapse throughout the culvert and the downstream headwall.*
- *The BCIcrit score for the structure is 0.00 due to Cat 5 score given for the partial collapse of the culvert. This score suggests the culverts capacity may be severely affected; this score is considered appropriate.'*

6.8.9 The recommendation was made to install a new culvert at an estimated cost of £155,000 and that the frequent flooding to the upstream end reported by the landowner is of concern, possibly requiring additional works. It is important to recognise that the culvert failed the inspection and consequently, it is likely that due to the age of some sections of the road that other structures will exist in a similar state. It is recommended that a review of other similar assets be done to ensure that they have all been adequately surveyed to ensure an accurate picture is maintained as per (DMRB CS551, 4.1) and that future flooding events are not worsened by the failure of aging structures.

6.8.10 In addition to the locations listed in Table 13 it is recommended that the flood maps are reviewed to identify other locations of flooding of the carriageway. Where the flooding is related to a culverted watercourse crossing consideration should be given to increasing the capacity of the culvert. Where the flooding appears independent of a culverted watercourse crossing consideration should be given to upgrading the drainage provision.

6.8.11 Overall, it appears drains are consistently located along the carriageway edge with the one exception covered in cluster site 12. Unfortunately, no asset data was available containing full geographical or status information on drains, gulleys, or culverts across the route and so a review of existing drainage asset condition has not been possible.

6.9. Safety Cameras

Speeding Offence Analysis

6.9.1 Speed data has been supplied by WMP for 15 locations, as covered in the technical note speed analysis 4 locations were then identified which recorded the 85th percentile of vehicle speeds to be above the speed limit for that section and are given in Table 14 below.

LOCATION	DATE	SPEED LIMIT	AVERAGE	85TH PERCENTILE
A41 Prees Higher Heath	Apr-23	50	48	**54**
A41 Tern Hill	Jul-22	40	39	**44**
A41 Shakeford	Sep-22	60	55	**62**
A41 Gorsey Bank	Jun-23	60	55	**62**

Table 14 Speed Data Records 2023

6.9.2 Notably, no location has recorded an 85th percentile speed that is over 5mph above the speed limit which is the threshold set out in Table 18.

6.9.3 WMP have provided additional data on the site locations of their safety camera operations as well as the most up to date summary of prosecutions for each location. It is important to note that the assumption must be made that each visit is of equal value however it is understood that this will naturally not be the case, such variations include visits at different times of the day/year or length of time per visit. It should also be understood that the specific locations between where the speed recording was done and where safety camera visits are carried out do differ between the same named location. Table 15 below has out-of-scope locations removed and the average number of offences per visit calculated.

LOCATION	SPEED	AUT	NO. OF VISITS	OFFENCES	OFF. PER VISIT
A41 Hinstock By-pass	60	S	15	151	10.1
A41 Tern Hill	40	S	26	106	4.1
A41 Bletchley	70	S	35	269	7.7
A41 Tern Hill (Chapel Lane)	60	S	12	45	3.8
A41 Higher Heath	50	S	5	5	1.0
A41 Gorsey Bank	60	S	23	73	3.2
A41 Chetwynd Firs	60	T	3	5	1.7
A41 Lane End	60	T	6	3	0.5
A41 Newport	60	T	2	2	1.0
Total	-	-	221	1475	6.7

Table 15 Safety Camera Offences 2023 Summary

6.9.4 When looking at the top 4 locations for total number of offences recorded and by offences per visit, there is a clear peak occurring between Hinstock and Bletchley. In part this will be expected as this stretch experiences the greatest volume of traffic and the location with the highest number of visits recorded the highest number of offences. Overall, it is difficult to draw clear conclusions from this data other than the fact that the 4 locations found to have the most offences per visit tend to be straight sections which is to be expected.

6.9.5 It should be distinguished that the safety camera visits are not carried out equally and so some locations have barely any datapoints to draw from. This is possibly because the locations which experienced the greatest number of speed enforcements are visited more often as shown by Table 16 below by the 4 locations with very few visits yielding very few offences recorded.

LOCATION	SPEED	AUT	NO. OF VISITS	OFFENCES	OFF. PER VISIT
A41 Higher Heath	50	S	5	5	1.0
A41 Chetwynd Firs	60	T	3	5	1.7
A41 Lane End	60	T	6	3	0.5
A41 Newport	60	T	2	2	1.0

Table 16 Safety Camera Locations with Few Visits

6.9.6 It might be expected that the 4 locations with uncompliant speeds would roughly tend to yield more offences per visit on average, but this is not the case. Shakeford has no equivalent safety camera location but Gorsey Bank, Higher Heath and both Ternhill locations all average a lower number of offences per visit than the average of 6.7. The 2 locations which yielded the most consistent number of offences per visit both had compliant speeds at the 85th percentile as given in Table 17 below.

LOCATION	SPEED	85TH	OFF. PER VISIT
A41 Hinstock By-pass	60	60	**10.1**
A41 Tern Hill	40	**44**	4.1
A41 Bletchley	70	70	**7.7**
A41 Higher Heath	50	**54**	1.0
A41 Gorsey Bank	60	**62**	3.2
A41 Shakeford	60	**62**	No visits

Table 17 Uncompliant Locations with Highest Offence Rate

6.9.7 Initially, consideration was made for whether the number of junctions at the locations were having an effect however no trend was found. Notably, Higher Heath and Gorsey Bank are both locations which have a low number of offences per visit but experience a higher average of noncompliance and were found to be in a poor overall condition with long stretches of poor road surface, worn or missing road markings and few studs. Conversely, Bletchley and the Hinstock by-pass are in good condition with highly visible markings, consistent studs and no surface issues as well as being near to a stretch of either some form of widened centre or additional lane. They also witness a moderately higher than average traffic volume. As a result, this combination may increase driver confidence at those locations resulting in an increase in the average rate of offences recorded per visit.

6.9.8 What this would not explain is why these 4 locations with fewer offences per visit also witnessed an uncompliant average speed. The effect of higher driver confidence could result in a minority of vehicles being driven significantly beyond the speed limit and are consequently recorded offending as such, but the overall average is lower due to another factor not yet determined. Section 4.3 of the Collision Analysis Tech Note carried out an inverse cluster analysis which looked at the relative changes to collision types when removing the collisions identified within cluster sites. Whilst the overall conclusion of this analysis was inconsequential, it did show that records of injudicious actions reduced by 12.5% outside clusters, bringing that ratio much closer to the national average. This implies that outside its cluster sites, the A41 is closer to the average rural road in the UK than otherwise appears and is further backed up by most of the other contributory factors in Table 25 of the Tech Note (impairment or distraction, behaviour or inexperience and road environment) also tending in the same direction.

6.9.9 Furthermore, a higher ratio of the collision types for bad overtakes and loss of control were identified outside of cluster sites. Whilst this could point towards an increase in the types of event related to high speeds or speeding, this would need further supporting evidence relating to speeding which is not found. What was concluded is that as overtaking is banned or clearly dangerous at many junctions or cluster sites, overtaking would be expected to occur less frequently at these locations. Additionally, junctions are expected to be locations where vehicles are slowing down and drivers are paying attention with the expectation of carrying out a manoeuvre. The expectation is that these are not locations where loss of control would be more likely.

6.9.10 It is recommended that a deeper analysis of the speed data at these 4 locations be carried out by vehicle type and time of day to ascertain if it is one of these metrics that provides a trend. If it is a specific demographic that can be identified a targeted campaign could be a cost-effective method to improve compliance. Finally, as the Shakeford location has been recorded as being an uncompliant location, it is suggested that a suitable moving safety camera location be established on that stretch in the future.

Average speed cameras

6.9.11 Average speed cameras can be used to control speeds and smooth traffic flows. Their cost although high compared to other measures has reduced in recent years. Clear justification needs to be made for their use and the associated cost. Based upon the collision and speed analysis alongside the wider assessment of the route made in this report here the following observations are made:

1. Only three collisions within the study area within the last 5 years have speeding recorded as a factor.
2. All four locations with uncompliant 85th percentile speeds are spread out across the whole route. Each location would require its own pair of start and end cameras.

3. If used more widely to cover cluster sites and across the route more consistently the overall numbers of cameras required would be significant.
4. The are a high number of private accesses and junctions which results in vehicles joining and leaving within zones.

6.9.12 Although dated, guidance by DfT clarifies a cameras role:

"Safety cameras provide a valuable and cost-effective method of preventing, detecting and enforcing speed and traffic light offences." (DfT Circular 01/07, 2)

6.9.13 Recommendations are also made for how sites should be selected:

"For selecting potential camera sites, it is recommended that analysis of collision data should be undertaken over a minimum period (e.g. most recent 3 years, or preferably 5 years) to determine whether a camera is an appropriate solution to reduce speeds and/or collisions at that site. Average (mean) and 85th percentile speeds should also be collected so that the data is not more than 12 months old. This will help to demonstrate the level of non compliance with the speed limit, which itself should also have been constant over the same minimum period." (DfT Circular 01/07, 22)

6.9.14 As well as the specific circumstances relevant to average speed cameras:

"Average speed camera sites (fixed) – this type of enforcement has the effect of calming the speed over a longer distance and can be used at sites where a significant number of collisions are scatted along a length of road and for major road works enforcement." (DfT Circular 01/07, 32)

6.9.15 This guidance highlights the site selection criteria that applied at the end of the National Safety Camera Programme, the relevant parts have been tabulated in Table 18 below:

RULE	FIXED SPEED CAMERA SITES	ROUTES
1) Site or route length requirements	Between 0.4km and 1.5km	Between 5km and 20km
2) Number of KSI collisions	At least 3 KSI collisions per km in the baseline period. (36 months)	A minimum of 3 existing core sites within the length. OR Has at least 1 KSI per km average in the baseline period*
4) 85th percentile speed at proposed sites	Speed survey shows free-flow 85th percentile speed is 5mph over maximum speed limit in non-built-up areas. This can apply to all vehicles or a vehicle class but must be compared consistently.	
6) Suitability of site for camera enforcement	The highway authority must undertake a site survey, demonstrating the following: a) The speed limit has been reviewed, confirming that camera enforcement is the right solution. b) There is no other cost-effective engineering solution that is more appropriate. c) That the Traffic Regulation Order (where applicable) and signing are lawful and correct.	

Table 18: NSCP Site Selection Criteria

6.9.16 With consideration to DfT's Circular, the purpose and conditions that would justify an average safety camera are not present. From the data provided in the Technical Note, the route as a whole only experienced a total KSI of 9.6 over five years (60 months) of a 43km route. This puts it far below the 1 KSI per km average over 36 months that the National Safety Camera Programme would have required.

6.9.17 Attempts to pick out smaller sections with a higher KSI history would still not come close to this requirement. Regardless, any section would also fail to meet rule 4 requiring the 85th percentile speeds to be 5mph above the speed limit. This has already been proven by Table 14 to never be the case for any of the recorded locations. Finally, it should be reiterated from the Technical Note analysis that speeding was only recorded in three collisions total, and that is the primary issue that safety cameras aim to address. Therefore, based upon collision, speed data and assessment of the relationship between the two there is no clear justification for the use of average speed cameras on the A41. No part of the route is experiencing speeding such that adoption of average speed cameras would be justified. The above recommendation to carry out further analysis of the four identified locations should be completed, which may justify a behavioural intervention alongside the inclusion of a new mobile camera location.

6.10. SCRIM Data Analysis

Existing Investigatory Levels

6.10.1 Data for the latest SCRIM (Sideway-force Coefficient Routine Investigation Machine) survey used to measure the wet skidding resistance (PSV) of the A41's road surface was provided by Shropshire Council dated May 2023. This covered 656 datapoints split into 100m sections along the route excluding the TWC stretch and have been charted in Appendix A.

6.10.2 Guidance provides the following table for recommendations to minimum investigatory levels (IL, used to identify sections for review) of skid resistance for relevant site types defined as either low risk (LR) or with significant traffic (ST) (DMRB CS228, 4.2). This was cross referenced with the investigatory levels being used in the data provided. The last column is the number of occurrences for each type of site category from the Shropshire data. The values underlined in bold are the current IL Shropshire has set using its own skidding resistance policy, which were provided in the dataset. Some of the site categories matched the guidance, those that may not are also shown in bold in Table 19 below.

SITE CATEGORY	PSV FOR LOW RISK (LR)	PSV FOR SIGNIFICANT TRAFFIC (ST)	CATEGORY OCCURRENCES
Non-event carriageway with one-way traffic	**0.30**	0.35	36
Non-event carriageway with two-way traffic	**0.35**	0.40	485
Approaches to and across minor and major junctions, approaches to roundabouts and traffic signals	-	**0.45**	41
Roundabout	-	**0.45**	0
Gradient 5-10%, longer than 50m	-	**0.45**	53
Bend radius <500m – carriageway with two-way traffic	**0.45**	0.50	41

Table 19 Skid Resistance Investigatory Levels (DMRB CS228, 4.2)

6.10.3 The site categories in bold that may potentially require a higher IL make up 526 out of 656 datapoints in total. This may highlight an issue as it is unlikely that every data point for a bend should only be set at the low-risk rating when multiple bends along the route have already received numerous treatments including double hazard signage with extra notation, chevron signs and double white lines and have a radius significantly below 500m. The same can be said for two-way traffic carriageways which make up most of the route but carry many accesses, junctions and other hazards. Currently all of these datapoints are set to the low-risk value only which accounts for 80% of the entire route and is likely to require more variation.

6.10.4 Because the datapoints cover a 100m section, and there are many approaches to junctions and roundabouts, it is difficult to count how many of these sections should exist. Unfortunately, the SCRIM data is separated from the location data and so this could not be cross-referenced with existing slippery road hazard signage seen on the site visit. What can be noted is that the occurrence of approaches to major junctions and roundabouts is equal to that of bends, yet there are far fewer bends overall. It would be expected that this occurrence should be higher or is mixed in with higher values for the two-way carriageway.

6.10.5 The existing IL will have been set years previously when the road did not carry as much traffic and the analysis picture was likely very different. The latest set of traffic flow data available from the DfT shows an AADT

(Average Annual Daily Traffic Flow) of between 7300 and 19600 shown below in Table 20 moving from south-north.

LOCATION ID	AADT
57108	**9497**
56383	**13064**
73931	**13064**
7114	**19621**
74001	**15950**
38197	**15950**
74002	**15950**
48181	**10117**
73939	**10117**
6444	**7327**

Table 20 DfT Averaged Traffic Flows 2018-2022

6.10.6 These values are averages from 2018-2022 covering the pandemic years which saw a significant drop in traffic volumes whilst National Highways projections are that nationwide traffic flows are expected to continue to rise in the future. Consequently, it is likely that the current low risk PSV values used are insufficient for parts of the route where the traffic is heaviest.

6.10.7 Guidance defines the low-risk values in the following way:

'LR in cells indicates a lower IL that may be appropriate in lower risk situations, such as low traffic levels or where the risks present are mitigated by other means, providing this has been confirmed by the crash history.' (DMRB CS228, 4.2.2)

6.10.8 The factor analysis in the technical note identified that road environment has a 19.4% occurrence in the collision data compared to a national average of just 10.6%. It is therefore likely that several areas have a crash history with the road environment being recorded as a contributory factor. The analysis also identified that only 6 collisions total were recorded for slipperiness as a contributory factor. However, this should be balanced against the fact that 40% of all fatal collisions occurred in wet conditions as did 38% of all slights.

6.10.9 Considerations have been made for whether the current Shropshire IL, (which matches the low-risk PSV in DMRB) is maintained across all 526 sections as some will have a combination of high traffic volumes, consistent hazards and a history of severe collisions and what factors should be used to determine a departure from the default value. The recommendations are as follows.

6.10.10 Bend sites should have the IL increased to the ST value if:

- A bend has a radius below 150m requiring lane widening or has a radius below 200m with a lane width of 3m.
- A bend makes use of tier 3 hazard signage with yellow plates and additional notation.
- A bend makes use of tier 2 hazard signage and carries an AADT over 20,000.
- A bend carries an access or junction on the inside.
- A bend has a collision history of at least 2 serious or fatal collisions in the last 5 years.

6.10.11 Non-event carriageways with two-way traffic should have the IL increased to the ST value if:

- The section has 4 or more accesses or junctions in proximity.
- The section makes use of tier 3 hazard signage with yellow plates and additional notation.
- The section makes use of tier 2 hazard signage and carries an AADT over 20,000.
- The section forms part of an area within a slippery road hazard warning.
- The section has a collision history of at least 3 rear shunts in the last 5 years.

6.10.12 Thirdly, any sections using the LR value should be changed to the DMRB ST value, if the AADT for that section is above 20,000 and has a recent collision history of any serious or fatal collisions.

Existing Skid Resistance

6.10.13 The measured SCRIM value was compared with the IL set in DMRB CS228, 4.2 and used to calculate the SCRIM deficiency value which was then charted in 3 sections for readability and shown in Appendix A. SCRIM deficiency is the difference between the SCRIM value recorded and the set IL for a given section. The charts show several areas were measured below the Shropshire IL. It is recommended that a risk assessment be carried out as per local policy.

6.10.14 Locations which upon assessment are found to have a clear deficiency should have a slippery road hazard sign provisioned for the stretch in question with additional notation for the relevant distance.

6.11. Whole Route Treatments Summary

6.11.1 The recommended whole route treatment proposals have been summarised and categorised in Table 21 below.

CATEGORY	TREATMENT
Carriageway Design	- Aim to maintain verge, hard strip where possible. - Introduce edge lines where hazards present.
Centre Lines	- Maintain using warning lines in advance of junctions and roundabouts only to highlight them as hazards. - Consider hatched line for Wistanswick section.
Double White Lines	- Expand at identified locations to provide sufficient coverage. See Appendix D.
Edge Lines and Studs	- Introduce at missing sections to narrow overly wide carriageways, delineate accesses and highlights bends . See Table 8 and Section 6.2. - Consider green studs at accesses for improved night visibility.
Private Accesses	- Introduce marker posts and edge lines. - Encourage safe visibility arrangements.
Junctions	- Consider corrections to minor road widths, corner radii, and angle of approach in line with DMRB, dependant on design vehicle applied to listed junctions - Provide improved visibility to reduce risk of collisions.
Traffic Signs	- Tiered warning sign system to standardise hazard severity. See Table 12. - Standardise chevron and hazard warning signage and usage. - Identification of slippery road signing actions to be taken.
Flooding & Drainage	- Further location mapping of flood zones and failure types recommended. - Identification of aging flood and drainage infrastructure pointing to further surveys or remedial works that are likely necessary.
Safety Cameras	- Speed is only considered a contributory factor in a small number of collisions. - Locations with highest offence rate do not align with poor speed compliance. . - Route arrangement would require significant number of average speed cameras for effective use. - Other measures would be more effective.
SCRIM Data	- Recommended changes to Shropshire's current IL levels. - Identified deficient areas for further investigation to be undertaken at the next review.

Table 21 Whole Route Recommendations Summary

7. Cluster Site Treatments

Overview

7.1.1 The work carried out in the technical note identified 15 possible collision cluster sites. Of these, ten were then found to benefit from specific treatments outside of the general whole route solutions given in Table 20 at the end of section 6. The collision analysis and a more detailed review of the road layout are given for context. These have then had more detailed site assessments and recommendations provided for each site.

7.1. Cluster Site 2 - Green Lane

Collision Analysis

7.1.1 The Green Lane cluster site has only experienced two recent collisions which were both rear shunts, but for different reasons. One of which involved a stationary vehicle waiting to turn into Green Lane which is correctly signed for. The other involved a vehicle turning into one of the private accesses and the following vehicles were unprepared for this. Consequently, these are not thought to be connected and are shown in Table 22 below.

CRASH ID	YEAR	SEVERITY	CASUALTIES	CONDITIONS	CONTRIBUTORY FACTORS	COMMENT
865801	2019	Serious	2	Dry/Day	405, 406	Rear shunt
1033922	2021	Serious	3	Dry/Day	308,408.409	Rear shunt into head on

Table 22 Cluster Site 2 Collision History

7.1.2 The collision analysis drew no conclusion for this cluster site but the future steps from the technical note were as follows:

'*Consider signing, speed control measures and options relating to multiple accesses.*'

Road Layout

7.1.3 This is a crossroads with the A41 intersected by Green Lane at a slight angle, with a slight stagger in a right-left configuration. The A41 has slight radius with sharper bends approx. 170m to the north and 900m to the south. The junction is constrained to the northeast and southwest by residential dwellings as well as a large motor vehicle garage to the south. The speed limit is unrestricted from both directions and there is no street lighting. There is a wide corner radius at both junctions and drainage provision appears consistent throughout. The B5065 junction is situated 170m to the north.

7.1.4 Warning line with suitably spaced road studs runs through the junction, appropriate edge lines are also present. There is a grass verge with no footways present. The transition to a single continuous white line to prevent northbound overtaking occurs approx. 60m to the north of the junction with two "dolphin" move to the left arrows being present through the junction.

7.1.5 A series of accesses including to a large motor vehicle business, with parking in front of it are situated on the northbound approach. Across the front of these is a short section of footway. Crossroads warning signs with reduce speed now supplementary plates on yellow backing boards are present on both junction approaches. Flag type direction signs are present at the junction but there are no ADS. A route confirmatory sign is situated on the southbound approach following the warning sign. The immediately north of the crossroads is the map ADS for the B5065 junction.

Site Assessment

7.1.6 This section has recently had surfacing, markings and road studs renewed and is in good condition. The following observations are made:

- The northbound ADS for the B5065 junction has the central panel missing.
- The B5065 junction has not been part of the renewal scheme and therefore surface conditions deteriorate here with completely worn markings, almost no stud eyes and poor road surface.

- Visibility on the A41 of vehicles joining from Green Lane is restricted.
- Visibility to the right for traffic entering the A41 from the west is restricted by the fence line.
- Signing through the junction and the B5065 junction to the north are dirty and, in some cases, have been clipped.
- Overrunning for the left turn coming out of the eastern arm.

7.1.7 Although the crossroads currently has junction warning signs, there is no warning of the private accesses, one of which being a sizeable commercial premises centred around vehicles which may see regular traffic. The width of the accesses is also an issue as it makes it harder for those on the main road to know where to expect a vehicle would attempt to join the A41.

7.1.8 The keep left arrows along the centreline occur directly across the junction and directly after it, for northbound traffic this is likely only going to encourage overtaking up to that point. One of the collisions which occurred did involve a head on and was serious, this could have partly been the result of the following vehicle believing overtaking to still be valid here which is why they crossed the centreline to avoid the turning vehicle ahead although it is impossible to confirm this.

Recommendations for Cluster Site 2 - Green Lane

7.1.9 Drawing COMHA1T&W038-AMY-GEN-A41-DR-CH-0010 in Appendix D shows the recommended proposals for this cluster. This part of the route is quite straight and forward visibility is very good, encouraging overtaking for which there are already suitable sections directly north and south. The keep left arrow directly along the crossing point is unnecessary and allows overtaking where there is joining traffic. This in combination with the lack of vision on the minor road approaches means that overtaking vehicles and waiting traffic are blind to each other. It would be beneficial to provide double white lines along a stretch of the centre here, covering the private accesses to the south also. These would be an acceptable compromise over a ghost island and right turn lane for which there is insufficient width.

7.1.10 If green studs were to be placed along the private accesses edge lines. This would pose an issue with the extremely wide access for the conjoined commercial and residential properties as the long row of green studs could appear as a diverge, and so an entrant vehicle could exit the carriageway and hit the brick wall of the dwelling.

Figure 29 Example Wide Access (Source: Google Maps)

7.1.11 Consequently, if green studs are chosen to be used it may make sense to only apply them to the last few metres of the edge line to highlight the private dwelling access.

7.1.12 Furthermore, although it has only happened once recently, a serious collision occurred because of drivers not expecting the private accesses to be used and the lack of warning for them may have been worsened by the crossroads hazard warning signs correctly sited for the crossroads and not before. This may give drivers the expectation that the crossroads is the next or only hazard in the area. Unfortunately, no options for appropriate warning signage exist and so the only additions to be made are marker posts and double white lines as per the whole route treatments.

7.1.13 An option could be to introduce speed limiting measures, likely an extension of the 50mph zone to the north. A speed reduction could reduce the seriousness of collisions occurring and may reduce their likelihood. But the area has many private accesses and a solution that may only dampen the impact of one of the most common collision types is not seen as ideal. With only one collision recently recorded for this junction, it is unlikely such an option is beneficial over the downsides.

7.2. Cluster Site 4 - Ternhill roundabout

Collision Analysis

7.2.1 Cluster site 4 at Ternhill Roundabout has experienced five rear shunts, three bad turns into the roundabout and one incident of an errant vehicle entering the roundabout the wrong way which has been ignored. Given in Table 23, the recurring theme found in these collisions revolves around driver focus and judgement. Although a lack of vision was often commented on in the reports for bad turns, the visibility at the junction is excellent as the roundabout is very low with no obscuration by vegetation. Ensuring that drivers are paying attention to what is important, either directly in front of them or the direction of incoming traffic appears to be the important factor to treat here.

CRASH ID	YEAR	SEVERITY	CASUALTIES	CONDITIONS	CONTRIBUTORY FACTORS	COMMENT
332883	2018	Slight	1	Wet/Day	103,308,410	Rear shunt
858200	2019	Slight	1	Dry/Day	405, 605	Bad turn, vision
897702	2019	Slight	1	Wet/Dark, Lights	103,307,410,510	Wrong lane, Head on
1028206	2021	Slight	2	Dry/Day	308,406	Rear shunt
1210771	2022	Slight	1	Dry/Day	405,701	Bad turn, vision
1221012	2022	Slight	1	Dry/Day	405	Rear shunt
1313598	2023	Slight	2	Dry/Dark, Lights	405,406	Bad turn
1144021	2022	Slight	1	Wet/Day	103,308,405,709	Rear shunt
817778	2019	Slight	2	Wet/Day	103,308,408	Rear shunt

Table 23 Cluster Site 4 Collision History

7.2.2 The collision analysis concluded that this cluster site had issues involving driver vision, driver focus and misjudgements. It also had future steps noted as the following:

'Pedestrian safety is of concern, review crossing options including signalised crossing. High visibility and low deflection give too much confidence to drivers and impacts speeds. Mitigating measures to be considered.'

Road Layout

7.2.3 Ternhill is a four-arm roundabout providing the intersection between the A41 and A53. The junction and its approaches are lit and subject to the national speed limit. There is little deflection on the approaches. The traffic islands on each of the four arms are not raised to accommodate an abnormal load route. There are uncontrolled pedestrian crossings on all arms, these are a mixture of poorly aligned, damage or overgrown tactile paving.

7.2.4 Going northbound the roundabout has an ADS positioned just after a long taper for a ghost island. Just as the road straightens out the carriageway edge line disappears and widens out with merge arrows along the centreline. The centreline then tapers into a traffic island with some hatched marking which holds tactile paving for the pedestrian crossing. A footway runs along the nearside verge for all 4 corners of the roundabout which holds directional signage and chevrons with a yellow backing plate.

7.2.5 The southbound approach is also very straight and has an east side priority junction and footway before a large ADS. Close to the roundabout there is an access for a fuel service station and a footway begins on the western side here also. The carriageway has no edge lines along this stretch and the centreline tapers out into a traffic island with hatched marking identical to the northbound approach.

Site Assessment

7.2.6 Although the centrelines here are in serviceable condition the traffic island outlines and hatching are well worn and covered by debris and deposits which have built up from the heavy traffic. As the traffic islands are not raised, the pedestrian standing, especially the tactile paving is partially obscured by deposits and in very poor condition. The island bollards are dirty, and the surrounding footway has broken surfacing in parts.

7.2.7 The last 50m of the southbound approach appears to have had every stud casing filled in, leaving no studs on the final approach at all. The large ADS on the northbound approach is slightly obscured in the corner which blocks out the 'Hodnet' direction text. There does however appear to be sufficient drainage locations around the junction. Finally, the roundabout chevron signs have a thin yellow border which is uncompliant with TSM Chapter 4.

Future Works

7.2.8 This cluster site is due for future works as part of an existing scheme update by Shropshire. The remedial work involves the installation of queuing traffic ahead and warning signing on the southbound approach. These are secondary phase works coming after the recent completed treatment of reducing the southbound approach from two lanes to one lane alongside some warning signing mentioned in Table 6.

Recommendations for Cluster Site 4 – Ternhill Roundabout

7.2.9 Drawing COMHA1T&W038-AMY-GEN-A41-DR-CH-0011 has been provided showing recommended proposals for this cluster site in Appendix D. It is recommended that any future works incorporate the following direct treatments:

- Replacement of replacement road studs as required.
- Repair and cleaning of the footway including tactile paving and dropped kerbs with re-alignment and corrections where needed.
- The clearing of vegetation.
- Refresh of road markings and addition of boundary lines for the hatching around the traffic islands which are missing.
- Replacement Chevron sign faces.

7.2.10 The traffic islands are flat to handle overrun from vehicles making them an inappropriate refuge for pedestrians. If they must remain flat, then replacement crossings should be installed further from the roundabout to have raised kerbing. Another option would be to raise and expand the existing islands and replace the hatched areas with a raised grass section which would be suitable for a pedestrian crossing but may introduce problems with long vehicles. Vehicle tracking for the junction would be beneficial for deciding this.

7.2.11 Another issue with the roundabout is the site constraints, making it impossible to address both the lack of deflection as well as the consistent queuing due to the high traffic flow. A quick comparison of the approach to Ternhill compared to the other roundabouts used to intersect other A roads shows a stark comparison between Figure 30 and Figure 31.

Figure 30 Ternhill Roundabout Northern Approach (Source: Google Maps)

Figure 31 A518 Roundabout Northern Approach (Source: Google Maps)

7.2.12 Considering that the Ternhill roundabout experiences almost a third more traffic volume than the A518 roundabout, the current layout is unlikely to be suitable if traffic volumes continue to rise. Although the arrangement itself can handle the throughput, the increased traffic will continue to result in a greater degree of constant interaction and queuing, resulting in collisions (although likely to be minor) becoming more and more likely.

7.2.13 Two new arrangements with significant works could be possible, with the first being a conversion of the junction to a signalised crossroads. This would solve pedestrian issues and likely negate collisions involving bad turns, but it has been reported this has been looked at before and there are potential issues with available throughput for the site in such an arrangement. The second major option could be to move the junction to the unconstrained land to the south and rebuild it in line with the arrangement of the other roundabouts on the A41 with a larger centre, deflections, and traffic islands. Unfortunately, this would be an order of magnitude more expensive than any other treatments and would still have an awkward arrangement with the two entrances which are entirely constrained. Such significant works are not in line with the severity of the junction's collision history.

7.3. Cluster Site 5 - Warrant Road

Collision Analysis

7.3.1 This site has had three collisions of the same type involving bad turns. The fourth and deliberate collision was identified as an isolated incident. Shown in Table 24, all three collisions were of a similar nature involving cars on the minor road either misjudging the give way line and coming to rest whilst impeding upon the main carriageway, or pulled out incorrectly, consequently causing a collision.

7.3.2 It has been identified that the collisions might be because the very wide corners were an issue here allowing entering vehicles to sit almost facing their direction of travel and thus were putting themselves in a position where they could not fully see oncoming traffic in the opposite direction. This would especially be the case if they follow the nearside kerb.

CRASH ID	YEAR	SEVERITY	CASUALTIES	CONDITIONS	CONTRIBUTORY FACTORS	COMMENT
1086030	2021	Serious	1	Dry/Dark, Lights	405	Bad turn
1050969	2021	Serious	2	Wet/Day	103,307,403,405	Bad turn
1032221	2021	Slight	1	Dry/Darkness	403,405,602	Bad turn
1017535	2020	Serious	2	Wet/Day	206,403,409,602	Deliberate

Table 24 Cluster Site 5 Collision History

7.3.3 This cluster site had a conclusion in the collision analysis of junction layout being the cause. It also had future steps noted as the following:

'Consider signs and road marking improvements including central ghost island.'

Road Layout

7.3.4 This section is a straight road with street lighting and a right-left pair of side roads and both directions have a narrow footway on the west side. There are constraints on the western and eastern corners due to a nearby military base and residential dwelling. The wide junctions and straight main carriageway allow for forward visibility to meet standards here. However, there is no advance visibility of the minor roads, and the speed limit is unrestricted for both directions.

7.3.5 From the north side there are double yellows here to prevent parking by plane spotters and a staggered junction warning sign with a yellow back plate followed by a large ADS sign. Moving south edge lines replace the double yellows and the centreline begins splaying into a ghost island before a large tourist direction sign.

7.3.6 There two nearside direction and tourist signs before and at the junction and another on the offside after it. The junctions here both have minor road islands with bollards. These islands are different sizes and have an irregular offset from the main carriageway, both contain the minor road give way sign.

7.3.7 Starting south, the verge encroaches upon the offside edge lines and there is a staggered junction warning sign with yellow back plate. The centreline is a widened double line with hatching and directly behind the nearside hazard sign is a pair of private accesses followed by a large ADS and tourist sign for the upcoming junction. Finally, the junction has a identical signing for both turns. The ghost island hatch delineating oncoming traffic is off-centre, leaving southbound vehicles turning west with more space than northbound vehicles turning east.

Site Assessment

7.3.8 The give way markings on both minor roads are well worn and incorrectly aligned with the main carriageway edge lines, (mostly) and should be aligned with the edge of carriageway instead. The minor road traffic islands are also somewhat overgrown with some long grass beginning to sprout and interfere with the visibility of the bottom half of the bollard. The bollards themselves are very dirty and likely to have lost all their retro reflectivity. The Large ADS for northbound is partially obscured by vegetation and the large tourist sign and directional sign afterwards are both somewhat dirty. The northbound edge lines after the junction also have double yellows just painted over the top of them, before the edge line tapers in, tapers out and ends.

7.3.9 The carriageway to the north has a polished surface along the tyre lines showing heavy wear, the hazard sign has rusting on the yellow backing plate and the large ADS has some dirt in the corner as well as the right-side brackets slipping causing gaps on the face. The tourist sign is obscured by greenery and both directional signs at the junction are somewhat dirty. Past the junction the southbound verge encroaches upon the edge lines mostly obscuring it with dirt and the verge has become overgrown right up to the carriageway. This is likely impacting the efficacy of the drains.

7.3.10 The overall quality of the road markings in the centre meets requirements except for the ghost island central diagonal used to delineate where vehicles should turn. This line itself is half worn off implying that northbound vehicles turning right are perhaps needing to swing out further along the painted line than those travelling

southbound. This supports the current analysis that the ghost island is delineated in the wrong place and should probably be moved to the centre of the minor road lanes.

Future Works

7.3.11 This cluster site is due for future works as part of an existing proposed scheme by Shropshire after being internally identified as a cluster site. Funding for improvements has been set aside focusing on updates to the existing warning and directional signage for the junction.

Recommendations for Cluster Site 5 – Warrant Road

7.3.12 Drawing COMHA1T&W038-AMY-GEN-A41-DR-CH-0012 has been provided showing recommended proposals for this cluster site in Appendix D. With collisions involving misjudgement of the give way line occurring, these should be refreshed. The dirty signs will need cleaned and those which are obscured will require clearing of vegetation to ensure they are fully visibility. The southbound hazard warning sign with rust on the yellow area should have its backing plate replaced as well as the mounting brackets for the large ADS which will need to have its panels reseated.

7.3.13 It is expected that the bollards will also need to be cleaned. The unkept verges should be cut back and cleared out to ensure the carriageway is clearly defined and the drains are cleared. The traffic islands will also need to have all green growth removed from them as well as a relocation of the ghost island central hatch which will need to be remeasured to be correctly placed in across the centre.

Considerations for Future Schemes

7.3.14 As this is the only pair of junctions which are so closely staggered and have traffic islands, an assumption can be made that the islands were installed to prevent vehicles from carrying out minor road crossings diagonally rather than properly joining the main road and then taking a left turn. These are likely to be working and should be kept, the difference in offset from the main carriageway does not place either out of compliance, so can be ignored.

7.3.15 Guidance states that the radius of the priority junction corners should be 10m for rural areas when they are simple junctions with no design vehicle intended (DMRB CD123, 5.6.1) which these junctions are. However, it is clear the radius is much larger here and consequently these wide corners allow vehicles joining the main carriageway to face close to parallel with the main road before joining it which leaves them struggling to correctly see oncoming vehicles for the same side. The same guidance also requires the carriageway width at the tip of the island for the minor road to be 4m at simple priority junctions. The actual width appears to be around 5.8m currently and this implies that the minor roads are also too wide. The solution in this case is likely to redesign and amend the kerb lines to bring them into compliance, narrowing the minor roads and reducing the corner radii so that vehicles are entering the A41 at the correct angle.

7.4. Cluster Site 6 - Newcott Fish & Chips

Collision Analysis

7.4.1 Cluster site 6 has only experienced two collisions in the last five years. Although these did occur because of similar movements of vehicles entering junctions or accesses. One was the result of an nearside turn made worse by tailgating by others whilst the other involved an offside turn and poor judgement of the driver making the turn and are detailed in Table 25 below.

CRASH ID	YEAR	SEVERITY	CASUALTIES	CONDITIONS	CONTRIBUTORY FACTORS	COMMENT
1031480	2021	Serious	2	Dry/Darkness	403,405,602	Bad turn
870213	2019	Serious	1	Dry/Day	308.405	Rear shunt

Table 25 Cluster Site 6 Collision History

7.4.2 Consequently, the collision analysis concluded that there is no evidence of a cluster of collisions here but did recommend the following future steps.

'*Consider signing, speed and options relating to multiple accesses.*'

Road Layout

7.4.3 Cluster 6 is an approx. 110m length of the A41 adjacent to the Newcott Fish and Chips approx. 410m southeast of the Warrant Road junction. Northbound the road rises from a dip in the south. The carriageway alignment is straight and is subject to the national speed limit. There is no street lighting present. A footway is provided on the northbound (western side) of the carriageway but with no dropped kerbs and tactile paving for pedestrians.

7.4.4 On the southbound (eastern) side of the road there is approx. 120m long and 3m wide Type B lay-by. The layby is signed with a parking sign both at the layby and 250 yards in advance. A non-prescribed sign for the fish and chip shop is also mounted on the same post as the advanced parking sign. There are 1010 markings across the front of the lay-by, but no road studs used across the front of the lay-by and the continuous edge line continues along both entry and exit taper. South of the lay-by is a slippery road sign with a ¾ mile supplementary plate.

7.4.5 Within this section there are two accesses for the Fish and Chip Restaurant approx. 25m apart with a further two accesses immediately south of them both approx.20m apart. The accesses are wide and can accommodate two-way traffic. Edge lines are provided with a further set of give way markings in line with the wall at the rear of the footway are provided for the access to the fish and chip restaurant. A narrow central hatch is provided with gaps at each of the accesses to allow turning movements.

Site Assessment

7.4.6 The overall road condition here is good with some exceptions. The edge lines on the southbound direction to the north of the cluster site are partially covered by verge encroachment. Both junctions for the shop set the give way line at the back of the footway and then provide an additional dashed line following the edge line. Although technically correct by the guidance, vehicles stationary at the give way line have their vision greatly impeded by the brick wall on both sides which means they have to crawl forward before committing to a manoeuvre regardless.

Figure 32 Existing Visibility of Exiting Vehicles for Approaching Traffic (Source: Google Maps)

7.4.7 Several central road studs on the northbound approach are damaged or missing. The slippery road sign itself is extremely dirty, barely visible and appears to be angled slightly outwards.

7.4.8 The large number of accesses and junctions here allowing traffic both in and out for the same premises at two locations all with the layby directly opposite creates a very busy environment requiring drivers to pay attention to multiple possible hazards. During quiet times this is not an issue as the hazards all relate to other vehicles, however this stretch of road south of the Ternhill roundabout is the most heavily trafficked and the fish and chip shop is also likely to receive more visitors than almost any other commercial premises on the road over the course of the day.

Recommendations for Cluster Site 6 – Newcott Fish & Chips

7.4.9 Drawing COMHA1T&W038-AMY-GEN-A41-DR-CH-0013 has been provided showing recommended proposals for this cluster site in Appendix D. The missing studs on the main carriageway will require reinstatement. The slippery road sign should be reviewed and given a passive base if is still required and removed if not. The eastern verge requires being cut back to the correct edge of carriageway allowing edge lines to be visible again. The private accesses will require marker posts for each.

7.4.10 The junctions themselves should also have the give way line moved forward to the edge of carriageway and refreshed. Ensuring they have a sufficient visibility splay to join the main road. The junction beside the private access shown in Figure 33 currently has a demarcated footway which is very long and this would be removed as part of that change. Consequently, a raised footway and kerb should be installed between the two to allow for a safe standing area between the two entrances.

7.4.11 The shop junctions could reduce the number of potential hazards along this straight by removing the ability for vehicles to enter and exit at both openings and instead implement a one-way system. This also ensures vehicles attempt to leave by the same junction and not block each other's view.

Figure 33 Existing Private Access and Chip Shop Junction (Source: Google Maps)

7.4.12 Although not to standard, the lay-by here may reduce southbound traffic turning into the shop, especially HGV's and so its closure remains an open suggestion.

7.5. Cluster Site 7 - Blooming Barkers

Collision Analysis

7.5.1 Both events detailed in Table 26 were significant head on collisions where an errant vehicle crossed the double white centre lines. One involved overtaking before the turn and another crossed over due to speed, taking the corner too quickly.

CRASH ID	YEAR	SEVERITY	CASUALTIES	CONDITIONS	CONTRIBUTORY FACTORS	COMMENT
320254	2021	Fatal	3	Dry/Day	409,505	Wrong lane, Head on
1036891	2018	Serious	6	Dry/Day	303,405,602	Wrong lane, Head on

Table 26 Cluster Site 7 Collision History

7.5.2 Since only two collisions have recently occurred this site was identified in the technical note as being no cluster. But as the severity of them is high and the locations existing arrangement is poor the following future steps were put forward:

'Consider signing, speed and options relating to multiple accesses.'

Road Layout

7.5.3 250m north of the bend, there are three private accesses in a left-right-left stagger situated on a slightly curved section. There are merging arrows along the centre and the last access has a pair of marker posts. Edge lines mark out the three accesses here. There is a narrow footway on the west side of the carriageway which ends abruptly whilst a narrow footway begins from the edge of the defunct access. There is no uncontrolled crossing or dropped kerbing here. Finally at the same location there is a bend hazard warning sign with a yellow backplate 170m out.

7.5.4 Further south the centreline becomes solid preventing overtaking for southbound first, then both sides at the beginning of the bend. There is a single chevron sign on the outside of the bend with a yellow backplate and directly opposite, the edge lines on the west side again become hatched demarking a private access which is now defunct. Just after the apex there is a private access for a combined commercial premises and dwelling. This is surrounded by a splayed brick wall just under 1 metre in height. As the bend straightens out there is a priority junction 65m south to the east side which has a steep angle of approach. The footway ends here with the double white lines just a bit further along. Finally, there is a pair of private accesses on the east side which are side by side 140m south.

7.5.5 From the northbound direction the only additional commentary to be made is to note the northbound bend hazard sign with yellow backplate 230m out, which is positioned directly behind a field access demarcated by the edge line and finally there is also a northbound chevron sign for the bend. The speed limit across this area is unrestricted.

Site Assessment

7.5.6 The road surface along this stretch has very few stud eyes missing, and the carriageway is in very good condition. The centrelines, arrows and edge lines are all consistently clear apart from the edge lines on the inner part of the bend. Here it appears significantly worn implying vehicles, perhaps larger ones are taking the corner very tightly to make sure they are leaving space for opposing traffic. This could imply that the carriageway width would benefit from some widening here however there have been no recent collisions recorded as a result of minor lane mis adherence.

7.5.7 The signage here is poor, the southbound bend hazard sign is somewhat dirty and obscured by greenery whilst the northbound hazard sign has a small offset and has clearly been hit with the inside pole at an angle implying it isn't supporting the plate anymore. The yellow backplate has also bent inwards slightly. The field access here is very wide, has no hard standing and is clearly in recent use. There is mud tracked out onto the road here and the edge lines are heavily worn and covered over. The bend chevron signs appear in good order but are obscured by greenery on both sides.

7.5.8 All of the private accesses along here have good visibility except for the commercial premises on the inside of the bend. The brick wall here prevents vehicles from clearly seeing far enough down the road or being seen, especially for nearside traffic which affects every crossing. Only one other access also has any marker posts.

7.5.9 The priority junction at the southern edge of the bend has a very high angle of approach and although it can see somewhat far to the right, there is a blind spot for nearside traffic from the main carriageway where approaching vehicles could be missed. This is even worse for cars attempting to turn right whilst cars attempting to turn left must also look behind them to cover their blind spot.

Recommendations for Cluster Site 7 – Blooming Barkers

7.5.10 Drawing COMHA1T&W038-AMY-GEN-A41-DR-CH-0014 has been provided showing recommended proposals for this cluster site in Appendix D. The vegetation needs cut back significantly for both overgrown signs and the inside corner of the junction to provide a sufficient visibility splay. The northbound hazard sign will require new passively safe posts and possibly benefit from being moved to a greater offset both from the road and field access. Both signs should be checked for siting with Appendix C. A renewal of the edge lines for both the field access and the inside of the bend is also recommended.

7.5.11 The private accesses would all benefit from marker posts and the double white lines should be extended further back on both sides, this is especially relevant for the southern side as it currently allows overtaking right up to the junction.

7.5.12 For consideration, a junction mirror would allow the nearside carriageway blind spot to be covered fully as well as seen from an appropriate angle, whilst the access on the inside of the bend can only achieve an appropriate visibility splay from a mirror on the outside of the bend. It is important to note that the use of mirrors is not supported by DfT nor many authorities, but Shropshire do have a formal application process for them, and the access has no other realistic means of achieving visibility. Additionally, some hard standing for the field access could reduce tracked mud onto the carriageway which appears to occur historically on google street view and was witnessed on the site visit also.

7.6. Cluster Site 8 - Hatton Road Junction

Collision Analysis

7.6.1 Both bad turns here were from vehicles exiting the minor road and missing the give way line or pulling out with poor timing. The rear shunt involved an oncoming vehicle turn into the junction sharply across the carriageway. All three share the same factor of poor judgement and are given in Table 27. A relatively wide minor road entrance may indicate that drivers leaving the main road try to take the corner too quickly whilst those joining are turning too far left to properly see the main carriageway behind them.

CRASH ID	YEAR	SEVERITY	CASUALTIES	CONDITIONS	CONTRIBUTORY FACTORS	COMMENT
1163232	2022	Slight	2	Dry/Day	306,401,503,605	Bad turn
908844	2019	Slight	1	Wet/Darkness	405	Bad turn
1234357	2022	Serious	1	Dry/Day	101,308,408	Rear shunt

Table 27 Cluster Site 8 Collision History

7.6.2 It had been concluded that high driver confidence is a factor with all three collisions being exacerbated by poor judgement. The recommended future steps were as follows:

'Consistent signing, judgement and confidence measures, bus stop considerations.'

Road Layout

7.6.3 This junction is located just north of the end of a WS2+1 section with unrestricted speed limit. Starting from the northbound direction with this arrangement there is a pair of road narrows hazard signs with 'end of crawler lane 100 yards' notation. There are double white lines here and the lanes begin merging immediately at these signs. These are then followed up by a similar pair of signs again just with 'end of crawler lane' notation. The centreline begins tapering out to a ghost island at this point on a slight bend and uphill incline.

7.6.4 There is then a pair of staggered junction hazard signs with safety camera plate and '150 yards' notation with no back plate which are followed by a single staggered junction hazard sign with yellow backplate and freight sign. Just before the minor road there is a single nearside slippery road hazard sign with 'for ½ mile' notation plate. Directly behind this on the same verge is a barrier setback quite far following the taper of the junction itself. Directly opposite the junction entrance is a dedicated right turn lane in the centre followed by a private access on the opposite verge.

7.6.5 Just north of the junction the dedicated right turn lane for southbound switches over to an equivalent for northbound for an offside private access. The full width centre lane here is only about 12m in length with a very sharp taper of the double white lines. The ghost island goes back to hatching and begins tapering out after this turn. A satellite image of the staggered right turn lanes is provided below.

Figure 34 Existing Centre Arrangement North of Hatton Road Junction (Source: Google Maps)

7.6.6 When looking at the junction from the southbound direction, the double white lines are in place early with the ghost island taper also heading on an uphill gradient. On the nearside there is a Hinstock sign followed by a staggered junction hazard sign with a yellow back plate before the junction and private accesses. Just directly after the junction there is a large nearside ADS followed by a lay-by for a bus stop. For vertical alignment, the junction is roughly where the peak of the hill occurs, and this limits visibility ahead somewhat.

Site Assessment

7.6.7 Overall conditions are excellent and problems with the junction are almost certainly arrangement. The condition of the road and road markings is very good. All the signs are correctly offset, clean and visible and stud eyes are consistent. The give way lines for the junction itself are slightly worn and the private accesses have a good setback, clear visibility, and multiple marker posts with clear edge lines.

7.6.8 From both directions the road has fast sweeping bends on an uphill gradient with the crest around the junction and access entrances, this leaves forward visibility limited to below what it would otherwise be. Due to the road narrowing just before, the northbound direction only has signs for the junction sited at 150 yards which is likely to low for the first hazard sign and there should be a single variant installed on the northbound nearside. The crawler lane notation signing on the dual carriageway is also not present within TSRGD.

Recommendations for Cluster Site 8 – Hatton Road Junction

7.6.9 Drawing COMHA1T&W038-AMY-GEN-A41-DR-CH-0015 has been provided showing recommended proposals for this cluster site in Appendix D. Firstly, all four notation signs to the south on the dual carriageway with end of crawler lane could be removed as part of the regular maintenance schedule.

7.6.10 A clear issue with the arrangement is the provision for the right turn into the private access. Guidance suggests a minimum right turn lane length of 80m with a taper of 25m (DMRB CD123, 5.22.1) but here there is only 12m of lane and the taper is maybe 3m. This has been done to give the southbound right turn lane as much length as possible (which itself is only 55m) which will carry much more traffic, but the access lane is so short that it is unlikely most vehicles have space to align themselves in the lane properly. This is even more important here as the centre has begun tapering and the width of the centre lane is only 2.7m.

7.6.11 In conjunction with the summit and bend reducing forward visibility for this fast section, the fact the access is linked to numerous dwellings and the fact that all other nearby junctions and accesses lack provision for a direct right turn for northbound traffic. In consultation with the residents, the right turn lane could be considered for removal and the southbound right turn extended to bring it closer to the 80m requirement. No recent collisions have been recorded. However, the nature of the arrangement is quite likely to result in any collision occurring to be of a more serious nature. A rear shunt of a misaligned vehicle here would push it into the direct path of oncoming traffic and head-on collisions are often where the most severe collisions occur.

7.6.12 Additionally, the arrangement has no provision for the prohibition of any vehicle type, thus allowing long or wide vehicles to attempt the turn. If the right turn is kept, then long or wide vehicles should be banned from the right turn and appropriate signing provided.

7.6.13 Finally, the private access directly opposite the junction in Figure 34 is in a poor location between the bus stop and opposite junction and could be closed off. This would require reopening of the old road layout for the dwelling to then gain access via Chester Road. Alignment and constraints would need to be checked for this to be possible first and is only a suggestion due to the clear costs involved.

7.6.14 The priority junction having a large entrance corner radius supports the high-speed turns, but the exit corner is the same. Cars which position themselves forward will inhibit their nearside view. It is difficult to confirm whether a treatment is beneficial here and no direct recommendation has been made, however if more collisions occur because of poor judgement pulling out then this would be a clear indicator to narrow the exit.

7.7. Cluster Site 9 - 600m North of Standford Service Station

Collision Analysis

7.7.1 Only one collision occurred here involving a motorcyclist who became target fixated on a bend and ran wide with no other vehicles involved. It was concluded that there were not enough recent collisions for any trend to be found. As it had been identified as a site initially, it would have experienced multiple collisions before 2018 and had not received any notable upgrades. The future steps provided suggested the following:

'Consider removing inside bend vegetation, review extents of double white lines and consider extending them.'

Road Layout

7.7.2 From the south, there is an east side type A layby (DMRB CD169, 4.1) 190m out on a slight left bend. Followed by an offside bend hazard warning size with yellow backplate, max speed repeater and distance notation sited at 150 yards. The carriageway itself is quite narrow, around 3m in width with no edge line but a recently dug out kerb and the centre line prevents overtaking for northbound traffic. The drains are consistently spaced on both sides along this section which has a speed limit of 40mph. At the bend itself there is a short stretch of double centre lines for only 10m or so and there are 3 single chevron signs on the outside of the bend with a long line of thin marker posts further outside.

7.7.3 The southbound direction has an equivalent bend hazard sign sited at 100 yards, chevron signs and similar carriageway arrangement otherwise. Although only a slight chicane there is enough greenery on the verge to obscure vision of approaching traffic from either direction.

Site Assessment

7.7.4 The road surface, stud and marking quality are very good here. It is unclear why the southbound bend hazard sign is sited at 100 yards instead of 150 as there is clearly space for it along the verge and by the time it is visible to read the 100 yard sign the chevron signs are already clearly visible. The chevron signs themselves have been installed the wrong way round and need to be corrected as this encourages understeer for the corner and consist of a single chevron with a thin yellow outline, both of which are against guidance (TSM Ch.4, 3.4.3).

Recommendations for Cluster Site 9 – 600m North of Standford Service Station

7.7.5 Drawing COMHA1T&W038-AMY-GEN-A41-DR-CH-0016 has been provided showing recommended proposals for this cluster site in Appendix D. The chevron signs need turned but ideally be replaced with doubles with the correct yellow outline size. A choice between two treatments is available here. If the verge vegetation was cut down to allow full visibility, then overtaking could be allowed between junctions to the north and south which would double the allowable overtaking distance within the area. Otherwise, the current length of the double white line in the centre only covers a 10m stretch of the road, this should be extended to discourage such manoeuvres.

7.7.6 As there are no private accesses in the area and they have recently been removed during the recent maintenance, edge lines have not been directly recommended here. It is suggested that they are added

alongside the next centre line refresh due to the bend still being a hazard and there being nothing retroreflective except the chevrons.

7.8. Cluster Site 10 – Forton Roundabout (A519/B5062)

Collision Analysis

7.8.1 Again, only one collision occurred here involving a speeding car on approach to the roundabout with no other vehicle involved. It was concluded that there were not enough recent collisions for any trend to be found. As it had been identified as a site initially, it would have experienced multiple collisions before 2018 and had also not received any notable upgrades. The future steps provided suggested the following:

'Consider options relating to driver confidence, update markings and studs.'

Road Layout

7.8.2 Starting northbound the carriageway here is quite wide with edge lines and what looks like a 0.5m hard strip. There is a large nearside ADS for the roundabout with an offside roundabout warning sign followed by an nearside directional sign for freight. At the roundabout approach the centreline splays out into hatching followed by a raised traffic island fronted by a keep left bollard. The island has surrounding hatching to keep the road to a single lane but the roundabout has space for two vehicles with no lane lines. There are chevron signs with yellow backing plates and directional arrows situated around the roundabout. The exit has a directional sign on the island which also has a footway running through it and uncontrolled crossing with dropped kerb.

7.8.3 From the southbound direction the carriageway has an identical arrangement with the addition of kerbing installed here with another large ADS for the roundabout. This time it is followed by a directional sign for parking and a locality. Just before the island is the same directional sign for freight followed by an identical island layout. Past the exit there is a mileage sign with speed camera warning. This area has street lighting and clearly lots of drainage throughout, the speed limit is unrestricted.

Site Assessment

7.8.4 The quality of road markings for edge lines, centre lines and hatching here is quite variable, with some being worn away entirely in places whilst being clearly visible elsewhere. The northbound large ADS has the bottom panel slipping and the offside warning sign is partially obscured by the nearby tree leaving it in darkness. The bollard is quite dirty, the pedestrian crossings all lack tactile paving, and the northbound directional exit sign is slipping on one pole leaving it askew. Each entrance to the roundabout has a chevron sign apart from the A519 entrance where it has clearly been hit and there is only a single standing pole remaining whilst the other is still bent into the ground.

7.8.5 The southbound direction has no equivalent hazard warning sign for the roundabout, although the bollard is acceptably visible, it appears to be of a different size class. Road marking quality is generally better on approach here than the roundabout and southern side and road surface quality is good.

Recommendations for Cluster Site 10 – Forton Roundabout (A519/B5062)

7.8.6 Drawing COMHA1T&W038-AMY-GEN-A41-DR-CH-0017 has been provided showing recommended proposals for this cluster site in Appendix D. The roundabout hazard warning sign and its adjacent mileage sign shown in Figure 35 are situated between two large trees which even when cutback will still be overshadowed. It would be possible to extend the power from a nearby roundabout lamp post and install a lighting unit for the signs however, an alternative would be to move them forward to avoid the consistent maintenance from the vegetation entirely.

Figure 35 Mileage and Hazard Signs Under Cover (Source: Google Maps)

7.8.7 A replacement for the missing chevron sign on the roundabout should be installed and tactile paving for the pedestrian crossings provided. The bollards will need one replaced to match the other, and cleaning. The road markings in general should be refreshed where they are heavily worn, especially for the island hatchings on approach and the signs that are askew or slipping should be reattached.

7.9. Cluster Site 12 - B4379 Junction

Collision Analysis

7.9.1 Table 28 shows the seven recent collisions that have occurred at this site. Those involving the bad turn and head on were found to have no consistent trend and are thought to be isolated events. The remaining incidents all occurred in a similar manner with consistently wet conditions. The pandemic also caused a large reduction in traffic which would have reduced the likelihood of such incidents occurring post 2020 and the surface was re-laid around 2022/2023. This may explain why the rear shunts have not continued to occur more recently.

7.9.2 It was also identified on google street view and the site visit that the nearby quarry clearly tracks dirt and mud onto the road, which combined with the negative gradient of the main carriageway may contribute to the rear shunts. The angle of approach for the side road also causes exiting northbound traffic to have to slow to a standstill to make the turn which is not clear on approach and may result in drivers making a misjudgement.

CRASH ID	YEAR	SEVERITY	CASUALTIES	CONDITIONS	CONTRIBUTORY FACTORS	COMMENT
352124	2018	Slight	1	Wet/Day	405,406	Rear shunt
971237	2020	Slight	1	Dry/Day	406	Rear shunt
888504	2019	Slight	3	Wet/Day	103,308,408,708	Rear shunt
891328	2019	Slight	1	Wet/Day	405,602,703	Rear shunt
342753	2018	Slight	2	Wet/Day	405	Rear shunt
1230027	2022	Fatal	1	Dry/Day	306,403,405	Wrong lane, Head on
1162763	2022	Slight	2	Dry/Day	403,405	Bad turn

Table 28 Cluster Site 12 Collision History

7.9.3 The collision analysis concluded that the rear shunts consistently occurring were likely due to poor drainage and possibly also the road surface on approach to the junction being less effective in wet conditions due to dirt and mud being tracked out by the nearby quarry at the top of the hill. The recommendations for future steps were as follows:

'*Fix southbound signs, add equivalent northbound signs. Add further drainage capacity. Investigate debris and muck on road to identify appropriate mitigation and enforcement.*'

Road Layout

7.9.4 Starting from the south the carriageway here is 3m wide, only has kerbing and follows a series of short bends with double white lines. There is a junction hazard warning sign with yellow backplate and ‘reduce speed now’ notation for the nearside only sited 380m south. A large nearside ADS 300m out from the junction denotes a weight limit for the side road before the double white’s end.

7.9.5 At the junction itself there is a notable climb to the top of the hill where there is another nearside junction to an industrial premises 115m to the north. Directly opposite the junction is a pair of directional signs for the side road.

7.9.6 From the north there is a footway on the western edge and a speed camera sign. Another large ADS at 250m to the junction is present further down the road followed by another nearside junction hazard warning sign. There is another direction sign opposite the junction for the industrial premises followed by a slippery road warning sign just after.

7.9.7 This section of the road has an unrestricted speed limit, and it notably has no drains on the southern side of Buttermilk Hill. With none for almost 700m.

Site Assessment

7.9.8 Road markings here are in good condition where the road surface has recently been re-laid although there is a failing drain cover that may not be rated for this highway shown in Figure 36.

Figure 36 B4379 Junction Failing Chamber Top (Source: Google Maps)

7.9.9 As there are no edge lines there is kerbing present which is mostly visible but is starting to see build-up of debris and overgrowth. The direction signs opposite the B4379 junction have been hit and are dirty. One is at a 45-degree angle also implying it is not passively safe whilst the other is flat on the ground. The weight limit sign opposite the industrial premises is entirely overgrown and unreadable.

7.9.10 The large ADS for the southbound direction is very dirty and not passively safe whilst the northbound equivalent is damaged and its lower panel has slipped. The junction hazard sign for northbound is also beginning to become overgrown although still well visible for now but is also likely not passively safe.

Recommendations for Cluster Site 12 – B4379 Junction

7.9.11 Drawing COMHA1T&W038-AMY-GEN-A41-DR-CH-0018 has been provided showing recommended proposals for this cluster site in Appendix D. Replacements for both direction signs, the large ADS for both sides and junction hazard sign are all required. As well as the clearing of vegetation for the nearby junction sign and junction hazard sign to the south. The kerbing could be dug out in some areas especially the south and the verge vegetation is well grown and worse in the south. The installation of some drainage along this stretch is also suggested as an initial treatment to tackle the consistent collisions occurring in wet conditions. After the drainage is upgraded it may be beneficial to carry out a new SCRIM test for the area to assess whether the actual skid resistance of the section has improved.

7.9.12 If the skid resistance does not meet what the level required, or future collisions continue to occur in a similar manner, then this points to the tracked dirt being a factor. It is suggested to apply enforcement of conditions for use of the highway with the industrial premises. As there is already an appropriate slippery road warning sign which is already in place here, it is recommended to pursue solutions at this location until the sign can be removed.

7.9.13 Finally, the failing chamber top should be checked it meets the standard for this highway and should be repaired and replaced.

7.10. Cluster Site 13 - King Street Junction

Collision Analysis

7.10.1 King Street junction is the southernmost crossroads and cluster site on the route located in Weston Heath which has an asymmetric layout. Table 29 shows two rear shunts occurred in the same manner in dry conditions and a bad turn.

CRASH ID	YEAR	SEVERITY	CASUALTIES	CONDITIONS	CONTRIBUTORY FACTORS	COMMENT
1168902	2022	Serious	1	Dry/Day	307,405,602	Rear shunt
851530	2019	Serious	1	Dry/Day	406	Rear shunt
352143	2018	Slight	1	Wet/Day	103,403,405,406	Bad turn

Table 29 Cluster Site 13 Collision History

7.10.2 The collision analysis for this site was only able to conclude that both rear shunts were similar, but not much else could be found. The bad turn in 2018 appears to be a classic example of crossing into oncoming traffic, but it has only happened once. Several considerations and treatments were found as part of the site analysis, and the following future steps were recommended:

'Consider road surface, reinstall markings and studs. Install southbound signs, move northbound signs, replace kerbing. Cut back vegetation.'

Road Layout

7.10.3 Beginning northbound this section is very straight, with kerbing, no edge lines, and a verge. There is a nearside slippery road hazard sign with ½ mile notation 270m out, followed by a large ADS for the junction and finally another directional sign right after 105m out. Approaching the junction there is an infilled layby which still has a dropped kerb at the entrance.

7.10.4 There is forward signage for the junction nearside for the right turn and on the far offside for the left turn. The side road splays are very different with the corners for Plough Bank being very wide and having a slight diverge to partly help with the steep angle of approach it moves in from. The King Street entrance is very narrow and has an appropriate unsuitable for HGV's sign at the entrance.

7.10.5 When travelling southbound there is a private access to the west followed by a large ADS for the junction which again has an addition directional sign directly after it. Just opposite the second sign is another private access on the same side which shared a short footway to another private access just further along. On the rear of that final dwelling there is a field access again with a dropped kerb and a nearside 1-mile Parking sign.

There is signage for the right turn of the junction at the nearside but nothing for the overrunning left turn of Plough Bank.

7.10.6 There is consistent drainage along this section and the site is constrained on two opposite corners by a dwelling beside King Street and a communication mast beside Plough Bank. A third corner is constrained by a communication pole.

Site Assessment

7.10.7 The road surface here is moderately poor with a fair amount of patching, directly along the junction itself there is a rut developing along the centre line which is well worn. The give way lines on both sides are also well worn. The signing for southbound is very poor, both large signs have a small offset and have clearly been hit. The large ADS is not passively safe, missing two panels and the third has slipped whilst the second direction sign has no panels left at all and is likely too close causing it to be obscured. This combination offers no information for the right turn at all. The parking sign is also quite dirty. The northbound signage appears to have a similar offset but is in good condition and untouched.

7.10.8 The signing at the junction itself is all in good condition, however there is nothing for the left turn for southbound traffic. Although it is constrained and a small road, the radius of the corners for King Street may be too small, especially the northern side which has some consistent overrun. The kerbing on this side is quite good but the Plough bank side is in a poor condition.

7.10.9 There is overgrowth along the main carriageway on both sides of the side road and the Plough Bank left turn has lots of consistent overrun as well as no kerbing left showing which is covered in debris and likely pushed down also. Junction visibility for both sides is very good although the Plough Bank exit may have obscuration by a main carriageway sign when looking right. Finally, the far side signage for traffic exiting King Street is installed at an angle that makes it easily readable to northbound traffic and may not be compliant.

Recommendations for Cluster Site 13 – King Street Junction

7.10.10 Drawing COMHA1T&W038-AMY-GEN-A41-DR-CH-0019 has been provided showing recommended proposals for this cluster site in Appendix D. It is recommended that a junction safety scheme be developed here to allow for localised widening of King Street and the renewal of carriageway surfacing. This will then allow for fresh road markings to be laid as required. A treatment for replacement kerbing would also likely benefit from a similar approach doing everything at once here.

7.10.11 Replacement and repair of the northern signing is required including ensuring all posts are passively safe moving forward as well as repositioning of the second large direction sign to the north. Cleaning of the parking sign could be carried out at the same time. In addition, the slippery road hazard sign should be confirmed to still be required or be removed.

7.10.12 Although kerbing is present, the lack of edge lines and marker posts leaves the numerous private accesses appearing discreet, especially with large trees around them giving the entrances shadow. The visibility splay of each of these does appear to be mostly within the relaxed standard but edge lines and marker posts are recommended for each, even if not continued along the rest of the carriageway.

7.10.13 Finally, the signage at the northeastern corner of the junction should have changes be considered to make the main carriageway sign less of an obstruction; this could mean just removing the added private sign or raising the height of the entire plate or moving it further back as well as possibly adjusting the angle of the far side road direction sign which could be less visible from the main carriageway. Moving it back has been the option provided on the drawing.

7.11. Cluster Site Treatments Summary

7.11.1 The recommended cluster site treatment proposals have been summarised and categorised in Table 30 below.

CLUSTER SITE	TREATMENT
2 - Green Lane	- Marker posts for accesses - Vegetation cutback for minor road visibility - Double white lines along crossroad and accesses
4 - Tern Hill Roundabout	- Repair and replacement of road studs, tactile paving and footway - Corrections for chevron backplate - Alternative pedestrian crossings - Considerations for signalised crossroads or expanded roundabout
5 - Warrant Road	- Refresh markings and central hatching realignment - Repairs and replacements of signing and bollards - Vegetation clearing and verge cut back - Marker posts for accesses to the south - Considerations for future schemes to narrow side road exit and reposition traffic islands
6 - Newcott Fish & Chips	- Surface/stud repairs as well as verge clearing and cut back - Marker posts for accesses - Forward positioning of give way lines - Raised footway and kerbing - Considerations for one way shop entrance/exit and lay-by closure
7 - Blooming Barkers	- Sign repairs and positioning - Junction corner clearing for visibility - Marker posts for accesses - Expansion of double white lines - Consideration for field hard standing
8 - Hatton Road Junction	- Marker posts for accesses - Removal of non-standard signing - Considerations for right turn lane removal and private access closure
9 - 600m North of Standford Service Station	- Corrections to chevron signing - Proposals to either expand double white lines or fully cut down verge vegetation to allow overtaking - Consideration for eventual reinstatement of edge lines
10 - Forton (A41/A519/B5062) Roundabout	- Correction and cleaning of bollards - Replacement chevron sign - Refresh of markings and hatching boundary - Consideration to either cut back trees, install lighting unit or move map sign
12 - B4379 Junction	- Installation of drains around junction - Replacement of broken and non-passive signing and chamber top - Vegetation clearing - Considerations for carriageway skid resistance
13 - King Street Junction	- Replacement and repair of northern signing - Repositioning of corner direction sign - Overrun verge reconstruction or realignment - Marker posts for accesses - Considerations of future scheme for widening of Kings St entrance, carriageway resurfacing and markings refresh

Table 30 Cluster Site Recommendations Summary

8. Additional Locations

8.1. Newport Bypass Services Exit

8.1.1 During the initial project start meeting. TWC requested as part of the options report that concept level solutions for a specific site located at the services exit at the southern end of Newport Bypass be provided. Drawings COMHA1T&W038-AMY-GEN-A41-DR-CH-0006 and COMHA1T&W038-AMY-GEN-A41-DR-CH-0009 have also been provided showing a sketch of the proposed design options under Appendix D.

Road Layout and Context

8.1.2 The exit to the services forms a priority junction shown in Figure 37 and has an uncontrolled pedestrian crossing across it. Some deflection is provided for the entry on to the A41 to encourage left turn movements. The right turn onto the A41 is prohibited and is marked by a pair of no right turn signs. However, the exit is still experiencing many errant vehicles carrying out a right turn moving across the auxiliary lane to join the southbound traffic when they should be joining the nearside carriageway to travel north and then circle around the roundabout instead.

Figure 37 Newport Bypass Services Exit (Source: Google Maps)

8.1.3 After a previous attempt at a solution using a line of bolt down kerbing with slim bollards appears to have failed, shown in Figure 38.

Figure 38 Kerbing with Bollards Previously Installed in 2022, Now Removed (Source: Google Maps)

8.1.4 The existing temporary arrangement seen in Figure 39 has been to put a line of traffic cones in place along the edge of the carriageway and auxiliary lane to block vehicles making such a manoeuvre in the short term. A permanent solution has been requested.

Figure 39 Existing Arrangement Using Cones (Source: Google Maps)

8.1.5 The exit is constrained by the existing A41 carriageway, the fuel service station on the corner and must account for the uncontrolled pedestrian crossing which cannot be removed. It is also known that this location is privately owned and therefore any changes proposed outside the highway extents must involve engagement with the landowner.

8.1.6 Although the main carriageway is not constrained and could be extended on the opposite side if needed, this would likely involve additional land acquisition, significant design considerations for the alignment of the nearby roundabout approach and significant works that would go outside the scope of the problem. There also appears to be some form of retaining wall structure or foundation along the outer edge of the footway at the crossing closer to the roundabout.

8.1.7 Consequently, it is preferable that a solution be found that does not involve moving the existing carriageway of the main road at all. A handful of treatments were then conceptualised and categorised into two overall options, a low-cost compromise, and a full solution.

Option 1

8.1.8 A compromise that would block off the turn from the main carriageway more effectively to remove the need for the cones was considered first. This would involve creating a larger deflection for the exit lane which would deny joining traffic the right turn. This could be done within the existing constraints of the site by extending the central island out to the edge of the existing hatching both along the main carriageway and the minor road shown in Figure 40.

Figure 40 Existing Island Hatching (Source: Google Maps)

8.1.9 This would likely be an aid in forcing joining traffic to adhere to turning left by forcing some deflection and reducing the angle of approach of the junction.

8.1.10 An additional requirement of this solution is that long vehicles would have to be banned from the exit as it would no longer be suitable for them, and appropriate signage would need to be added to the exit at the mini roundabout such as that used in TSM chapter 3 diagram 629.1 prohibiting long vehicles. Long vehicles could still join the A41 but would have to travel through to Audley Avenue and then the A518 first, consequently this would not be a restrictive change.

8.1.11 A more significant variant of this solution was considered involving extending the island slightly further and then making use of the verge to introduce a nearside merge taper. This would also require moving the tactile

paving of the pedestrian crossing further back as well. Although there may be space along the verge for a merging taper, guidance stipulates that *'Merging tapers shall only be used where the major road is a dual carriageway'* (DMRB CD123, 5.23). Consequently, this treatment was not taken further as the additional works involved to create this arrangement are significant and would only make a minor difference to denying an errant vehicles path.

Option 2

8.1.12 The second solution is to replace the cones with an appropriate barrier to deny the right turn entirely. This still involves requiring the extension of the minor road traffic island to introduce some needed deflection for the exit, and for a thorough treatment this could be extended into the minor road shown in Figure 41 as guidance only requires a minimum of 4m width for the minor road (DMRB CD123, 5.7).

Figure 41 Proposed Extended Traffic Island Edge (Source: Google Maps)

8.1.13 The main carriageway to the north tapers out from the centre to a spitter island which gives way to the right turn lane shown in Figure 42. This spitter island could have a kerb line extended along the edge of the right turn lane all the way down across the minor road exit forming a narrow central island. The existing width of the centre lane is currently around 4m which allows for some space to be taken up by a narrow centre kerb line as it can be reduced to 2.5m as a minimum (DMRB CD123, 6.10).

Figure 42 Existing Northern Spitter Island Hatching Arrangement (Source: Google Maps)

8.1.14 The raised kerb continues past the spitter island which would need to be extended in width to the edge of carriageway on both sides and forward along the entire hatched area before then tapering and continuing along the centreline. Guidance is provided on such an arrangement in Figure 43 as below.

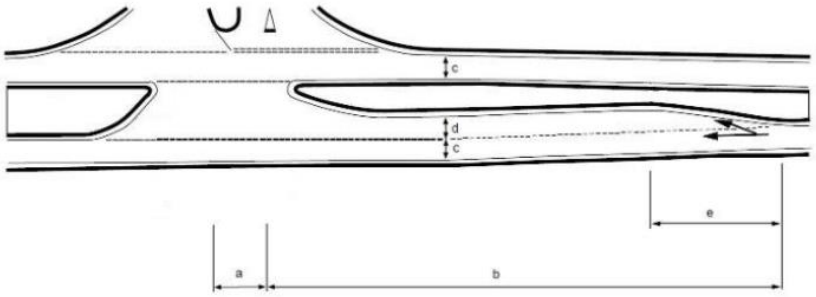


Figure 43 Minor Road Junction with SLD (Single Lane Dualling) (DMRB CD123, 6.3d)

8.1.15 The existing arrangement allows for space to meet every requirement except for one, which is the width of the central reserve. Guidance requires the following:

'The width of the central reserve island (including hard strips) adjacent to the minor road shall be a minimum of 8 metres at existing junctions where the right turn out of the minor road is prevented.' (DMRB CD123, 6.16)

8.1.16 This cannot be met without significant realignment and expansion of the main carriageway which then runs into constraints with the nearby retaining wall opposite, considerations for the roundabout exit/approach and so on. It is suggested that this is accepted as a necessary departure from standards which is supported by the 40mph speed limit, sufficient lane widths and lighting. Finally, the same guidance defines the length of central reserve opening[2] to be limited on both sites and this would likely require the existing southern spitter island to be extended along the main carriageway by a few metres.

8.1.17 Consequently, a kerbed central island 1.5m in width running along the right turn lane could fit in whilst maintaining 2.5m of width for the lane itself. This would run up to the centre of the minor road traffic island completely blocking off any right turn from the minor road as well as provide sufficient standing for similar bollards as those used before to act as an additional deterrent.

8.1.18 Finally, an initial third option was considered involving the installation and use of an enforcement camera to monitor the junction exit itself. This option would have the smallest upfront cost of the treatments considered but would also introduce a continuous enforcement burden. As TWC does not currently have the powers for such enforcement this option has not been brought further forward.

8.2. Chester Road Junction

8.2.1 Amey was asked by Shropshire Council to provide advice on a junction which is not part of a cluster site but has received attention from residents calling for safety improvements to be made. The Chester Road junction shown in Figure 45 joins the A41 along the Hinstock Bypass which has a WS2+1 lane arrangement with two lanes for northbound traffic. Here, there is an east side priority junction with a raised traffic island in the centre. The junction entrance is of a major/minor priority junction with nearside auxiliary lane arrangement[3] as shown below, and the main carriageway has a gradient falling southwards which is also on a slight bend.

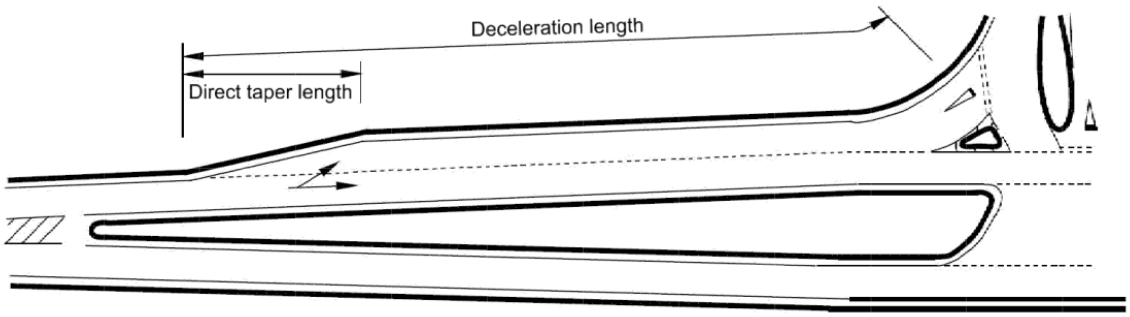


Figure 44 Major/Minor Priority Junction with Nearside Auxiliary Lane (DMRB CD123, 5.22)

[2] DMRB CD123, 6.16
[3] DMRB CD123, 5.22

8.2.2 An errant vehicle entered the back garden of the corner dwelling shown below by the gap in the tree line and the junction has since reportedly been plagued by many near misses or minor collisions causing consternation about the safety of the junction with residents.

Figure 45 Chester Road Junction Existing Arrangement (Source: Google Maps)

8.2.3 The original planning application had some form of vehicle restraint system (VRS) wrapping around this corner. It is unclear what type of VRS this was. Whilst it may provide protection for vehicles travelling on Chester Road, it would not provide protection from those heading of the A41 which would hit it straight on.

8.2.4 A high-level consideration for the existing arrangement brought forward the following issues shown in Table 31.

CRITERIA	EXISTING ARRANGEMENT (M)	REQUIRED ARRANGEMENT (M)
Length of taper	65	25
Deceleration length	112	80

Table 31 Auxiliary Diverge Lane

8.2.5 In addition, the following was identified:

- The traffic island has hatching on the inside turn allowing for errant vehicles to bypass the kerb which doesn't wrap around the corner fully.
- The bollards regulatory sign arrows are missing and too small for forward visibility.
- The taper is 65m whilst the full length of the auxiliary lane is only 47m, traffic may not be slowing down much until it is fully inside the diverge and the fully realised lane is 8m shorter than guidance requires.

8.2.6 Suggestions to improve the arrangement are as follows:

- Sharpen the diverge taper to a shorter length of 25m to realise the full width of the auxiliary lane earlier.
- Expand the tail of the traffic island further along the hatched area so that an errant vehicle must mount the kerb rather than veer past it.
- Apply red studs along the outer edge of the hatched area on the inside of the corner to demarcate its boundary with the island at night.
- Ensure the bollards have directional arrows and good retro reflectivity, also consider replacing with a larger size.
- Apply a ‘slow’ road marking on the auxiliary lane.
- Resurface the diverge with a 68+PSV surface course.

8.3. Rosehill Bridge Parapets

8.3.1 During the site visit the structure over the culvert at Rosehill was identified as having a damaged and low parapet. The site is situated between cluster sites six and seven along a straight stretch of road shown in Figure 46. The carriageway here has edge lines, centre lines in a warning arrangement and a footway adjoining the western side with an unrestricted speed limit. To the north there are two bodies of water, Colehurst Lake and Rosehill Carp Lake which then travel underneath the A41 to continue to join a nearby stream which then feeds into the River Tern. This site is consequently a flood risk location identified in the flooding section as Rosehill 006.

Figure 46 Rosehill Bridge Existing Arrangement (Source: Google Maps)

8.3.2 From the northern side there is a pair of road narrowing hazard signs with yellow backplate sited at 290m followed by a single offside junction hazard warning sign with ‘reduce speed now’ notation and an additional location sign with yellow backplate underneath for Rosehill. 80m north of the structure there is then an ADS followed by another directional sign, both nearside, a private access to the offside with a gate and then the carriageway dips down directly before the bridge on this side.

8.3.3 Starting 290m south there are equivalent road narrows hazard signs again followed by a couple of directional signs. These are south of a handful of private accesses and a junction around 115m to the south. The road here has an apex further back and maintains a shallower negative gradient for longer giving better visibility on approach to the structure. The footway simply ends at the parapet on either side and only the western parapet is clearly visible in daytime as the eastern side is surrounded by vegetation.

8.3.4 The bridge wingwalls are splayed and the parapet walls follow their alignment. These then project at an angle into the footway and verge. The parapets are of a brick construction approximately 0.45m to 0.6m above the footway/verge. These are continued on by a wooden fence or hedge line from each corner along the highway boundary.

8.3.5 Upon further investigation of the site the following issues were agreed:

- The offset of the parapets from the edge of carriageway is extremely low, approximately 0.3-0.35m. Which is less than that of many signs which have seen impact damage along the route and the parapet itself also has clearly been hit, making it an active hazard.
- The western parapet obstructs the full width of the western footway which runs to it from both directions. As there are no alternative crossings pedestrians must enter the carriageway to cross here which is clearly against guidance.
- The eastern side is almost entirely obscured by vegetation which hides the brick parapet.
- The brick parapet arrangement is not an appropriate form of VRS to current standards.
- There is a significant drop to the stream as this culvert is quite large and the surrounds are all insufficient forms of VRS to stop an errant vehicle. The low height wall constitutes a trip and overtopping hazard to pedestrians.
- The road narrows hazard signs are correctly sited, however as both sides are busy and have numerous signs and to the south also lots of side roads, drivers do not necessarily maintain the road narrowing hazard as an approaching hazard to look out for by the time they reach the bridge.
- The hazard itself has no markings, markers or retroreflective signing, the edge lines do not vary and there is no street lighting making it extremely difficult to see in the dark.
- Overtaking is not prohibited here, and the road is straight, potentially resulting in vehicles attempting to overtake through this part.
- This is located at a low point for the road which bottoms out over the bridge and is in a level three flood zone. During a flood event this dip of the road will experience flooding across a longer stretch than any other flood zone identified. There are alternative side routes through lanes both north and south, but these involve single track roads which would not be suitable for larger vehicles.

8.3.6 Although not entirely within the scope of guidance as this is likely spanning a culvert rather than specifically an arch bridge, guidance does state *'Masonry parapets should not be used to restrain errant vehicles.'* (DMRB CD376, 4.26.1)

8.3.7 Additionally, the number of overlapping hazard and direction signs which drivers see on either approach could be detrimental:

'Research has shown that the greater the number of signs which drivers are presented with simultaneously, the greater the difficulty they are likely to have in assimilating the information.' (TSM Ch.3, 1.10.1)

8.3.8 An example of this is that northbound traffic currently passes the road narrowing hazard sign and then there is a total of 9 additional signs (many of which are commercial rather than highways) between the notifying hazard sign and the hazard itself. It is recommended that a check be done on this area to confirm if such signage requires approval and has been subsequently approved.

8.3.9 Consequently, the current arrangement at this structure with this parapet arrangement is not to current standards. Unfortunately, due to the nature of the existing structure, potential rectification treatments are unlikely to be viable without significant structural modification works, which could involve extending or the partial or entire replacement of the existing structure. Such options are considered outside the scope of this report and so a focus has been given to providing stopgap mitigating treatments instead. It should also be noted that this location was not identified as a cluster site, meaning that at least in the last several years it has not experienced a significant number of recorded collisions and certainly no fatalities. However, the potential seriousness of a collision that the parapets walls may cause should not be underestimated within this site's risk profile.

8.3.10 Currently, the road does provide road narrowing hazard signs with a yellow backing place in both directions. However immediately after these signs other hazards, directional information or signing is displayed which may cloud their judgement on where the road narrowing occurs. The numerous accesses and side roads also mean that whilst the hazard signs may be sited for an unrestricted speed limit, many vehicles will likely slow whilst approaching these hazards, causing the length of time between passing the hazard warning sign, and reaching the parapets to be longer than the siting distance designs for.

8.3.11 Consequently, it is suggested that distance markers be added to the existing hazard signs to aid drivers in understanding roughly how far ahead the hazard is. The same can be done for the junction hazard signs which then stipulates clearly to drivers which type of hazard is appearing first and to what distance ahead.

8.3.12 Guidance for humped bridges is as follows:

'Diagram 528.1 should be used where a bridge parapet… is immediately adjacent to, or encroaches onto, the carriageway.' (TSM Ch.4, 7.1.2)

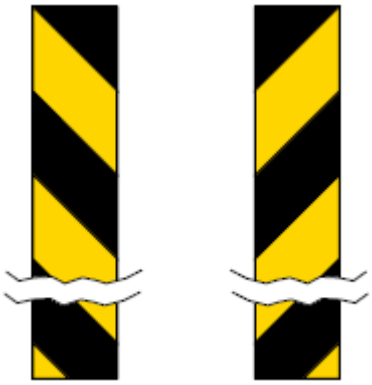


Figure 47 End of Bridge Parapet TSM Ch.4 7-4

8.3.13 It is suggested that the marking shown in Figure 47 be positioned at each corner of the parapets in line with the hazard. Until a full treatment for pedestrian traffic is provided the footway should be closed from both sides. A pedestrians prohibited sign would be unsuitable on an existing footway. Therefore, it would be better to use a temporary 'footway closed' sign sat across the footway instead as this would be more successful at determent.

8.3.14 The western parapet has received impact damage, possibly from both directions. One corner has lost some brickwork and now has a consistent crack all the way down its length. An audit of what investigations and checks of the structure have been done should be carried out to see if it has been surveyed after this damage as well as confirming that none of the brickwork remains loose. Ultimately, an appropriate structural inspection and assessment should be undertaken. Finally, the eastern verge should be cutback and cleared significantly to give improved forward site visibility to the parapet and proposed signing.

8.4. Heathwood Road Layby

8.4.1 During the site visit layby immediately south opposite the Heathwood Road junction shown in Figure 48 was identified as having a substandard layout. The lay-by is in front of two private dwellings with gates access to the rear of the lay-by. The dwellings also have parking and access to the rear. The A41 through this section is subject to a 50mph speed limit.

8.4.2 The lay-by is a type B layby[4] with shortened length of approx. 27m and narrower width of approx. 2.8m. A slot drain and gullies separates the lay-by from the mainline, consequently there are no road markings or road studs. The lay-by has no footway to the rear and acts as a break in the footway. No signing is provided for the lay-by.

[4] For further details of a type B layby refer to DMRB CD169, 4.30N

Figure 48 Heathwood Road Lay-by Existing Arrangement (Source: Google Maps)

8.4.3 Current guidance on lay-bys also states:

'*To avoid noise and visual intrusion and to reduce the possibility of trespassing, parking lay-bys… should be sited away from residential and industrial areas.*' (DMRB CD169, 2.1.1)

8.4.4 Similar guidance applies due to the access it is beside setting the minimum separation of 300m:

'The separation between a lay-by and an access on the same side of the road, both upstream and downstream, shall be at least 3.75V metres where V is the design speed in kph.' (DMRB CD169, 3.7)

8.4.5 Furthermore, Heathwood Road has a footway that joins the A41 and ends at the junction. Although there is no dropped kerb or tactile paving, this is clearly intended to be an uncontrolled crossing to the footway that continues along the A41 on the eastern side. The end of the layby cuts off the footway before this crossing, resulting in not only in the layby being walked across by pedestrians who are using the footway, but the landing point for those using the crossing is the layby itself. This is also an unacceptable arrangement. Additionally, any requirements for the A41 to provide a layby have been removed as it has been de-trunked.

8.4.6 Consequently, it is suggested that the layby be infilled and as part of that treatment, a pedestrian assessment in line with chapters 13-16 of TSM Ch.6 should be undertaken to determine if a crossing is needed and what type, as the existing uncontrolled crossing with dropped kerb is not suitable for the existing 50mph road with three lanes. It should be noted that only one serious collision occurred at this junction, and it did not involve a pedestrian, but it can be seen from the street view that this appears to be a popular crossing point for dog walkers heading into the forest from Prees Higher Heath.

8.4.7 Finally, there is currently junction hazard warning signing for the Heathwood Road junction which uses a staggered junction variant. However, the westward access which these signs refer to is private. For consideration, these signs could be replaced with the single junction hazard variation instead to maintain consistency along the route. It is not recommended to provide signing for a private access in this one instance over all others along the route. Attempting to provide signing for accesses would certainly result in saturation of such hazard signs, reducing their efficacy and has been avoided as a recommendation for all other locations.

9. Conclusions and Recommendations

9.1. Conclusions and Recommendations

9.1.1 This options report has formed the second part of the A41 route study and provided an assessment of the route and identified options for whole route and cluster site treatments to address the collisions occurring along the route.

9.1.2 The section of the A41 subject to this study was found to have varied asset condition. The assessments and subsequent recommendations made in this report cover a wide range of asset types, considerations, layouts, and treatments. Issues that were identified included the following:

- Collision analysis from the technical note identified a high KSI severity ratio compared to other A roads confirming it to be a stretch experiencing significant collisions.
- Cluster Site analysis had found six sites which conclusively showed trends of collisions needing addressed.
- The site visit observed a number of recurring issues with poor signing offsets, worn markings, substandard arrangements and non-standard street furniture.
- Most private accesses have no retroreflective hazard marking and a number of junctions were found to have insufficient arrangements such as corner radii or minor lane widths.
- Parts of the carriageway were found to be inconsistent regarding lane widths, edge lines, hard strips and surface condition.

9.1.3 The observations taken from the site visit led to the following proposals being made:

- Correction of signing offsets and face sizes to regulation standards.
- Treatments to bring consistency to both directions of travel.
- Identification of over 127 existing defects of assets and road condition of the route to both support the existing maintenance regime and be rolled into other improvement schemes.

9.1.4 Alongside this, analysis was carried out for several sets of provided data which were used to identify potential risks and considerations for improvements were made:

- Proposed increases to investigatory levels of PSV’s for given arrangements.
- Affirmation of the existing safety camera strategy and provisions for future changes.
- Identification and recommendations for flood zones.

9.1.5 Recommendations have been provided which covered all considered whole route treatments. Common options that have been proposed include:

- Design of carriageway layout provided to maintain consistency of route.
- Upgrades to private accesses to increase visibility, especially at night.
- Corrections and improvements to non-standard or non-passively safe signing.
- A warning sign tier system to provide route hazard consistency.
- Suggested standardisation of street furniture assets.
- Streamlined of use of edge lines to maintain route efficacy in darkness.

9.1.6 Each cluster site brought forward from the technical note was reviewed in detail covering its existing arrangement, layout, and condition. Proposed treatments and recommendations were then made for each site. Finally, a handful of other locations which were either brought to attention or identified during the visit were then given consideration and potential solutions provided:

- A series of conclusions, suggestions, and treatments to tackle existing cluster sites including detailed provision of their existing condition.
- Layout improvements and treatment options to additional locations, some with multiple options provided.

10. References

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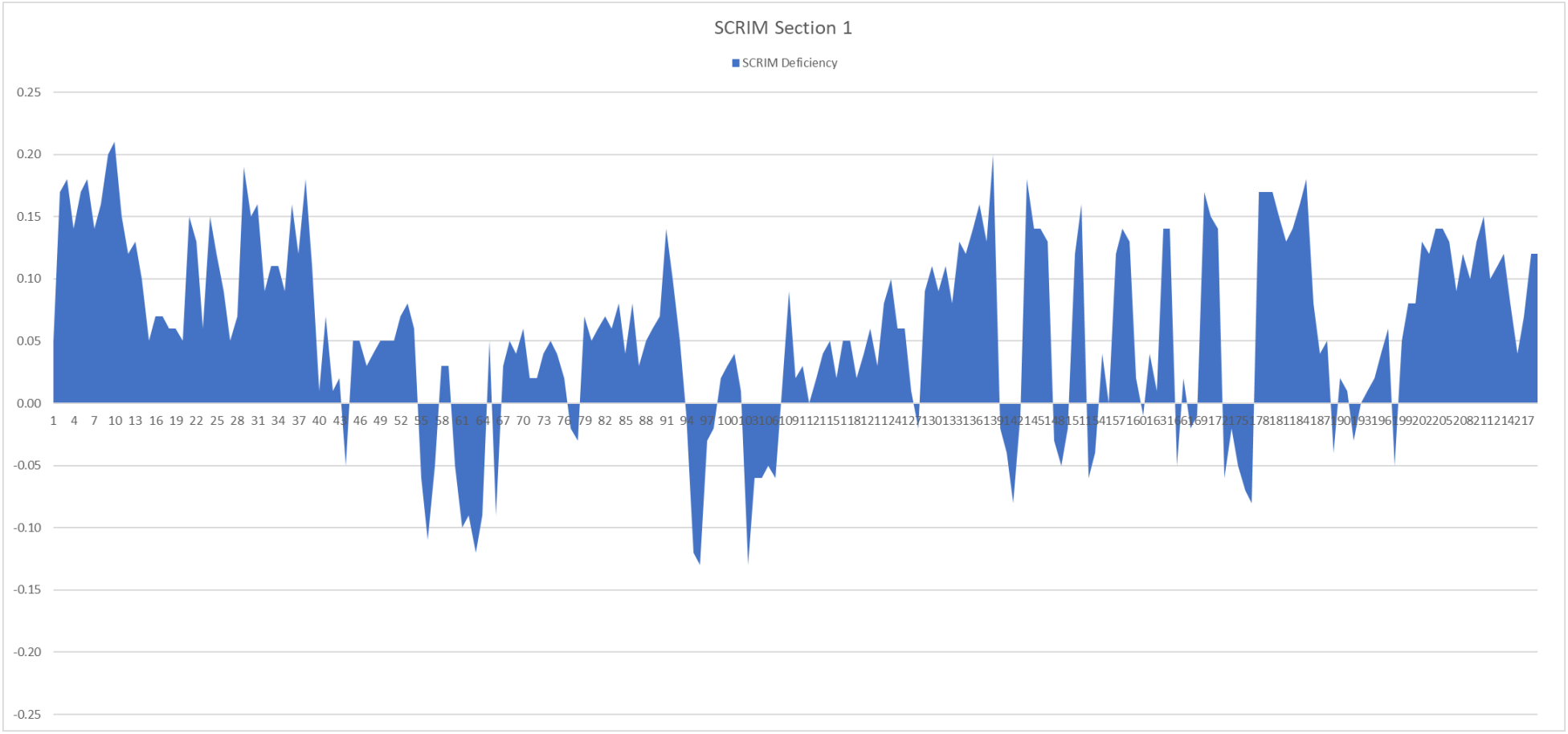
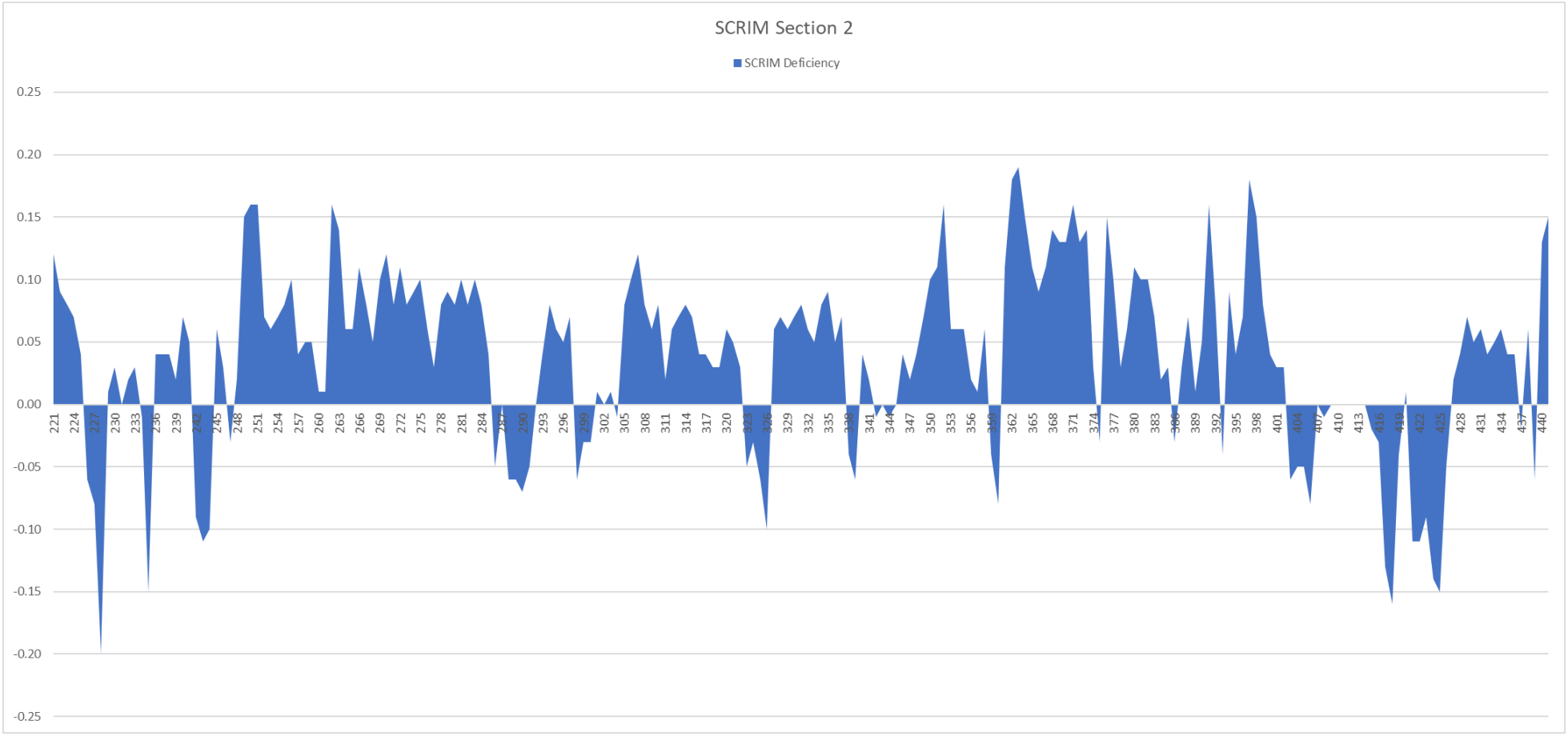
Transport Research Laboratory. “Route Safety Management and Evaluation Guidance PPR398.” 2009.

Appendix A: SCRIM Data – Deficiency Charts




SCRIM Section 2
SCRIM Deficiency
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-0.05
-0.10
-0.15
-0.20
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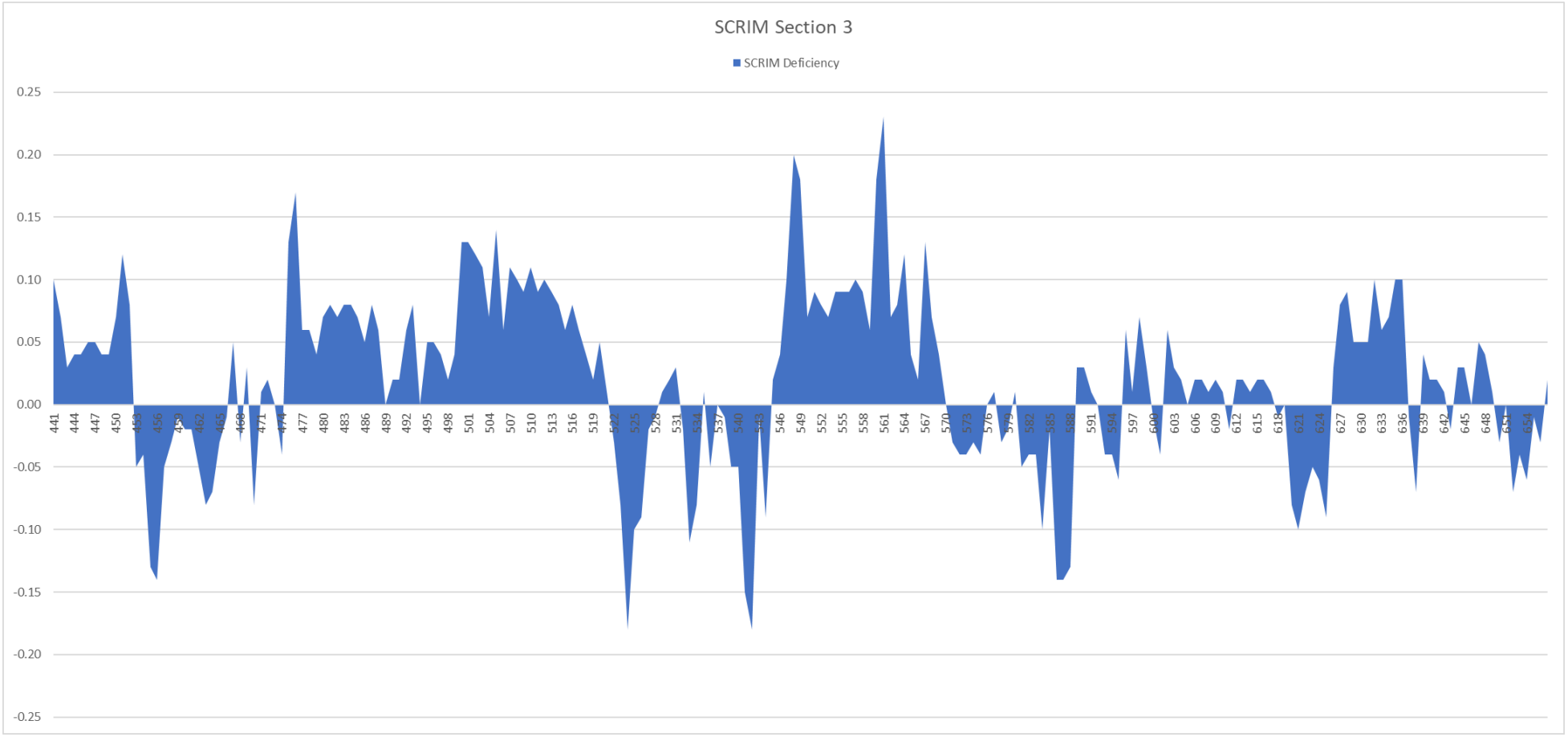
SCRIM Section 3
SCRIM Deficiency
0.25
0.20
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Appendix B: Site Observations

Section 1: Tong Interchange to Pickmere Roundabout (1 of 2)

ASSET	LOCATION	ISSUE
Carriageway	Tong interchange exit	Road surface is in poor condition
Road markings	Tong interchange exit	Edge lines begin abruptly at drain cover
Signage	Tong interchange exit	SB roundabout ADS is obscured by treeline
Lighting and signage	Stanton Road Junction	Street lighting and minor road signage has poor offset to edge of carriageway, minor road signage across main carriageway has been completely knocked over
Signage	North of Stanton Road junction	SB ADS has bottom panel askew, poor offset
Road markings	North of Stanton Road junction	Edge lines replace end of kerb but then disappear shortly after
Road markings	Bell Inn accesses	Markings demarcating edge of carriageway are completely worn at all 3 accesses
Signage	Bell Inn accesses	SB right turn lane lacking No Entry signs for petrol station exit
Road markings	Bell Inn ghost island	NB Right turn lane is missing 2nd right turn arrow and has no diagonal hatching demarcating centre lane
Road markings	North of Bell Inn	Edge lines at field accesses and private accesses are not dashed to indicate access (X5)
Signage	North of Bell Inn	Both SB junction warning signs are bent, slightly obscured and leaning
Road markings	South of 22 Tong Havana	Edge lines end but are not replaced by kerbing on one side (likely overgrown)
Carriageway	North of 22 Tong Havana	Carriageway widens to 5m width for short stretch here
Road markings	Layby north of 22 Tong Havana	Markings demarcating edge of carriageway are completely worn for both layby entrance and exit

Section 1: Tong Interchange to Pickmere Roundabout (2 of 2)

ASSET	LOCATION	ISSUE
Marker posts	Layby north of 22 Tong Havana	Marker posts are very dirty and slanting, there is a marker post at end of exit but not beginning of entrance, no marker post at island exit nose
Signage	Between both laybys	NB Junction warning sign is too small for road speed
Carriageway	Between both laybys	No edge lines but kerbing is overgrown along large stretch
Road markings	Lizard Mill farm junction	Junction markings heavily worn
Marker posts	Lizard Mill farm layby	Marker posts dirty and slanted, missing at island exit nose, some along island and at beginning of entrance
Signage	North of Lizard Mill farm layby	SB junction warning sign is too small for road speed
Road markings	South of Pickmere roundabout	No edge lines or visible kerbing here, verge likely overgrown
Signage	South of Pickmere roundabout NB entrance	Roundabout ADS, freight sign and directional sign all overgrown by hedge line, no roundabout warning sign
Signage	Pickmere roundabout NB entrance	No stopping sign is double plated but facing wrong direction for SB traffic to see, would need separate pole for correct facing
Signage	Pickmere roundabout	Some roundabout chevron signs have yellow backplate whilst others do not, one chevron is also knocked down. The one way signs should be located in the centre of the chevron arrangement.
Road markings	Pickmere roundabout	All roundabout entrance marking lines are heavily worn
Carriageway	Pickmere roundabout	Rut has developed along centre line of roundabout road and southern exit has heavily cracked patch in centre

Section 2: Pickmere Roundabout to B4379 Junction

ASSET	LOCATION	ISSUE
Signage	Pickmere roundabout NB exit	NB nearside No stopping sign turned and slightly obscured by hedge, layby parking sign leaning
Carriageway	North of Pickmere roundabout	Road surface is of poor condition
Road markings	South of Chatwell Lane	Overall centre line condition is poor along this stretch
Layby	South of Chatwell Lane	Unmarked and unsigned SB layby with no footway
Signage	South of Chatwell Lane	NB signage for Burlington ½ mile is leaning and missing a post
Signage	North of Chatwell Lane	NB slippery road sign is too small size for road speed and safety camera sign is askew and heavily worn
Road markings	King St junction	Centre line and minor road markings are all poor quality here
Signage	North of King St junction	SB ADS for junction has a poor offset and bottom panel is missing, middle panel is askew and bent. The large SB direction sign directly after has no panels and is just posts
Signage	South of Damson Lane	NB directional signage is obscured by foliage and panels are askew
Signage	North of Hand Lane	Both NB and SB chevrons are slightly obscured by hedge line, would also benefit from having a 3rd sign in the middle as there is a large gap between the two
Road markings	North of Hand Lane	Resurfaced drainage covers have edge lines painted for their squares but edge lines are not present along this stretch
Signage	South of Bloomsbury garage	SB nearside junction hazard warning sign is dirty
Road markings	North of Bloomsbury garage	Edge lines are present here but very poor condition
Signage	North of Bloomsbury garage	Both SB chicane hazard warning signs are dirty
Signage	South of B4379 junction	NB ADS for junction has poor offset and has bottom panel askew
Signage	B4379 junction	Minor road signage across main carriageway is askew or on ground and dirty

Section 3: B4379 Junction to A518 Northern Roundabout

ASSET	LOCATION	ISSUE
Signage	NRS aggregates access	Blue directional signage is entirely obscured by hedge line
Signage	North of NRS aggregates access	Large SB ADS is dirty and has poor offset
Signage	North of NRS aggregates access	NB nearside safety camera sign is obscured by tree
Signage	North of NRS aggregates access	SB nearside directional sign for Lynn junction is missing all but one panel and NB facing equivalent is missing
Signage	North of NRS aggregates access	NB offside Woodcote sign obscured by hedge as well as the SB junction hazard warning sign behind it
Signage	North of NRS aggregates access	Bend Chevron sign is missing for NB and the SB chevron is turned making it visible to NB traffic. Both have trees overgrown above them
Signage	South of Pave Lane junction	NB offside slippery road warning sign is too small for road speed and mounted too low
Road markings	Pave Lane junction	The central taper for the SB right turn lane should be hatched for longer until the central lane is of adequate width and a thick boundary line should be applied as standard
Road markings	North of Pave Lane junction	The centre line here is of poor condition
Signage	North of Chetwynd Aston bridge	The SB offside safety camera sign is missing
Layby	North of Chetwynd Aston bridge	Both Laybys missing footway
Signage	A518 southern roundabout	NB approach has cycles hazard sign too small for road speed
Signage	Premier Inn junction	A41 (A518) sign is unseated and propped sideways

Section 4: A518 Northern Roundabout to Marsh Lane Junction

ASSET	LOCATION	ISSUE
Footway	A518 northern roundabout	Northern traffic island crossing has no tactile paving
Signage	South of Chester Road junction	NB nearside cycles hazard warning sign too small for road speed and a bit dirty
Signage	South of Chester Road junction	NB direction has no junction hazard warning sign except the VAS
Signage	North of Chester Road junction	SB direction has no junction hazard warning sign except the VAS
Layby	Round Hill wood	NB layby has insufficient entry and exit tapers and no footway, and missing edge line
Layby and Marker posts	Round Hill wood	SB layby is missing all marker posts and the traffic island lacks sufficient kerbing
Signage	Marsh Road junction	There is no junction hazard warning sign for SB direction
Layby	North of Standford services	SB layby has insufficient entry and exit tapers and no footway
Signage	North of Standford services	Bend chevrons should be doubles if possible and have improper yellow border
Signage	Sambrook junction	NB direction missing junction hazard warning sign

Section 5: Marsh Lane Junction to Newcott Fish & Chips

ASSET	LOCATION	ISSUE
Signage	North of Marsh Lane	NB offside no stopping sign is obscured by hedge line, nearby other signs are close to becoming obscured
Road markings	Hooks Lane junction	Minor road markings heavily worn, surface also in poor condition
Road markings	Villa Farm Close	The NB right turn lane is only 12m in length, whilst SB direction has 63m, the centre line should be split more evenly to ensure enough space for vehicles to straighten in the lane
Signage	South of Hatton Road junction	NB slippery road sign obscured by hedge line as well as later directional and freight signs
Bollards	Wistanswick southern crossroads	SB nearside minor road traffic island has no keep left bollard
Signage	South of Blooming Barkers	NB offside Rosehill sign missing
Signage	South of Blooming Barkers	NB nearside bend hazard warning sign has bent post
Signage	Blooming Barkers	Bend chevrons slightly obscured both directions, would also benefit from additional sign
Signage	North of Blooming Barkers	NB offside crossroads hazard warning sign missing supplementary reduce speed now plate and nearside sign is size too small for road speed
Signage	Rosehill bridge parapets	Lack of blind summit/hidden dip hazard signs (consider)

Section 6: Newcott Fish & Chips to Ternhill Roundabout

ASSET	LOCATION	ISSUE
Road markings	North of Newcott Fish and Chips	SB edge lines obscured by verge
Signage	South of Warrant Road junction	NB ADS obscured by hedge line
Bollards	Warrant Road junction	Bollards on both minor road traffic islands are dirty
Signage	Warrant Road junction	NB nearside directional signs are dirty and SB nearside directional sign is dirty
Road markings	Warrant Road junction	Both minor road give way markings are heavily worn
Signage	Warrant Road junction	SB nearside tourist directional sign is obscured by hedge line
Signage	South of Hedley Way junction	SB has a hazard warning sign for helicopters with ½ mile notation but there is no equivalent for NB
Signage	South of Hedley Way junction	SB nearside unrestricted speed limit sign is heavily bleached
Road markings	Hedley Way junction	Centre line and ghost island road markings are heavily worn for a long stretch
Bollards and footway	North of Hedley Way junction	Central refuge island bollards are both dirty and footway is entirely overgrown and packed with dirt
Road markings	North of Hedley Way junction	Minor road give way lines for the caravan place do not match alignment with the other two junctions directly beside it
Road markings	Riverside Drive junction	Minor road has a bus stop with no identifying markings, almost looks like an auxiliary lane or layby
Signage	North of Riverside Drive junction	NB unrestricted speed limit signs on both sides are extremely bleached
Road markings	South of Ternhill roundabout	Edge lines just end abruptly before proper demarcation into 2 lanes, lane lines are heavily worn
Signage	South of Ternhill roundabout	SB 40 repeater signs are dirty, bleached and slightly obscured by trees
Carriageway	Ternhill roundabout	All centre line road studs for 50m along the southern approach are missing and have been filled in
Footway	Ternhill roundabout	All crossings here have tactile paving in very poor condition and refuges are not raised or sufficient
Signage	Ternhill roundabout	Roundabout chevrons have improper yellow border

Section 7: Ternhill Roundabout to Green Lane Crossroads

ASSET	LOCATION	ISSUE
Road markings	North of Ternhill roundabout	Both the access to the petrol station and nearby private access have their demarcation lines almost entirely worn or covered
Carriageway	North of Ternhill roundabout	No edge lines but NB nearside kerbing is consistently overgrown for this stretch
Signage	North of Ternhill roundabout	NB nearside dead-end sign is in poor condition and no equivalent for SB direction
Signage	North of Chapel Lane junction	NB nearside parking sign is partly obscured by hedge line
Layby & Marker posts	North of Chapel Lane junction	NB layby missing all marker posts and footway
Signage	North of Chapel Lane junction	NB nearside ADS is missing top panel
Signage	South of Moreton Say junction	NB nearside dual carriageway sign offset obscured by hedge line
Signage	Moreton Say junction	NB nearside directional sign is bent and panels misaligned
Carriageway	Dual carriageway	NB Road surface is poor and lane lines are heavily worn
Signage	Dual carriageway	NB bend hazard warning sign in centre verge is missing backplate and max speed notation to match nearside sign
Signage	Dual carriageway	SB lane merge hazard warning sign in centre verge is bleached and nearside sign and pole are flat on ground
Signage	Dual carriageway	Centre and SB verge chevron signs often have one chevron for both directions and a few with improper border
Signage	Dual carriageway	SB bend hazard warning sign in centre verge is missing yellow backplate to match nearside sign (x2)
Layby	South of Sandford Farm	Laybys for both directions have insufficient tapers and no footway, NB layby is also too short
Lighting and signage	Sandford Farm	NB nearside amber lights leaning and dirty and missing equivalent cattle hazard warning signs given for SB
Carriageway	Sandford Farm	NB nearside access has diverge lane which is too narrow for vehicles
Signage	Sandford Farm	NB offside directional sign is becoming obscured, overgrown and has askew panel
Signage	North of Sandford Farm	NB Chevron signs are single chevrons with improper yellow border
Signage	B5065 junction	SB double Chevron signs have improper yellow border and middle sign is obscured
Signage	South of Green Lane crossroads	SB nearside dual carriageway sign is dirty

Section 8: Green Lane Crossroads to Prees Heath Roundabout

ASSET	LOCATION	ISSUE
Carriageway	Entire section	Road surface condition is poor
Carriageway	Entire section	Most studs are missing eyes
Road markings	Entire section	Centre lines, edge lines and ghost islands here are all in poor condition and inconsistently visible
Signage	Green Lane crossroads	NB nearside ADS is missing centre panel
Signage	North of Green Lane crossroads	NB nearside safety camera, mileage and junction hazard warning signs are all obscured by hedge line
Road markings	Manor House Lane junction	Minor road give way lines heavily worn
Signage	North of Manor House Lane junction	SB nearside ADS has poor offset and has two panels bent and is dirty
Signage	Mill Lane	SB is missing a direction sign for Mill Lane which exists for NB
Signage	Heathwood Road junction	Junction hazard warning signs for both directions use staggered junction symbol but the road to WLJA Forrester is private
Signage	North of Heathwood Road junction	NB nearside junction hazard warning sign is dirty as are 50 repeater signs for both directions
Signage	South of Prees Heath roundabout	SB nearside Higher Heath 50 sign is missing top panel and has inside post leaning
Signage	South of Prees Heath roundabout	NB nearside slippery road warning sign is completely bleached
Signage	South of Prees Heath roundabout	SB has a cattle hazard warning sign for ¼ mile but no equivalent for NB
Signage	South of Prees Heath roundabout	NB nearside roundabout ADS is obscured by trees

Appendix C: TSM Chapter 4 Appendix A Siting and Sizing of Warning Signs

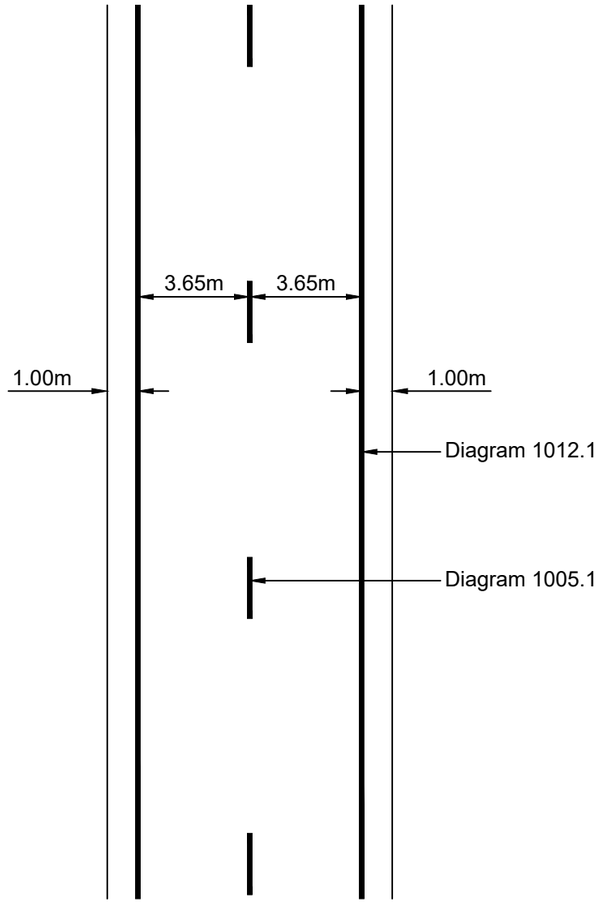
85TH PERCENTILE SPEED (MPH)	CLEAR VISIBILITY DISTANCE BELOW WHICH AN ADVANCE WARNING SIGN SHOULD BE PROVIDED	SIZE OF ADVANCE WARNING SIGN (MM)	SUPPLEMENTARY PLATE X-HEIGHT (MM)	DISTANCE OF ADVANCE WARNING SIGN FROM STOP OR GIVE WAY LINE
Up to 30	45	600	62.5	45
31 to 40	**60**	**750 (600)**	**75 (62.5)**	**45-110**
41 to 50	**90 (150)**	**900 (750)**	**100 (75)**	**110-180**
Over 50	**150**	**1200 (900)**	**125 (100)**	**180-245**

Appendix D: Drawings

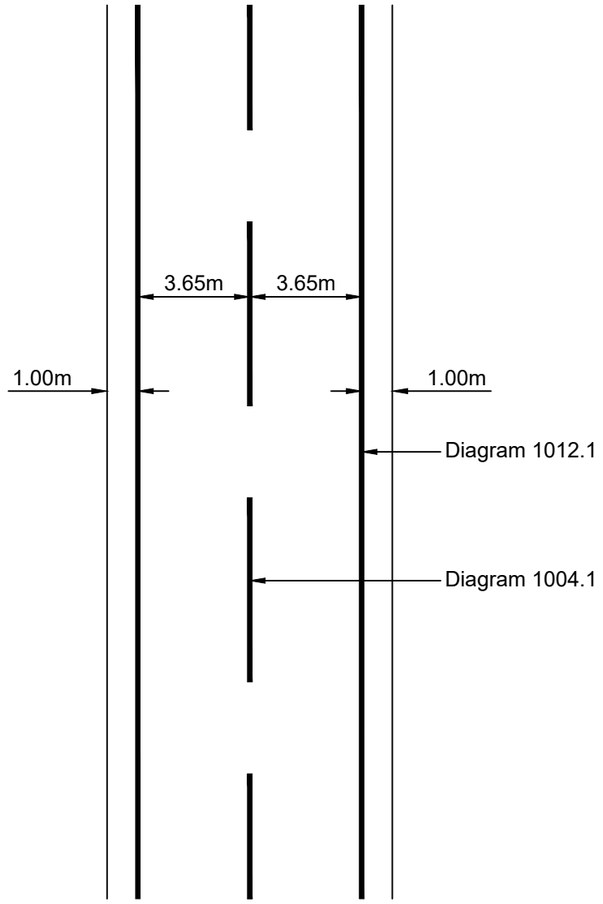
DRAWING NO.	REFERENCE	TITLE
0001	COMHA1T&W038-AMY-GEN-A41-DR-CH-0001	Carriageways
0002	COMHA1T&W038-AMY-GEN-A41-DR-CH-0002	Accesses
0003	COMHA1T&W038-AMY-GEN-A41-DR-CH-0003	Side Road
0004	COMHA1T&W038-AMY-GEN-A41-DR-CH-0004	Bend
0005	COMHA1T&W038-AMY-GEN-A41-DR-CH-0005	Double White Lines
0006	COMHA1T&W038-AMY-GEN-A41-DR-CH-0006	Newport Bypass Junction 1
0007	COMHA1T&W038-AMY-GEN-A41-DR-CH-0007	Marker Post
0008	COMHA1T&W038-AMY-GEN-A41-DR-CH-0008	Bollard
0009	COMHA1T&W038-AMY-GEN-A41-DR-CH-0009	Newport Bypass Junction 2
0010	COMHA1T&W038-AMY-GEN-A41-DR-CH-0010	A41 Cluster 2
0011	COMHA1T&W038-AMY-GEN-A41-DR-CH-0011	A41 Cluster 4
0012	COMHA1T&W038-AMY-GEN-A41-DR-CH-0012	A41 Cluster 5
0013	COMHA1T&W038-AMY-GEN-A41-DR-CH-0013	A41 Cluster 6
0014	COMHA1T&W038-AMY-GEN-A41-DR-CH-0014	A41 Cluster 7
0015	COMHA1T&W038-AMY-GEN-A41-DR-CH-0015	A41 Cluster 8
0016	COMHA1T&W038-AMY-GEN-A41-DR-CH-0016	A41 Cluster 9
0017	COMHA1T&W038-AMY-GEN-A41-DR-CH-0017	A41 Cluster 10
0018	COMHA1T&W038-AMY-GEN-A41-DR-CH-0018	A41 Cluster 12
0019	COMHA1T&W038-AMY-GEN-A41-DR-CH-0019	A41 Cluster 13

0 100

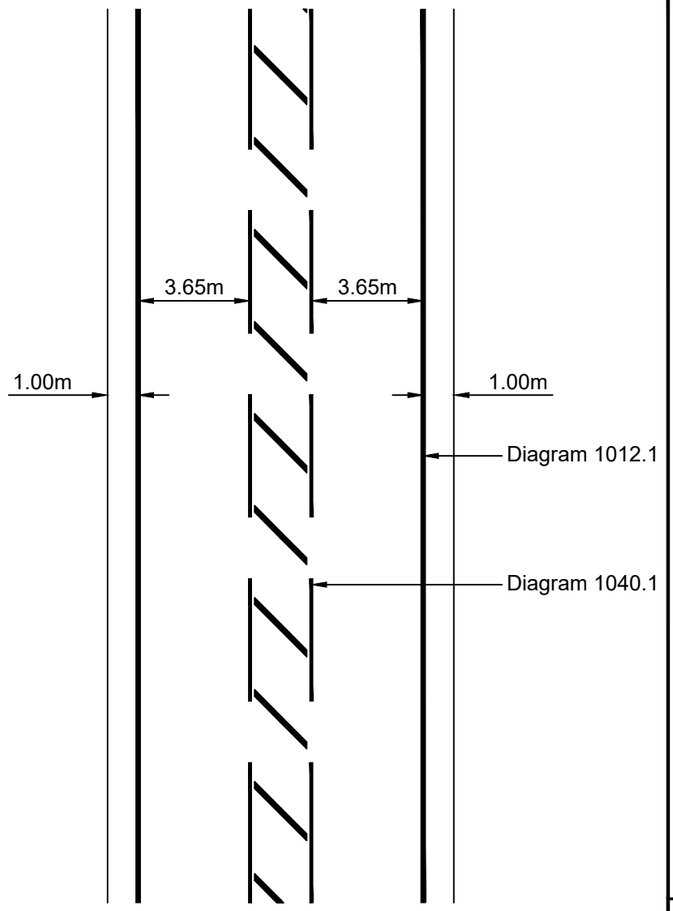
Centre Lines Plan



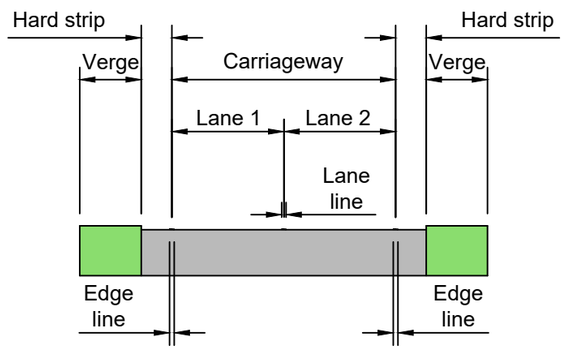
Warning Lines Plan



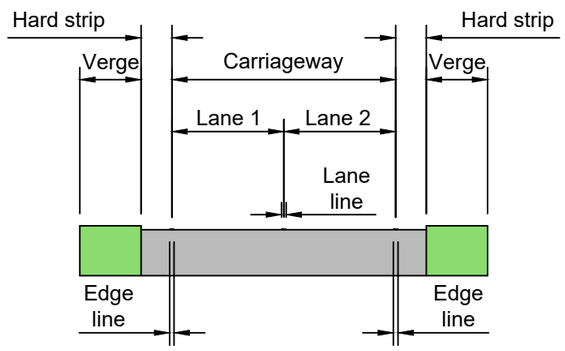
Hatched Lines Plan



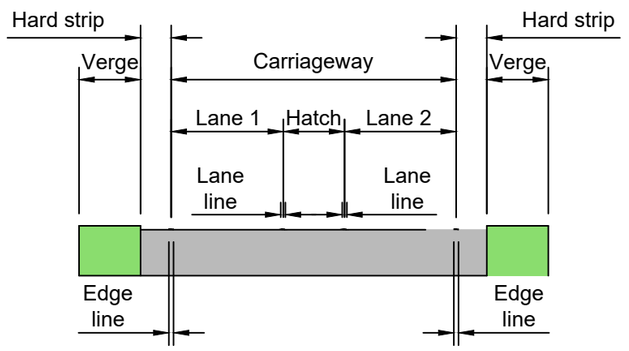
Centre Lines Front Elevation



Warning Lines Front Elevation



Hatched Lines Front Elevation



General Notes

1. This drawing is for reference only and is not to be scaled.
2. All measurements shown are in METRES, unless stated otherwise and are approximate.
3. Diagrams referenced from Traffic Signs Manual Chapter 5.
4. Recommendations for arrangements provided in Options Study Report COMHA1T&W038-OS-001 as follows:
   - Centre lines in sections 6.2 and 6.3
   - Warning lines in sections 6.3 and 6.4
   - Hatched lines in section 5.1
5. Hard strip of 1m width shown is as per CD127. A relaxation to 0.5m or absolute min of 0.3m could be applied where space is limited and there is approval from the highway authority.
6. Where a hard strip cannot be provided but edge lines remain, then minimum offset should be 225mm.
7. Road markings should have a minimum performance value of R3 (150 MCD) or R4 (200 MCD) dry and RW3 wet (50 MCD) performance where enhanced performance in required. RW2 (35 MCD) should be applied at all other locations. This is in accordance with Table NA.1 in BS EN1436:2018.

Designed:	MG	Date:	16/01/2024
Drawn:	MV	Date:	16/01/2024
Checked:	GH	Date:	23/01/2024
Approved:	HH	Date:	09/02/2024

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Working on behalf of

Telford & Wrekin COUNCIL

Project Name
A41 Route Study

Drawing Title
Whole Route Treatment Option - Carriageways

Project Ref. No: COMHA1T&W038	Scale : Not to Scale @ A3
Stage: Conceptual Design	Dimensions : m

Drawing Number

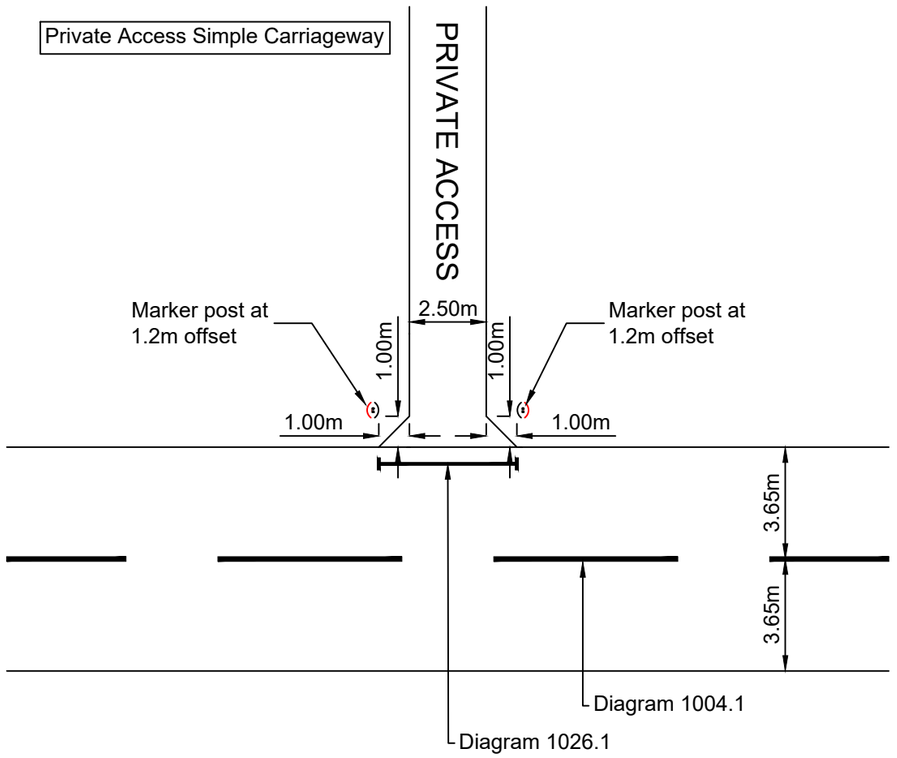
Project Number	Originator	Volume
COMHA1T&W038	AMY	GEN

Location	Type	Role	Number
A41	DR	CH	0001

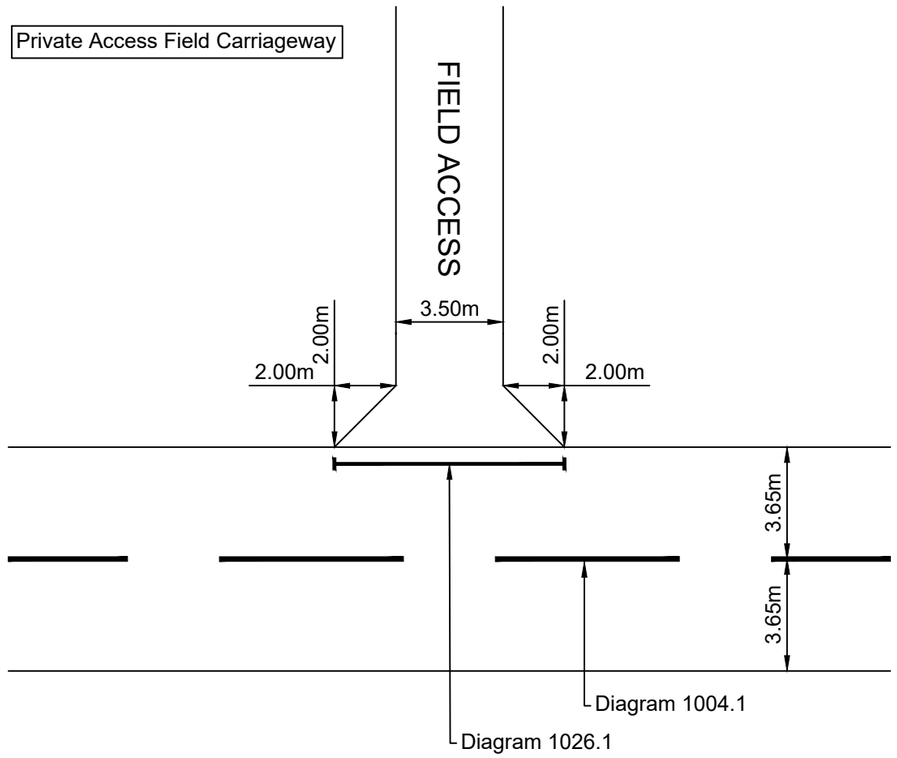
Suitability	Suitability Description	Revision
S2	Suitable For Information	P01

0 100

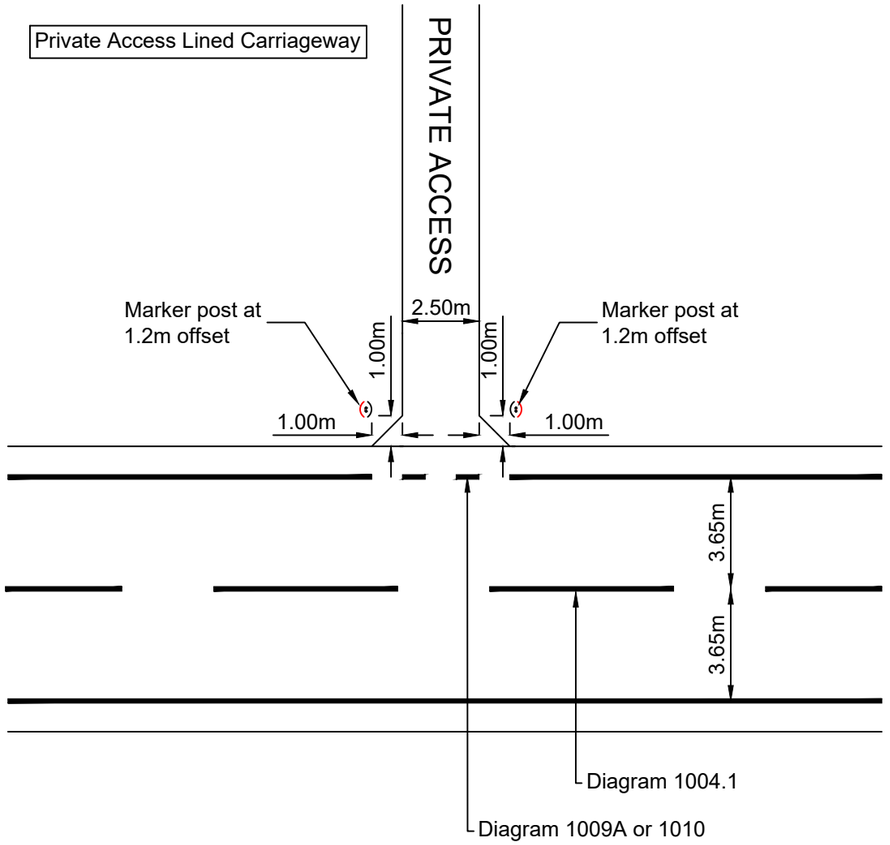
Private Access Simple Carriageway



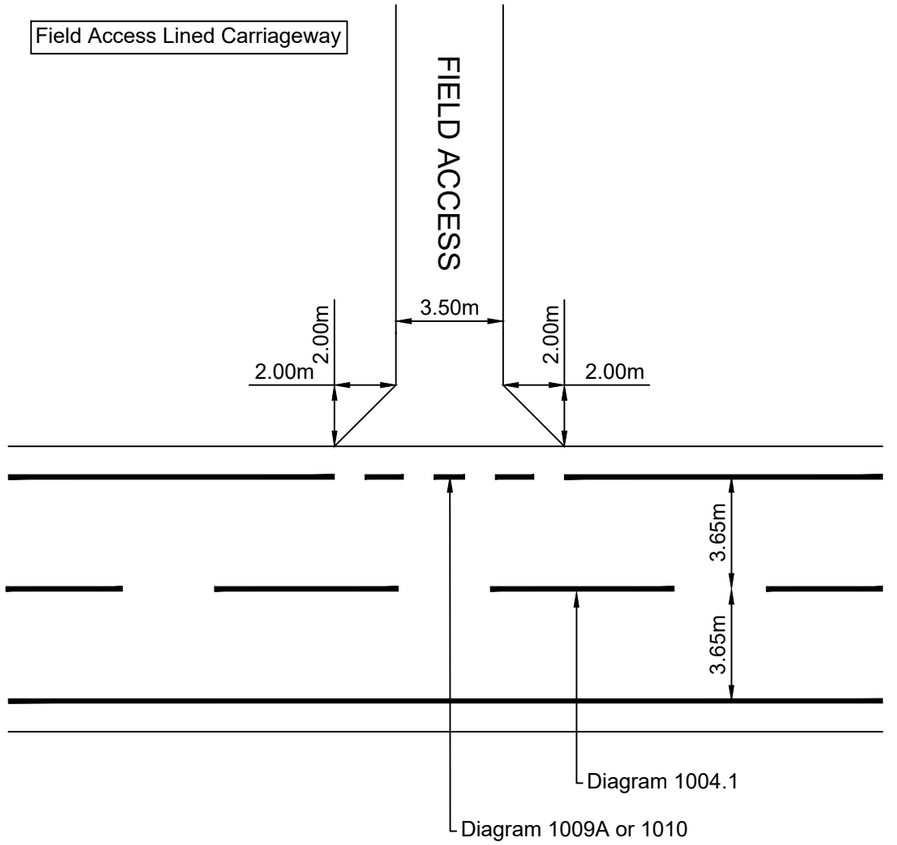
Private Access Field Carriageway



Private Access Lined Carriageway



Field Access Lined Carriageway



General Notes

1. This drawing is for reference only and is not to be scaled.
2. All measurements shown are in METRES, unless stated otherwise and are approximate.
3. Diagrams referenced from Traffic Signs Manual Chapter 5.
4. Where diagram 1010 used, green studs at 8m centres are an optional addition. Consideration could also be given to a departure for a reduction in spacing to 3m where deemed appropriate.
5. Recommendations for arrangements provided in sections 6.2 and 6.5 of Options Study Report COMHA1T&W038-OS-001 to include marker posts and dashed edge lines where required.
6. All diagrams reference example access arrangements as existing. Lined diagrams including edge lines are preferred where edge lines are to be present. H-bars are not recommended for implementation and are shown indicatively only.
7. Example marker post/bollard details given in COMHA1T&W038-AMY-GEN-A41-DR-CH-0007, COMHA1T&W038-AMY-GEN-A41-DR-CH-0008.
9. Access arrangements have been proposed for the following cluster sites relevant drawings: COMHA1T&W038-AMY-GEN-A41-DR-CH-0010, COMHA1T&W038-AMY-GEN-A41-DR-CH-0011, COMHA1T&W038-AMY-GEN-A41-DR-CH-0013, COMHA1T&W038-AMY-GEN-A41-DR-CH-0014, COMHA1T&W038-AMY-GEN-A41-DR-CH-0015, COMHA1T&W038-AMY-GEN-A41-DR-CH-0019.

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Drawn:	MV	Date:	16/01/2024
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Approved:	HH	Date:	09/02/2024

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Project Name
A41 Route Study

Drawing Title
Whole Route Treatment Option - Accesses

Project Ref. No: COMHA1T&W038	Scale : Not to Scale @ A3
Stage: Conceptual Design	Dimensions : m

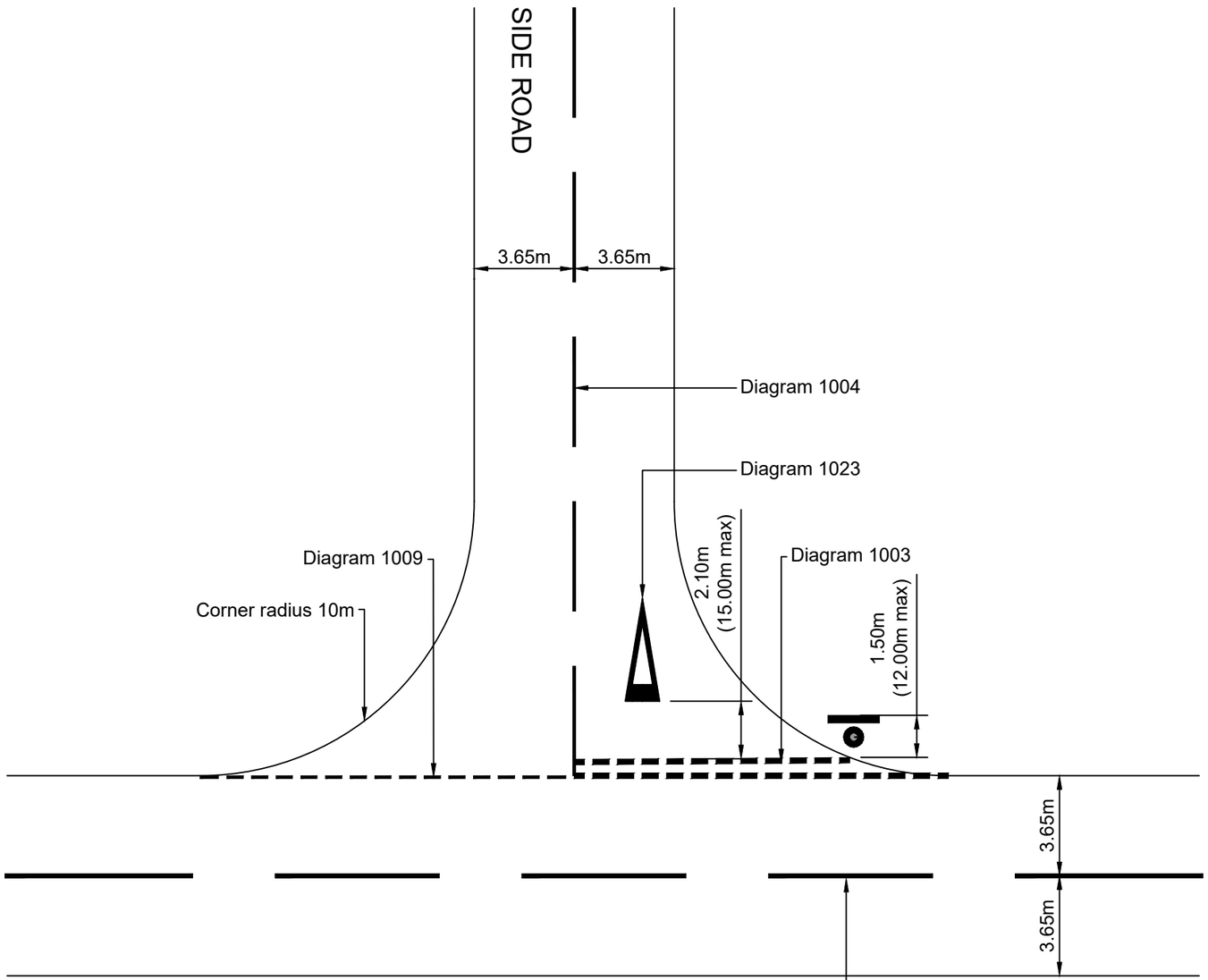
Drawing Number

Project Number	Originator	Volume	Location	Type	Role	Number
COMHA1T&W038	AMY	GEN	A41	DR	CH	0002

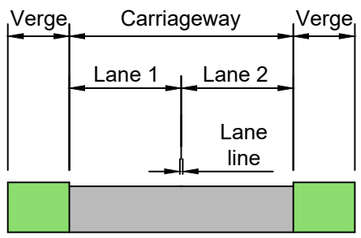
Suitability	Suitability Description	Revision
S2	Suitable For Information	P01

0 100

Side Road Junction Plan



Side Road Junction Front Elevation



General Notes

1. This drawing is for reference only and is not to be scaled.
2. All measurements shown are in METRES, unless stated otherwise and are approximate.
3. Diagrams referenced from Traffic Signs Manual Chapter 5.
4. Side Road shown is for a simple junction without ghost island provision.
5. Typical direction signs on both approaches not shown.
6. To be used in accordance with hazard signing tier system upon main carriageway approach shown below:

HAZARD SEVERITY	BEND/JUNCTION SIGN ARRANGEMENT
Tier 1	Hazard signs provided as a pair on both verges
Tier 2	Yellow or grey backing plate added
Tier 3	'Reduce speed now' plate added

7. Tier 1 signing arrangment should be used as default with tier 2 used with hazards where greater care is required. Tier 3 hazard signage should only be used for the most difficult and dangerous hazards with a clear collision history.
8. Recommendations provided in sections 6.5 and 6.7 of Options Study Report COMHA1T&W038-OS-001.
9. Appropriate direction signing should also be provided in accordance with LTN 1/94 where appropriate.

Designed:	MG	Date:	16/01/2024
Drawn:	MV	Date:	16/01/2024
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Approved:	HH	Date:	09/02/2024

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Project Name
A41 Route Study

Drawing Title
Whole Route Treatment Option - Side Road

Project Ref. No: COMHA1T&W038	Scale : Not to Scale @ A3
Stage: Conceptual Design	Dimensions : m

Drawing Number

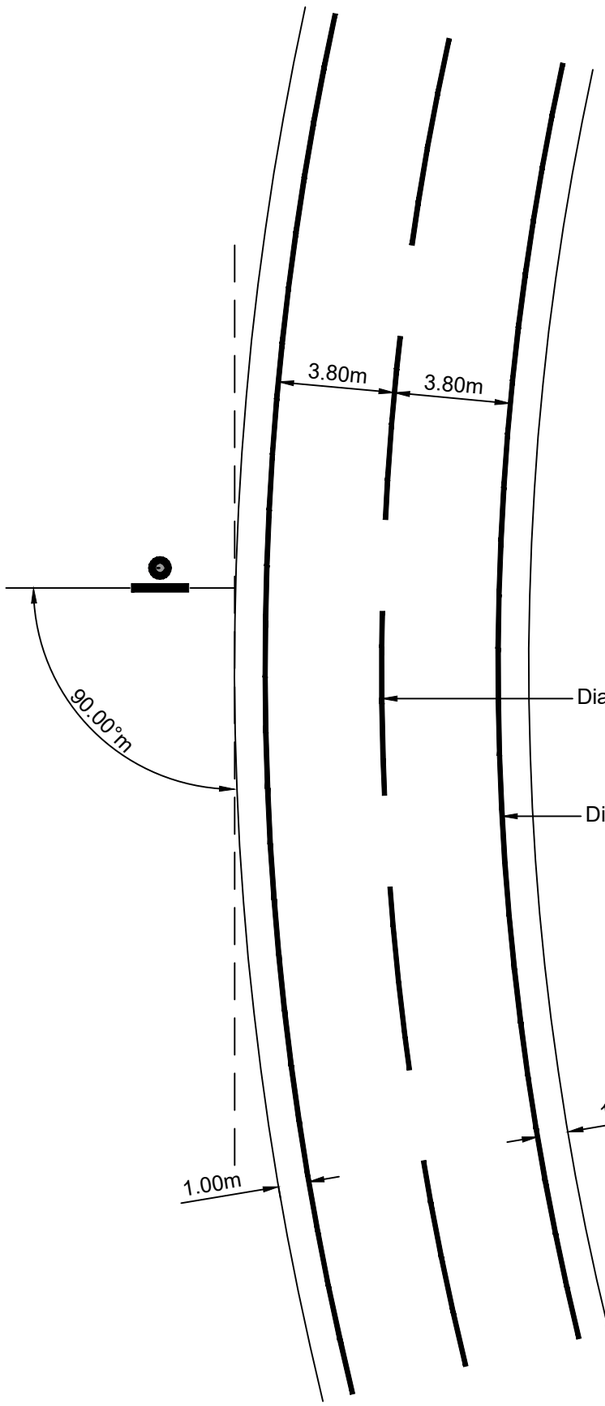
Project Number	Originator	Volume
COMHA1T&W038	- AMY -	GEN

Location	Type	Role	Number
A41	-DR-	CH-	0003

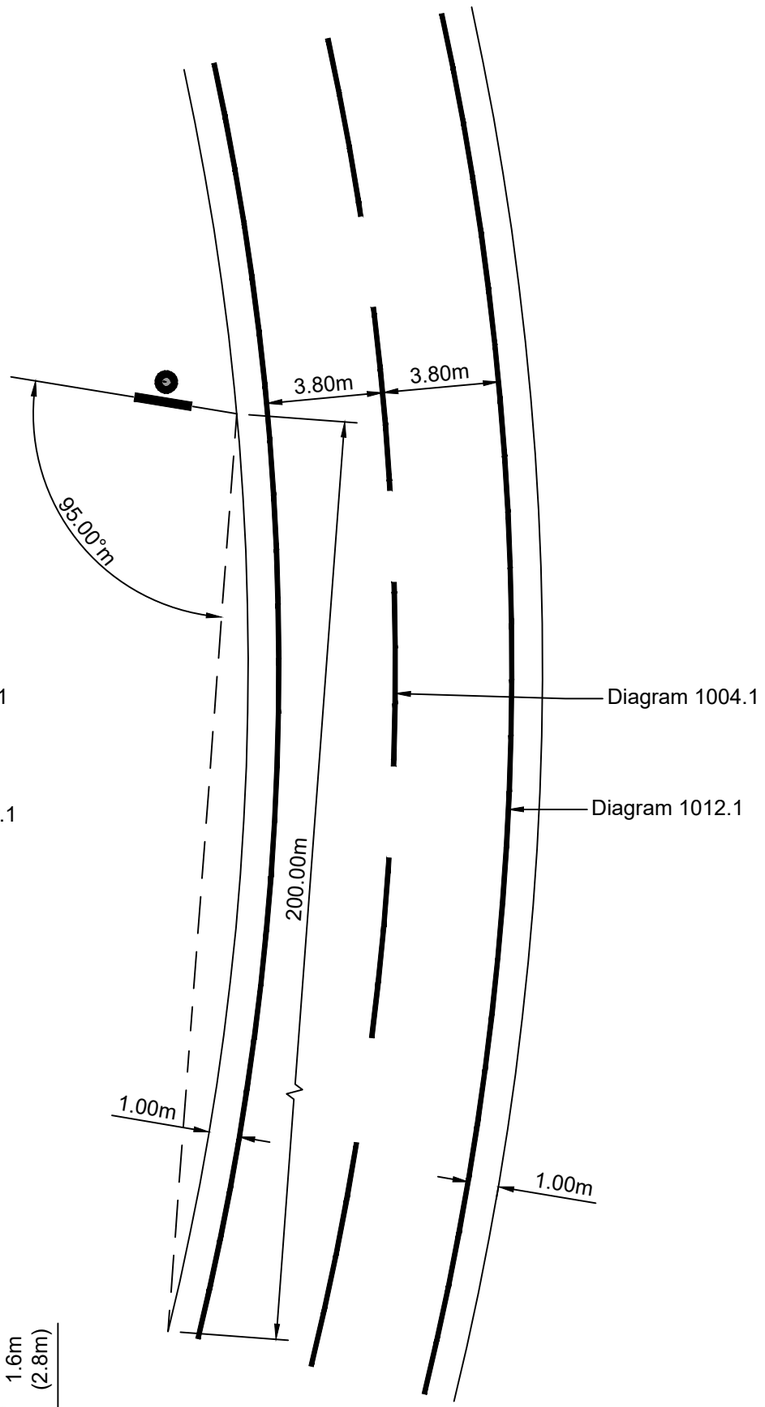
Suitability	Suitability Description	Revision
S2	Suitable For Information	P01

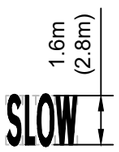
0 100

Right Bend

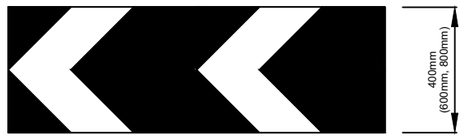


Left Bend





Slow markings to be provided in advance of the bend.



General Notes

1. This drawing is for reference only and is not to be scaled.
2. All measurements shown are in METRES, unless stated otherwise and are approximate.
3. Diagrams referenced from Traffic Signs Manual Chapter 5.
4. Sign shown is indicative used for facing arrangement only.
5. Markings should include a centre line, edge lines and advance signing as per the hazard warning tier system shown below.

HAZARD SEVERITY	BEND/JUNCTION SIGN ARRANGEMENT
Tier 1	Hazard signs provided as a pair on both verges
Tier 2	Yellow or grey backing plate added
Tier 3	'Reduce speed now' plate added

7. Tier 1 signing arrangement should be used as default with tier 2 used with hazards where greater care is required. Tier 3 hazard signage should only be used for the most difficult and dangerous hazards with a clear collision history.
8. Recommendations provided in sections 6.2 and 6.7 of Options Study Report COMHA1T&W038-OS-001.
9. "Slow" markings can be provided adjacent to warning signs and Tier 2 and 3 locations. Consideration should be made for repeating these markings again at tier 3 locations.
9. Chevron signing should also be provided on the bend in accordance with chapter 4 of the Traffic Signs Manual.
10. Where visibility is reduced a double white line system should be applied inline with the criteria in chapter 5 Traffic Signs Manual.

Designed:	MG	Date:	16/01/2024
Drawn:	MV	Date:	16/01/2024
Checked:	GH	Date:	23/01/2024
Approved:	HH	Date:	09/02/2024

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Project Name
A41 Route Study

Drawing Title
Whole Route Treatment Option - Bends

Project Ref. No: COMHA1T&W038	Scale : Not to Scale @ A3
Stage: Conceptual Design	Dimensions : m

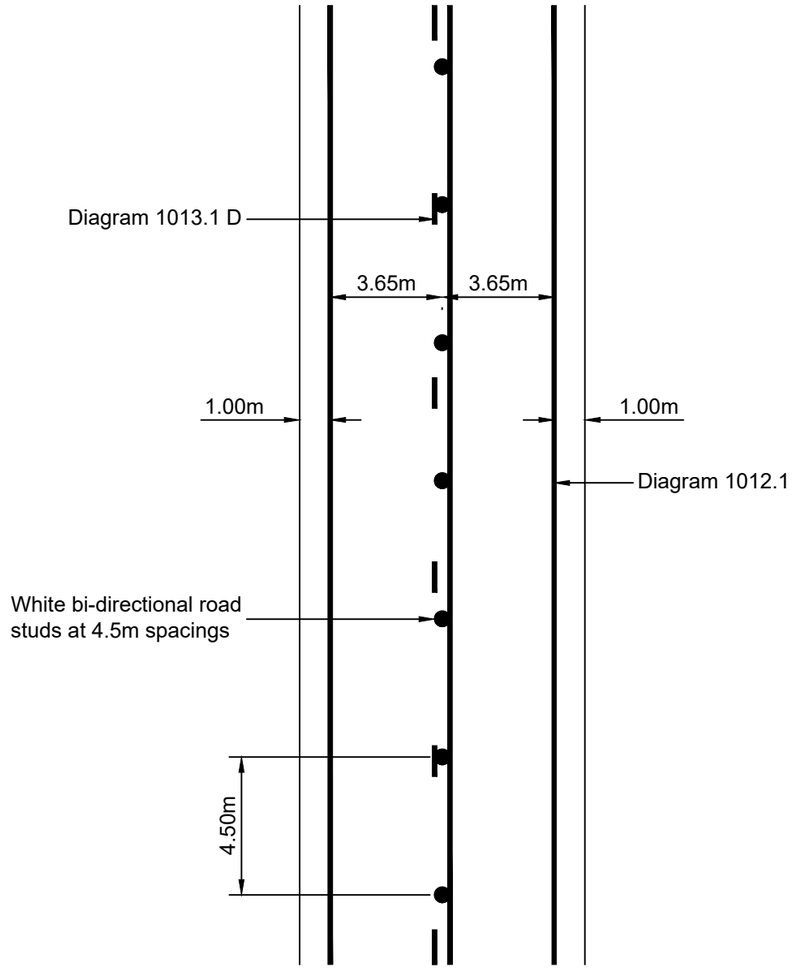
Drawing Number

Project Number	Originator	Volume
COMHA1T&W038	AMY	GEN
A41 (Location)	DR-CH (Type / Role)	0004 (Number)

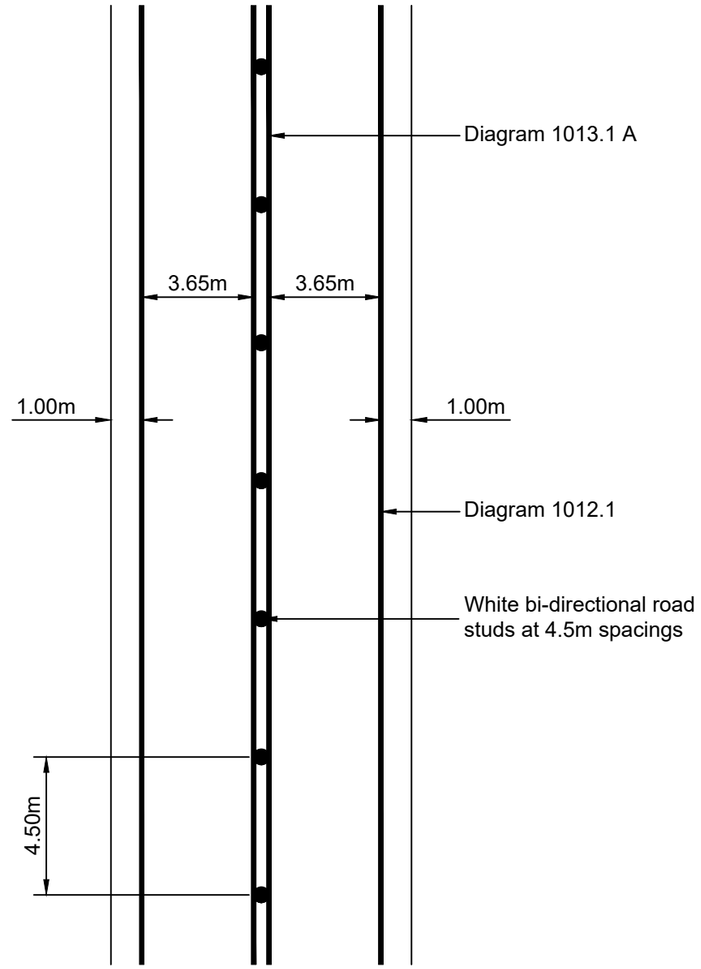
Suitability	Suitability Description	Revision
S2	Suitable For Information	P01

0 100

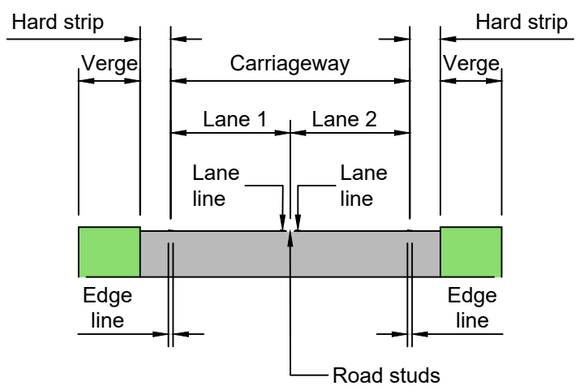
Broken Double White Lines Plan



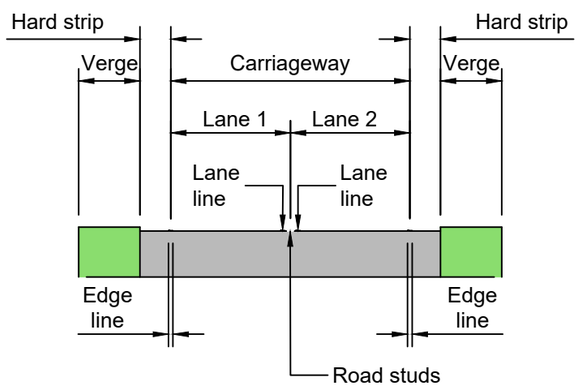
Double White Lines Plan



Broken Double White Lines Front Elevation



Double White Lines Front Elevation



General Notes

1. This drawing is for reference only and is not to be scaled.
2. All measurements shown are in METRES, unless stated otherwise and are approximate.
3. Diagrams referenced from Traffic Signs Manual Chapter 5.
4. Recommendations provided in section 6.4 of Options Study Report COMHA1T&W038-OS-001.
5. In some locations hard strip and edge line may have been omitted.
6. Bi-directional road studs at 4.5m centres as per TSM Chapter 5.
7. Diagram 1013.1 markings variants as shown below:

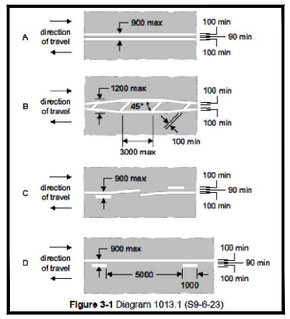


Figure 3-1 Diagram 1013.1 (S9-6-23)

8. Road markings should have a minimum performance value of R3 (150 MCD) or R4 (200 MCD) dry and RW3 wet (50 MCD) performance where enhanced performance in required. RW2 (35 MCD) should be applied at all other locations. This is in accordance with Table NA.1 in BS EN1436:2018.
9. Double white lines have been proposed for the following cluster sites relevant drawings: COMHA1T&W038-AMY-GEN-A41-DR-CH-0010, COMHA1T&W038-AMY-GEN-A41-DR-CH-0014, COMHA1T&W038-AMY-GEN-A41-DR-CH-0016.

Designed:	MG	Date:	16/01/2024
Drawn:	MV	Date:	16/01/2024
Checked:	GH	Date:	23/01/2024
Approved:	HH	Date:	09/02/2024

Amey
www.amey.co.uk

Working on behalf of

Telford & Wrekin COUNCIL

Project Name
A41 Route Study

Drawing Title
Whole Route Treatment Option - Double White Lines

Project Ref. No: COMHA1T&W038	Scale : Not to Scale @ A3
Stage: Conceptual Design	Dimensions : m

Drawing Number

Project Number	Originator	Volume
COMHA1T&W038	- AMY -	GEN
A41 (Location)	-DR-CH- (Type | Role)	0005 (Number)

Suitability	Suitability Description	Revision
S2	Suitable For Information	P01

0 100

Existing 7.5t prohibited sign (TSRGD ref. 622.1A) mounted on single post with supplementary plate

Proposed long vehicles and 7.5t prohibited signnmounted on single post

Shop Car Park

Existing Give way sign (TSRGD ref.612) mounted on single post

Existing give way sign (TSRGD ref. 612) mounted on single post

Proposed extension of traffic island to edge of carriageway and hatching

Existing no right turn sign (TSRGD ref. 602) mounted on single post

3.00m 3.65m 3.65m 3.00m

15.00m

6.00m 2.00m 11.00m

Section Line A-A

A41

Retaining wall structure

Pedestrian guardrail

Existing local map ADS

Existing dedicated lane sign

Services shop

Section Line A-A

Service station

10m direct taper

Splitter island

A41

Existing cycles crossing sign (TSRGD 950) mounted on single post with supplementary plate

Cycles crossing

Existing map ADS

Existing lane direction sign

General Notes

1. This drawing is for reference only and is not to be scaled.
2. All measurements shown are in METRES, unless stated otherwise and are approximate.
3. Lane widths and island dimensions are based on OS data and should be confirmed by a topographical survey.
4. Diagrams referenced from Traffic Signs Manual Chapter 5.
5. Long vehicles and with weight in excess of 7.5 tonnes should use Audley Avenue access not shown.
6. Internal routing within the retail park managed by third party.
8. This drawing shows option 1 proposed under section 8.1 of Options Study Report COMHA1T&W038-OS-001.
9. For Option 2 please see drawing COMHA1T&W038-AMY-GEN-A41-DR-CH-0009.

Key

Option 1

Tactile Paving

Sign

Bollard

Retaining Wall

Pedestrian Guardrail

Location Key

Designed:	MG	Date:	16/01/2024
Drawn:	MV/MG	Date:	16/01/2024
Checked:	GH	Date:	23/01/2024
Approved:	HH	Date:	09/02/2024

Amey
www.amey.co.uk

Working on behalf of

Telford & Wrekin COUNCIL

Project Name
A41 Route Study

Drawing Title
Newport Bypass Junction Option 1 - Amended splitter island and long vehicles prohibition.

Project Ref. No: COMHA1T&W038	Scale : Not to Scale @ A1
Stage: Conceptual Design	Dimensions : m

Drawing Number

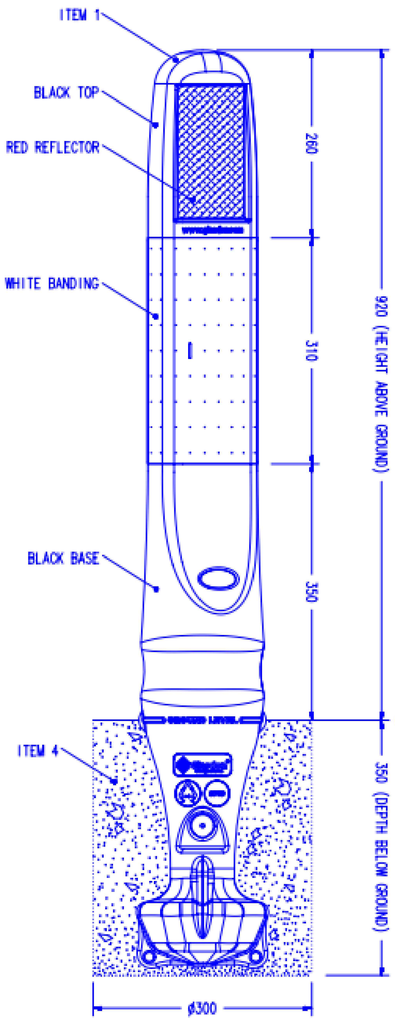
Project Number	Originator	Volume
COMHA1T&W038	AMY	GEN

Location	Type	Role	Number
A41	DR	CH	0006

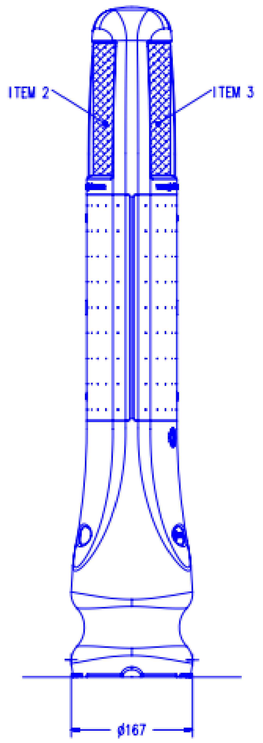
Suitability	Suitability Description	Revision
S2	Suitable For Information	P01

0 100

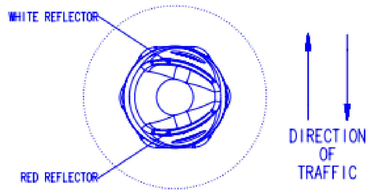
MODEL SPECIFICATION
®VERGEMASTER RX - EXTENDED BASE TYPE



FRONT VIEW (NEAR SIDE)



SIDE VIEW



PLAN VIEW (NEAR SIDE)

PRODUCT INFORMATION:

- WEIGHT - 1.8 Kg
- MATERIAL - Reflexapol
- COLOURS - Black Post®, White Band & Retro-reflector (See colour options)
- DIMENSIONS - All dimension in mm unless otherwise stated
- ITEM 1 - Vergemaster RX (Extended Base Type) c/w Band and Reflectors
- ITEM 2 - S/A Reflective - Class R2 (Red)
- ITEM 3 - S/A Reflective - Class R2 (White)
- ITEM 4 - Quick Setting Concrete (e.g. Grade QC10), or suitable Subsoil - fully compacted.

TECHNICAL REFERENCE:

- Conforms with the requirements of 'The Statutory Instruments No. 3113 - The Traffic Signs Regulations & General Directions 2002 (TSRGD) - Sign 561.'
- Complies with the 'Department for Transport Traffic Signs Manual, Chapter 4, Warning Signs, 2013.
- The Retro-reflectors Surface Area is in accordance with the stated requirements of sign 561 in TSRGD.
- Type R1 Retro-reflectors are available to class RA2 or class 3 as defined in EN 12899-3-2007

INSTALLATION GUIDE:

- Extended Base Type (See Drawing 02SO67-SO2 for Vergemaster RX Stake Type)
- Extended wide base ensures a secure location.
- A tapered base section assists backfill and gives added impact resistance.
- --Extended Base Type to be positioned in orientation shown in front view, to ensure Vergemaster RX is positioned correctly.
- Ensure Reflectors are positioned in correct orientation. Red Reflector faces oncoming traffic on the near-side. White Reflector faces oncoming traffic on the off-side. Amber Retro-reflector faces oncoming traffic on the off-side of dual carriageways.
- Recommended hole size ø300mm x 350mm deep.

General Notes

1. This drawing is for reference only and is not to be scaled.
2. All measurements shown are in MILLIMETRES, unless stated otherwise and are approximate.
3. Diagrams referenced from Glasdon website.
4. Detail given is for Glasdon Vergemaster RX marker post. Other mark posts meeting the same specification are available.
5. Not for bollard details, please refer to drawing COMHA1T&W038-AMY-GEN-A41-DR-CH-0008.
6. Marker post arrangements have been proposed for the following cluster sites relevant drawings: COMHA1T&W038-AMY-GEN-A41-DR-CH-0010, COMHA1T&W038-AMY-GEN-A41-DR-CH-0011, COMHA1T&W038-AMY-GEN-A41-DR-CH-0013, COMHA1T&W038-AMY-GEN-A41-DR-CH-0014, COMHA1T&W038-AMY-GEN-A41-DR-CH-0015, COMHA1T&W038-AMY-GEN-A41-DR-CH-0019.

Designed:	MG	Date:	16/01/2024
Drawn:	MG	Date:	16/01/2024
Checked:	GH	Date:	23/01/2024
Approved:	HH	Date:	09/02/2024

Amey

www.amey.co.uk

Working on behalf of

Telford & Wrekin COUNCIL

Project Name
A41 Route Study

Drawing Title
Verge Marker Post Typical Detail

Project Ref. No: COMHA1T&W038	Scale : Not to Scale @ A1
Stage: Conceptual Design	Dimensions : mm

Drawing Number

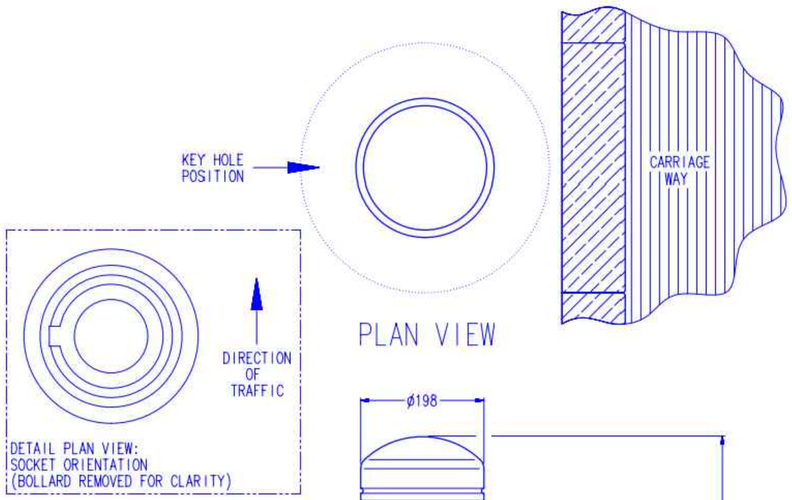
Project Number	Originator	Volume
COMHA1T&W038	- AMY -	GEN

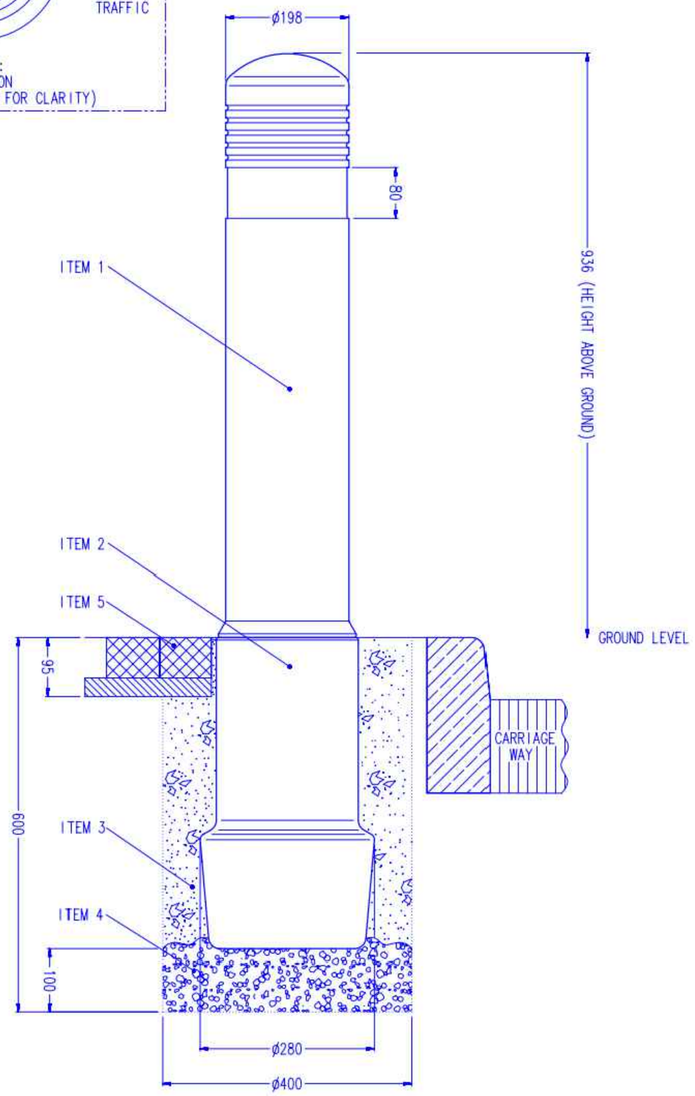
Location	Type	Role	Number
A41	-DR-CH-		0007

Suitability	Suitability Description	Revision
S2	Suitable For Information	P01

0 100

MODEL SPECIFICATION
ADMIRAL™ BOLLARD - SOCKETED





FRONT VIEW

PRODUCT INFORMATION:

- WEIGHT - BOLLARD 5.1 Kg
  SOCKET 3.8 Kg
  TOTAL 8.9 Kg
- MATERIAL - DURAPOL®
- COLOURS - MILLSTONE, SANDSTONE, WHITE, BLACK, GREY AND STONE.
- DIMENSIONS - ALL DIMENSIONS IN MM UNLESS OTHERWISE STATED.

INSTALLATION GUIDE:

- ITEM 1 - REMOVABLE BOLLARD COMPLETE WITH LOCKING MECHANISM
- ITEM 2 - PERMANENT GROUND SOCKET
- ITEM 3 - QUICK SETTING CONCRETE (eg. GRADE QC10)
- ITEM 4 - GRAVEL
- ITEM 5 - BLOCK PAVING
- FOR SAFETY SITE KEY HOLE ON OPPOSITE SIDE TO TRAFFIC (SEE DETAIL PLAN VIEW FOR CORRECT SOCKET ORIENTATION).
- ENSURE REFLECTIVE BANDING IS IN THE CORRECT ORIENTATION - RED TOWARDS ONCOMING TRAFFIC (YELLOW ON CENTRAL RESERVATION).
- RECOMMENDED HOLE SIZE ø400mm x 600mm DEEP.
- WE RECOMMEND THE SOCKET IS BEDDED ON GRAVEL FOR DRAINAGE.
- COVER SOCKET TO AVOID BUILD UP OF CONCRETE/GRAVEL IN SOCKET, WHICH WILL PREVENT BOLLARD FROM SEATING AND LOCKING.
- AVOID CONTACT WITH HOT TARMACADAM AS THIS WILL SERIOUSLY IMPAIR THE PERFORMANCE OF THE BOLLARD.
- WE RECOMMEND INSTALLING WITH QUICK SETTING CONCRETE (eg. GRADE QC10) BUT EXACT INSTALLATION REQUIREMENTS SHOULD BE ASSESSED FROM A SITE SURVEY.

OPTIONAL PARTS:

- PEDESTRIAN SAFETY. A LOCKING BLANKING CAP IS AVAILABLE TO COVER THE SOCKET WHEN THE BOLLARD IS REMOVED.
- ADDITIONAL SECURITY. A KEY HOLE PLUG MAY BE FITTED TO THE BOLLARD TO HELP PREVENT UNAUTHORISED REMOVAL OF THE BOLLARD.
- ALUMINIUM BACKED RETROREFLECTIVE BANDING (TO BS EN 12899-1:2007, FIXED, VERTICAL ROAD TRAFFIC SIGNS) OR DECORATIVE BANDING MAY BE FITTED.
- STANDARD BANDING SETS:
  1 x 80mm BAND.
- STANDARD OR SPIKED CHAIN LINKAGE IS AVAILABLE. RECOMMENDED PITCH BETWEEN BOLLARDS 1.1m.
- SPARE BOLLARDS, SOCKETS, KEYS AND BANDING ARE AVAILABLE.
- ALL RETOREFLECTIVE MATERIALS SUPPLIED BY GLASDON ARE AS RECOMMENDED IN TABLE NA1 OF THE NATIONAL ANNEX OF BS EN 12899-1 2007 FIXED VERTICAL ROAD SIGNS.

General Notes

1. This drawing is for reference only and is not to be scaled.
2. All measurements shown are in MILLIMETRES, unless stated otherwise and are approximate.
3. Diagrams referenced from Glasdon website.
4. Detail given is for Glasdon Admiral Bollard. Other bollards meeting the same specification are available.
5. Note for verge marker post details, please refer to drawing COMHA1T&W038-AMY-GEN-A41-DR-CH-0007.
6. For recommended bollard locations please refer to drawing COMHA1T&W038-AMY-GEN-A41-DR-CH-0002.

Designed:	MG	Date:	24/01/2024
Drawn:	MG	Date:	24/01/2024
Checked:	GH	Date:	09/02/2024
Approved:	HH	Date:	09/02/2024

Amey
www.amey.co.uk

Working on behalf of
Telford & Wrekin COUNCIL

Project Name
A41 Route Study

Drawing Title
Bollard Typical Detail

Project Ref. No: COMHA1T&W038	Scale : Not to Scale @ A1
Stage: Conceptual Design	Dimensions : mm

Drawing Number

Project Number	Originator	Volume
COMHA1T&W038	AMY	GEN
A41 (Location)	DR-CH- (Type | Role)	0008 (Number)

Suitability	Suitability Description	Revision
S2	Suitable For Information	P01

0 100

Shop Car Park

Existing 7.5t prohibited sign (TSRGD ref. 622.1A) mounted on single post with supplementary plate

Supplementary plate removed

Existing Give way sign (TSRGD ref.612) mounted on single post

Island could be extended to reduce turning length which currently exceeds that specified in CD123.

3.00m 3.65m 3.65m 3.00m

15.00m

6.00m 2.00m 11.00m

Proposed long vehicles and 7.5t prohibited signs mounted on single post

Existing give way sign (TSRGD ref. 612) mounted on single post

Existing no right turn sign (TSRGD ref. 602) mounted on single post

Section Line A-A

A41

Retaining wall structure

Pedestrian guardrail

Existing local map ADS

Existing dedicated lane sign

Proposed extension of traffic island

Services shop

Section Line A-A

Service station

Proposed extension of spitter island to edge of carriageway with a 1.5m wide extension along edge of the centre lane. This requires adjustments to the lane widths for the through lane and right turn.

10m direct taper

Splitter island

A41

Existing cycles crossing sign (TSRGD 950) mounted on single post with supplementary plate

Cycles crossing

Existing map ADS

Existing lane direction sign

General Notes

1. This drawing is for reference only and is not to be scaled.
2. All measurements shown are in METRES, unless stated otherwise and are approximate.
3. Lane widths and island dimensions are based on OS data and should be confirmed by a topographical survey.
4. Diagrams referenced from Traffic Signs Manual Chapter 5
5. Under option 2 the southern splitter island is likely to require extension north along central lane to reduce length of central reserve opening as per DMRB CD123, 6.16.
6. Centre lane width cane be reduced to 2.5m as per DMRB CD123, 6.10.
7. Long vehicles and with weight in excess of 7.5 tonnes should use Audley Avenue access not shown.
8. Internal routing within the retail park managed by third party.
9. This drawing shows option 2 proposed under section 8.1 of Options Study Report COMHA1T&W038-OS-001.
10. For Option 1 please see drawing COMHA1T&W038-AMY-GEN-A41-DR-CH-0006.

Key

Option 2

Tactile Paving

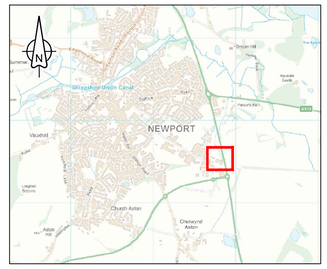
Sign

Bollard

Retaining Wall

Pedestrian Guardrail

Location Key



Designed:	MG	Date:	16/01/2024
Drawn:	MV/MG	Date:	30/01/2024
Checked:	GH	Date:	08/02/2024
Approved:	HH	Date:	09/02/2024

Amey
www.amey.co.uk

Working on behalf of

Telford & Wrekin COUNCIL

Project Name
A41 Route Study

Drawing Title
Newport Bypass Junction Option 2 - Single Lane Dualing

Project Ref. No: COMHA1T&W038	Scale : Not to Scale @ A1
Stage: Conceptual Design	Dimensions : m

Drawing Number

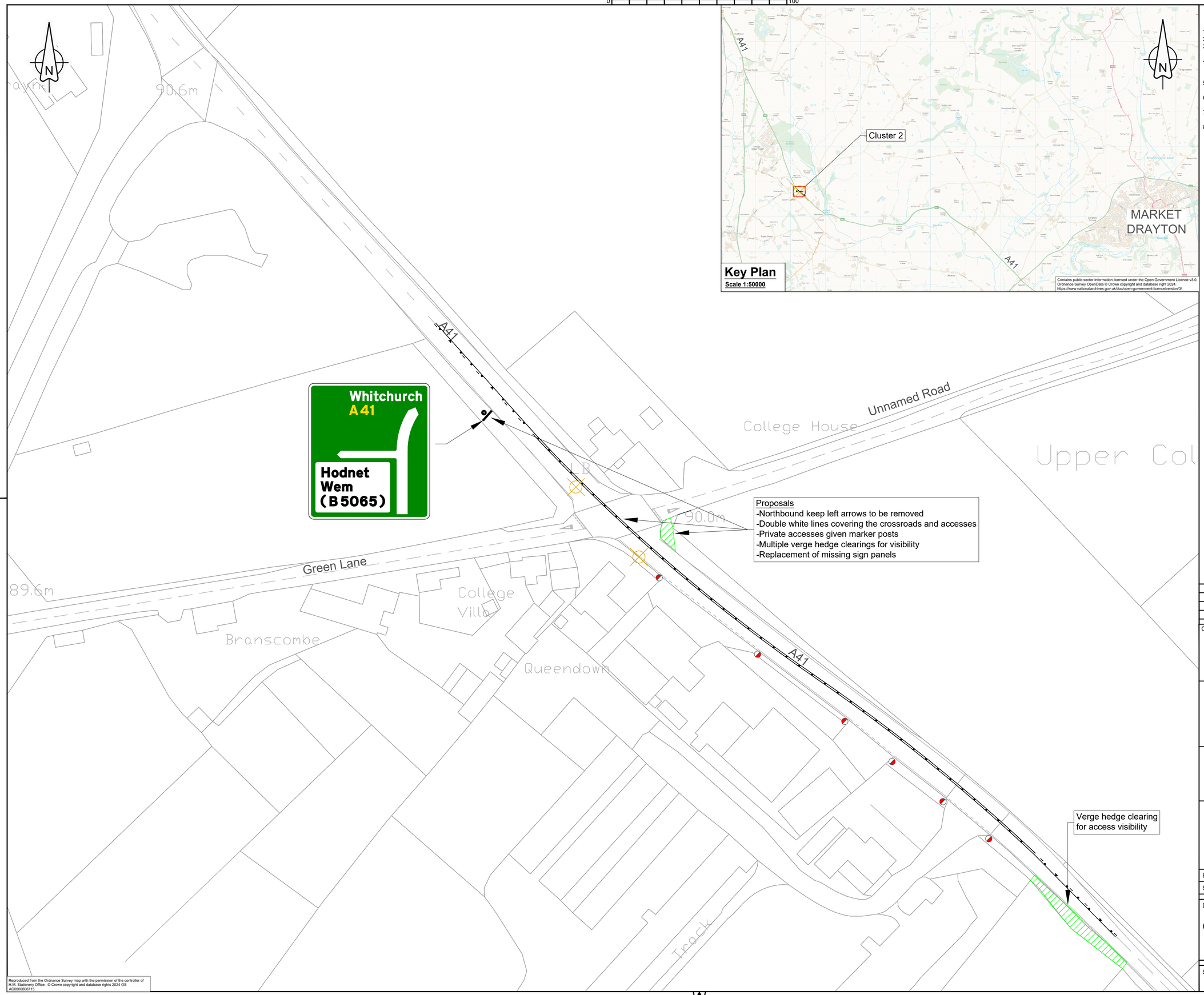
Project Number		Originator		Volume
COMHA1T&W038	-	AMY	-	GEN

Location		Type	Role	Number
A41	-	DR	CH	0009

Suitability	Suitability Description	Revision
S2	Suitable For Information	P01

0 100

Key Plan
Scale 1:50000



Proposals
-Northbound keep left arrows to be removed
-Double white lines covering the crossroads and accesses
-Private accesses given marker posts
-Multiple verge hedge clearings for visibility
-Replacement of missing sign panels

General Notes

1. DRAWINGS TO BE PRINTED IN COLOUR.
2. This drawing is for reference only and is not to be scaled.
3. All measurements shown are in METRES, unless stated otherwise and are approximate.
4. Proposed double white lines are shown indicatively, consideration for minimum visibility distance of 150m should be made as per TSM Chapter 5.
5. Proposed double white lines as per arrangement given in drawing COMHA1T&W038-AMY-GEN-A41-DR-CH-0005.
6. Marker posts arrangement for private accesses given in drawing COMHA1T&W038-AMY-GEN-A41-DR-CH-0002.
7. This drawing shows recommendations proposed under section 7.1 of Options Study Report COMHA1T&W038-OS-001.
8. Proposed sign replacement shown is indicative and based on existing sign. Replacements should be designed and checked to TSRGD.

Key

Collision Severity

Serious

Verge hedge clearing

Proposed marker post

Sign

Designed:	MG	Date: 16/01/2024
Drawn:	MV/MG	Date: 16/01/2024
Checked:	GH	Date: 23/01/2024
Approved:	HH	Date: 09/02/2024

Amey
www.amey.co.uk

Working on behalf of
Telford & Wrekin COUNCIL

Project Name
A41 Route Study

Drawing Title
Proposed Options Plan
Cluster Site 2 - Green Lane Crossroads

Project Ref. No: COMHA1T&W038	Scale : 1:500 @ A1
Stage: Conceptual Design	Dimensions : m

Drawing Number

Project Number	Originator	Volume	Location	Type	Role	Number
COMHA1T&W038	AMY	GEN	A41	DR	CH	0010

Suitability	Suitability Description	Revision
S2	Suitable For Information	P01

0 100

Proposed refresh of side road markings

Proposals
- Correction of chevron sign backing boards.
- Replaced tactile paving and raising of refuge kerbing.

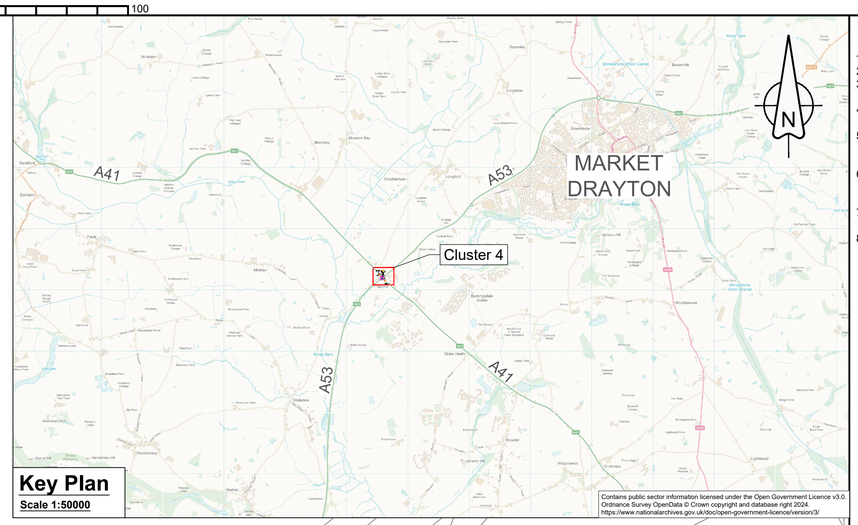
Considerations
- Remove existing refuges and move pedestrian crossings further out.
- Replacement of roundabout with signalised crossroads

Proposed access marker posts

Verge hedge clearing for obscured sign

Proposed access marker posts

Ashcroft
ROMAN ROAD
A41 Roman Road
Ternhill
Sitlington
A53
WB
Green Bank Farm
Slurry Bed
Holly Barn
Willow Barn
Willow House
Tern Hill House
MS
Holly Croft



Key Plan
Scale 1:50000

General Notes

1. DRAWINGS TO BE PRINTED IN COLOUR.
2. This drawing is for reference only and is not to be scaled.
3. All measurements shown are in METRES, unless stated otherwise and are approximate.
4. Marker posts arrangement for private accesses given in drawing COMHA1T&W038-AMY-GEN-A41-DR-CH-0002.
5. Design and arrangement of pedestrian crossings not shown and would be subject to full pedestrian assessment in accordance with TSM Chapter 6.
6. Proposed raised refuge kerbs and replacement tactile paving subject to review of the requirements of large vehicles and those with abnormal loads.
7. Sign faces shown are indicative proposals and replacements should be designed and checked to TSRGD.
8. This drawing shows recommendations proposed under section 7.2 of Options Study Report COMHA1T&W038-OS-001.

Key

Collision Severity

Slight

Existing sign

Proposed Marker post

Verge clearing

Proposed areas for tactile paving replacement

Suggested alternative pedestrian crossing locations

Designed:	MG	Date:	16/01/2024
Drawn:	MV/MG	Date:	16/01/2024
Checked:	GH	Date:	23/01/2024
Approved:	HH	Date:	09/02/2024

Amey
www.amey.co.uk

Working on behalf of
Telford & Wrekin COUNCIL

Project Name
A41 Route Study

Drawing Title
Proposed Options Plan
Cluster Site 4 - Ternhill Roundabout

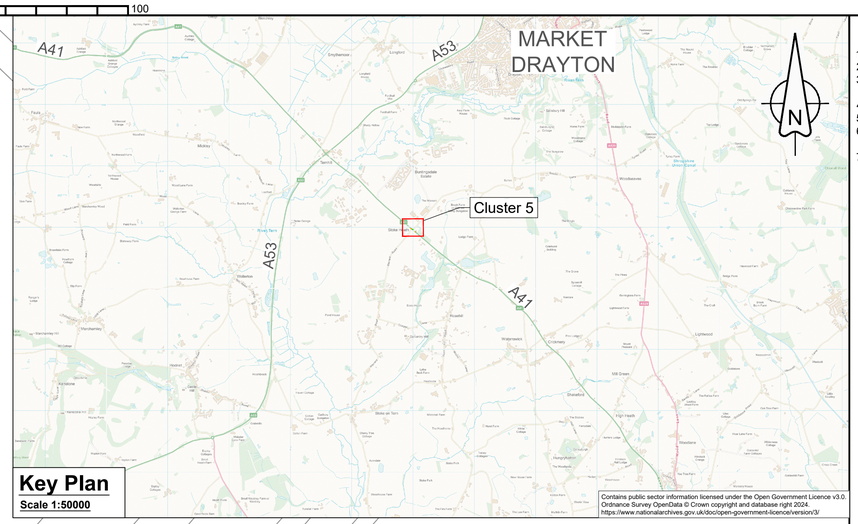
Project Ref. No: COMHA1T&W038	Scale : 1:500 @ A1
Stage: Conceptual Design	Dimensions : m

Drawing Number

Project Number	Originator	Volume
COMHA1T&W038	AMY	GEN
A41 (Location)	DR-CH- (Type | Role)	0011 (Number)

Suitability	Suitability Description	Revision
S2	Suitable For Information	P01

0 100



Key Plan
Scale 1:50000

General Notes

1. DRAWINGS TO BE PRINTED IN COLOUR.
2. This drawing is for reference only and is not to be scaled.
3. All measurements shown are in METRES, unless stated otherwise and are approximate.
4. Proposed low-flying helicopter sign to be sited as per TSM Chapter 4.
5. Replacement bollards to be self righting retro-reflective.
6. Sign faces shown are indicative proposals and replacements should be designed and checked to TSRGD.
7. This drawing shows recommendations proposed under section 7.3 of Options Study Report COMHA1T&W038-OS-001.

Key

Collision Severity

Serious

Slight

Verge Clearing

Proposed Sign

Existing Bollard

Verge clearing for obscured sign

A41

Sutton Road

Mast (Telecommunication)

Proposals
-Refresh of junction markings
-Bollards cleaned or replaced
Considerations
-Narrow minor road exits or reduce corner radii
-Reposition traffic islands to give way lines

Warrant Road

Stone

Warrant Farm Bungalow

MS

A41

Southbound verge cut back

Verge hedge clearing for obscured ADS

For ½ mile

Proposed helicopter hazard sign

Designed:	MG	Date:	16/01/2024
Drawn:	MV	Date:	16/01/2024
Checked:	GH	Date:	23/01/2024
Approved:	HH	Date:	09/02/2024

Amey
www.amey.co.uk

Working on behalf of
Telford & Wrekin COUNCIL

Project Name
A41 Route Study

Drawing Title
Proposed Options Plan
Cluster Site 5 - Warrant Road

Project Ref. No: COMHA1T&W038	Scale : 1:500 @ A1
Stage: Conceptual Design	Dimensions : m

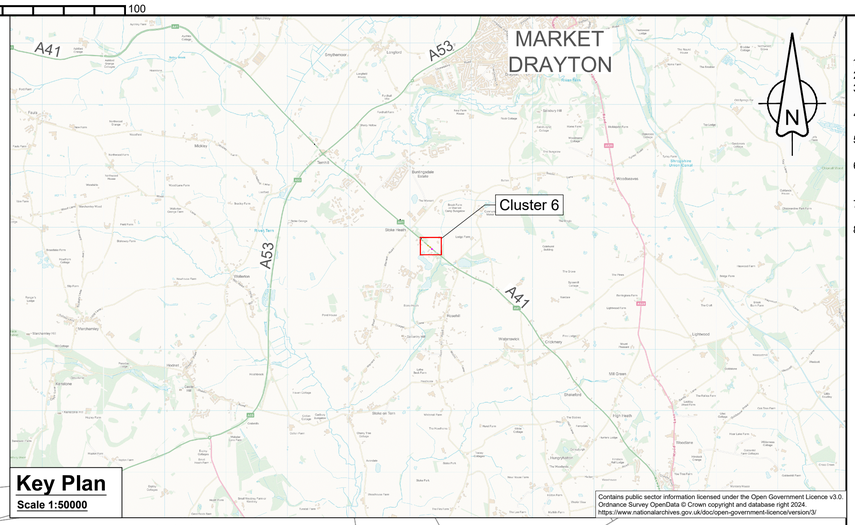
Drawing Number

Project Number	Originator	Volume
COMHA1T&W038	AMY	GEN

Location	Type	Role	Number
A41	DR	CH	0012

Suitability	Suitability Description	Revision
S2	Suitable For Information	P01

0 100



Key Plan
Scale 1:50000

Southbound verge to be cleared and edge lines to be reinstated and defined

Proposed access marker posts

Proposals
-Raised footway installed between junction and access with dropped kerbs and tactile paving
-Junction give way lines moved forward for visibility
Considerations
-One-way entrance and exit system for shop
-Closure of non-standard lay-by

Proposed access marker posts

Slippery road sign to be reviewed and removed or given passive base

Track
Track
83.2m
Dunroamin
Halfway House
East View
Heath House
A41
The Longford
ROMAN ROAD

General Notes

1. DRAWINGS TO BE PRINTED IN COLOUR.
2. This drawing is for reference only and is not to be scaled.
3. All measurements shown are in METRES, unless stated otherwise and are approximate.
4. Sign faces shown are indicative proposals and replacements should be designed and checked to TSRGD.
5. Marker posts arrangement for private accesses provided in drawing COMHA1T&W038-AMY-GEN-A41-DR-CH-0002.
6. Proposed give way line arrangement for corrected junctions provided in drawing COMHA1T&W038-AMY-GEN-A41-DR-CH-0003.
7. Proposed dropped kerb and tactile paving for raised footway not shown.
8. This drawing shows recommendations proposed under section 7.4 of Options Study Report COMHA1T&W038-OS-001.

Key

Collision Severity

Serious

Verge clearing

Proposed marker post

Proposed kerb line

Sign

Designed:	MG	Date:	16/01/2024
Drawn:	MV	Date:	16/01/2024
Checked:	GH	Date:	23/01/2024
Approved:	HH	Date:	09/02/2024

Amey
www.amey.co.uk

Working on behalf of
Telford & Wrekin COUNCIL

Project Name
A41 Route Study

Drawing Title
Proposed Options Plan
Cluster Site 6 - Newcott Fish & Chips

Project Ref. No: COMHA1T&W038	Scale : 1:500 @ A1
Stage: Conceptual Design	Dimensions : m

Drawing Number

Project Number	Originator	Volume
COMHA1T&W038	AMY	GEN

Location	Type	Role	Number
A41	DR	CH	0013

Suitability	Suitability Description	Revision
S2	Suitable For Information	P01

0 100

Rosehill

Verge clearing for obscured sign

Expanded double white lines

Existing sign arrangement

Verge corner hedges and trees to be removed for visibility

Proposals
-Additional hazard sign for southbound offside
-Corrected chevron sign layout and additional sign per direction
-Marker posts for access
-Extended double white lines

Suggested mirror locations for consideration

Milestone Bungalow

94.8m

Field access that tracks mud and suggested hard standing

Proposed replacement Rosehill sign

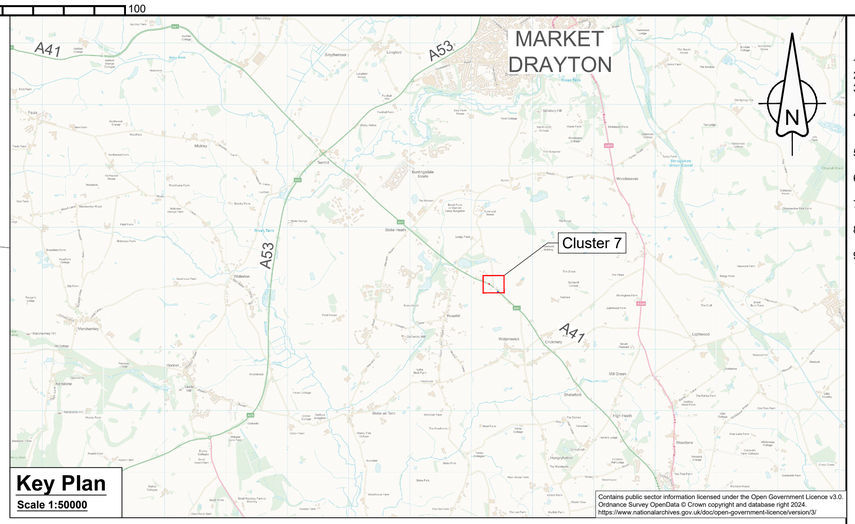
ROSEHILL
Please drive carefully

REDUCE SPEED NOW

A41

Bdy

CR



Key Plan
Scale 1:50000

General Notes

1. DRAWINGS TO BE PRINTED IN COLOUR.
2. This drawing is for reference only and is not to be scaled.
3. All measurements shown are in METRES, unless stated otherwise and are approximate.
4. Proposed extension of double white lines is shown indicatively, consideration for minimum visibility distance of 150m should be made as per TSM Chapter 5.
5. Proposed double white lines as per arrangement given in COMHA1T&W038-AMY-GEN-A41-DR-CH-0005.
6. Marker posts arrangement for private accesses given in drawing COMHA1T&W038-AMY-GEN-A41-DR-CH-0002.
7. Sign faces shown are indicative proposals and replacements should be designed and checked to TSRGD.
8. Mirror locations shown are suggestions and installation would be subject to application via Shropshire County Council.
9. This drawing shows recommendations proposed under section 7.5 of Options Study Report COMHA1T&W038-OS-001.

Key

Collision Severity

Fatal

Serious

Proposed sign

Existing sign

Verge clearing

Proposed marker Post

Proposed mirrors

Proposed hard standing

Designed:	MG	Date:	16/01/2024
Drawn:	MV	Date:	16/01/2024
Checked:	GH	Date:	23/01/2024
Approved:	HH	Date:	09/02/2024

Amey
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Working on behalf of
Telford & Wrekin COUNCIL

Project Name
A41 Route Study

Drawing Title
Proposed Options Plan
Cluster Site 7 - Blooming Barkers

Project Ref. No: COMHA1T&W038	Scale : 1:500 @ A1
Stage: Conceptual Design	Dimensions : m

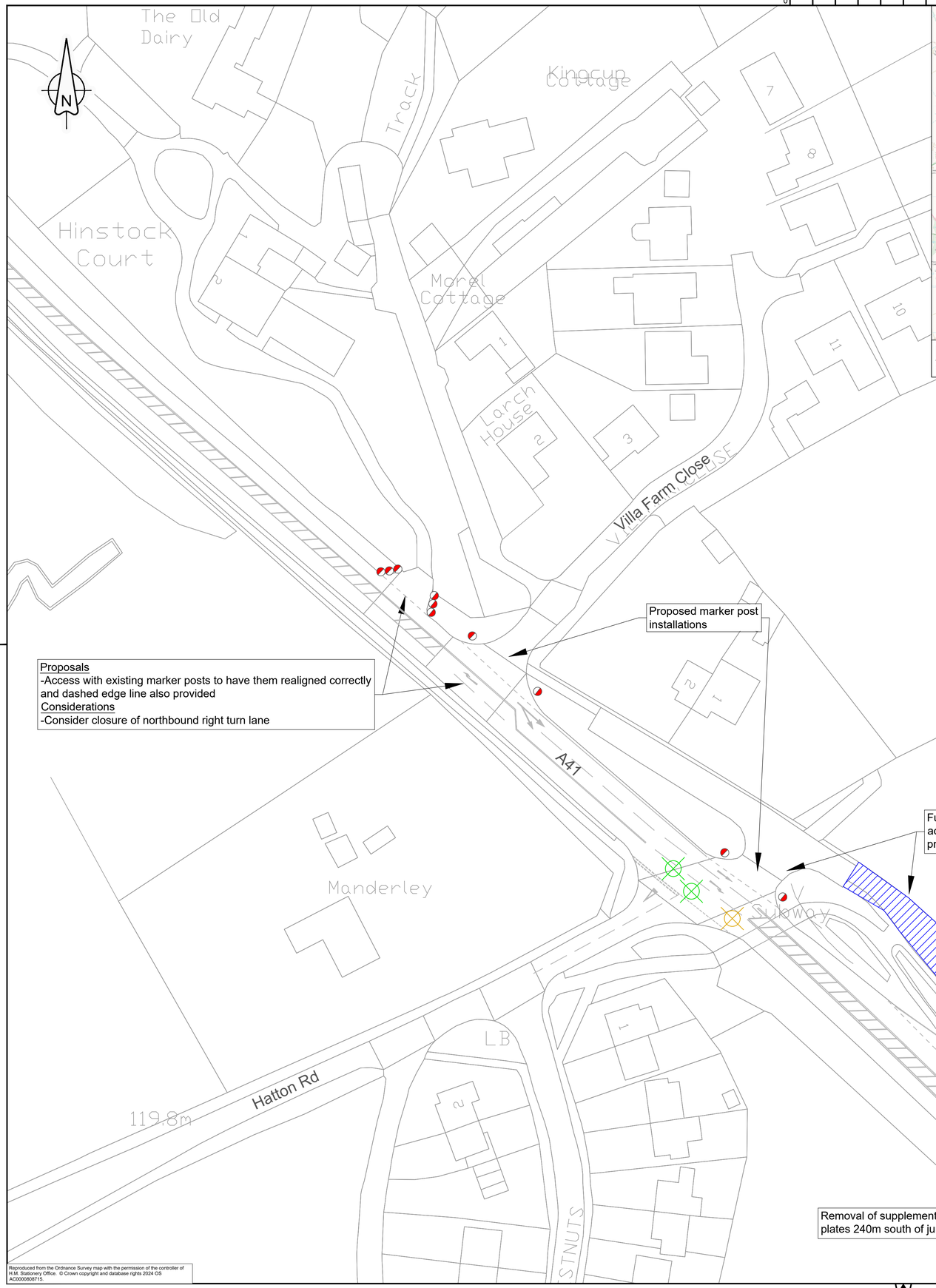
Drawing Number

Project Number	Originator	Volume
COMHA1T&W038	AMY	GEN

Location	Type	Role	Number
A41	DR	CH	0014

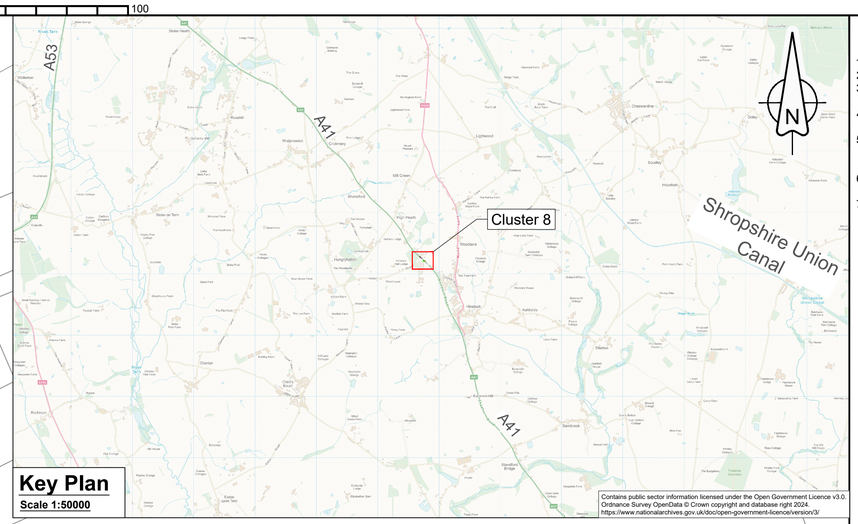
Suitability	Suitability Description	Revision
S2	Suitable For Information	P01

0 100



Key Plan

Scale 1:50000



General Notes

1. DRAWINGS TO BE PRINTED IN COLOUR.
2. This drawing is for reference only and is not to be scaled.
3. All measurements shown are in METRES, unless stated otherwise and are approximate.
4. Recommended removal of crawler notation plates outside drawing extents, not found in TSRGD.
5. If northbound right turn lane is to be kept then new signing prohibiting right turns for long or wide vehicles should be provided as per TSM Chapter 3.
6. Marker posts arrangement for private accesses given in drawing COMHA1T&W038-AMY-GEN-A41-DR-CH-0002.
7. This drawing shows recommendations proposed under section 7.6 of Options Study Report COMHA1T&W038-OS-001.

Key

Collision Severity

Serious

Slight

Proposed marker post

Potential future re-instatement of road

Designed:	MG	Date: 16/01/2024
Drawn:	MV	Date: 16/01/2024
Checked:	GH	Date: 23/01/2024
Approved:	HH	Date: 09/02/2024

Amey

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Working on behalf of

Telford & Wrekin COUNCIL

Project Name

A41 Route Study

Drawing Title

Proposed Options Plan
Cluster Site 8 - Hatton Road Junction

Project Ref. No: COMHA1T&W038	Scale : 1:500 @ A1
Stage: Conceptual Design	Dimensions : m

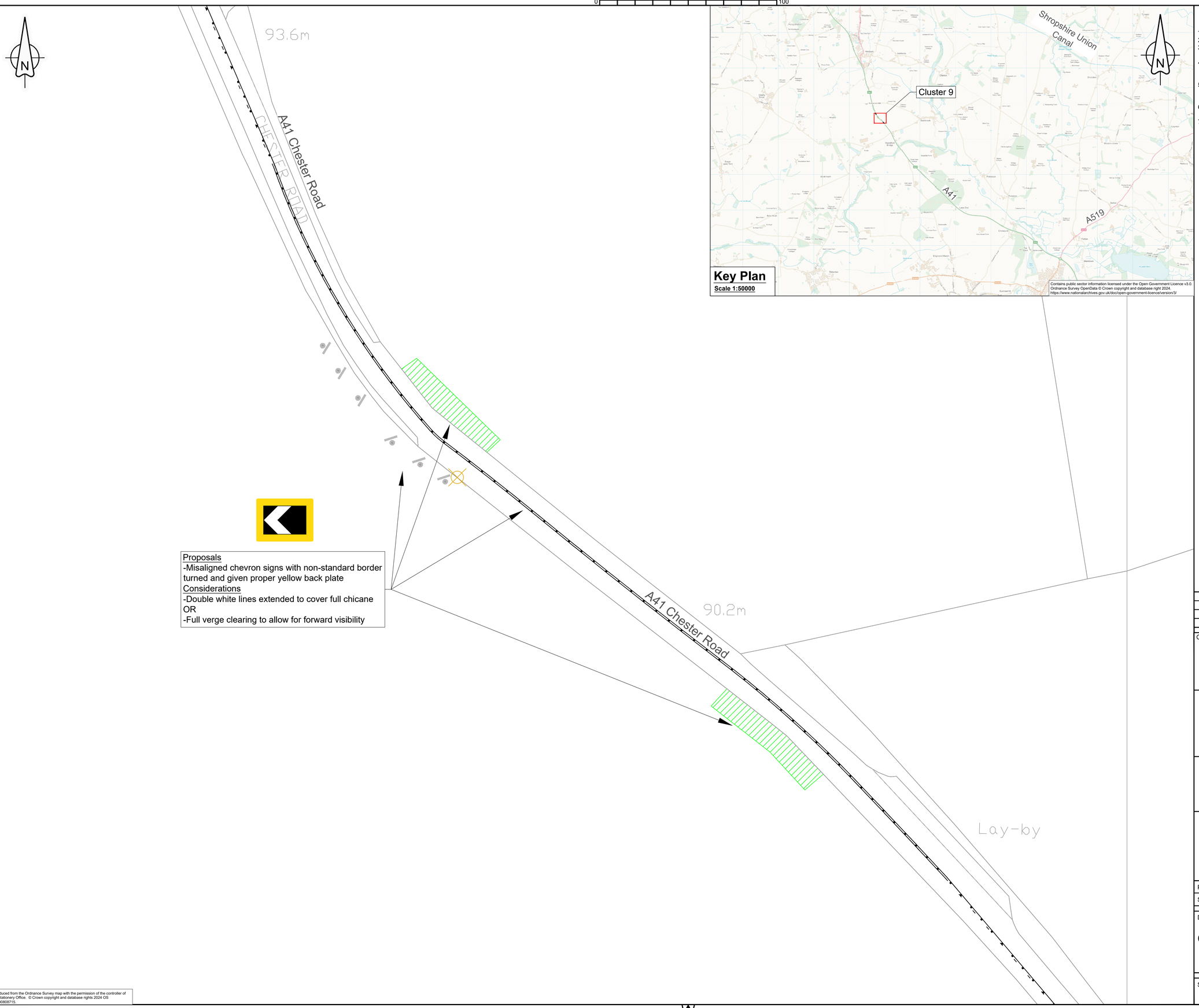
Drawing Number

Project Number	Originator	Volume
COMHA1T&W038	AMY	GEN

Location	Type	Role	Number
A41	DR	CH	0015

Suitability	Suitability Description	Revision
S2	Suitable For Information	P01

0 100



Proposals
-Misaligned chevron signs with non-standard border turned and given proper yellow back plate
Considerations
-Double white lines extended to cover full chicane OR
-Full verge clearing to allow for forward visibility

Key Plan
Scale 1:50000

General Notes

1. DRAWINGS TO BE PRINTED IN COLOUR.
2. This drawing is for reference only and is not to be scaled.
3. All measurements shown are in METRES, unless stated otherwise and are approximate.
4. Proposed extension of double white lines is shown indicatively, consideration for minimum visibility distance of 95m should be made as per TSM Chapter 5.
5. Proposed double white lines as per arrangement given in COMHA1T&W038-AMY-GEN-A41-DR-CH-0005 and section 6.4 of Options Study Report COMHA1T&W038-OS-001.
6. This drawing shows recommendations proposed under section 7.7 of Options Study Report COMHA1T&W038-OS-001.
7. Sign faces shown are indicative proposals and replacements should be designed and checked to TSRGD.

Key

Collision Severity

Serious

Verge clearing

Existing sign

Designed:	MG	Date:	16/01/2024
Drawn:	MV	Date:	16/01/2024
Checked:	GH	Date:	23/01/2024
Approved:	HH	Date:	09/04/2024

Amey
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Working on behalf of
Telford & Wrekin COUNCIL

Project Name
A41 Route Study

Drawing Title
Proposed Options Plan
Cluster Site 9 - 600m North of Standford Service Station

Project Ref. No: COMHA1T&W038	Scale : 1:500 @ A1
Stage: Conceptual Design	Dimensions : m

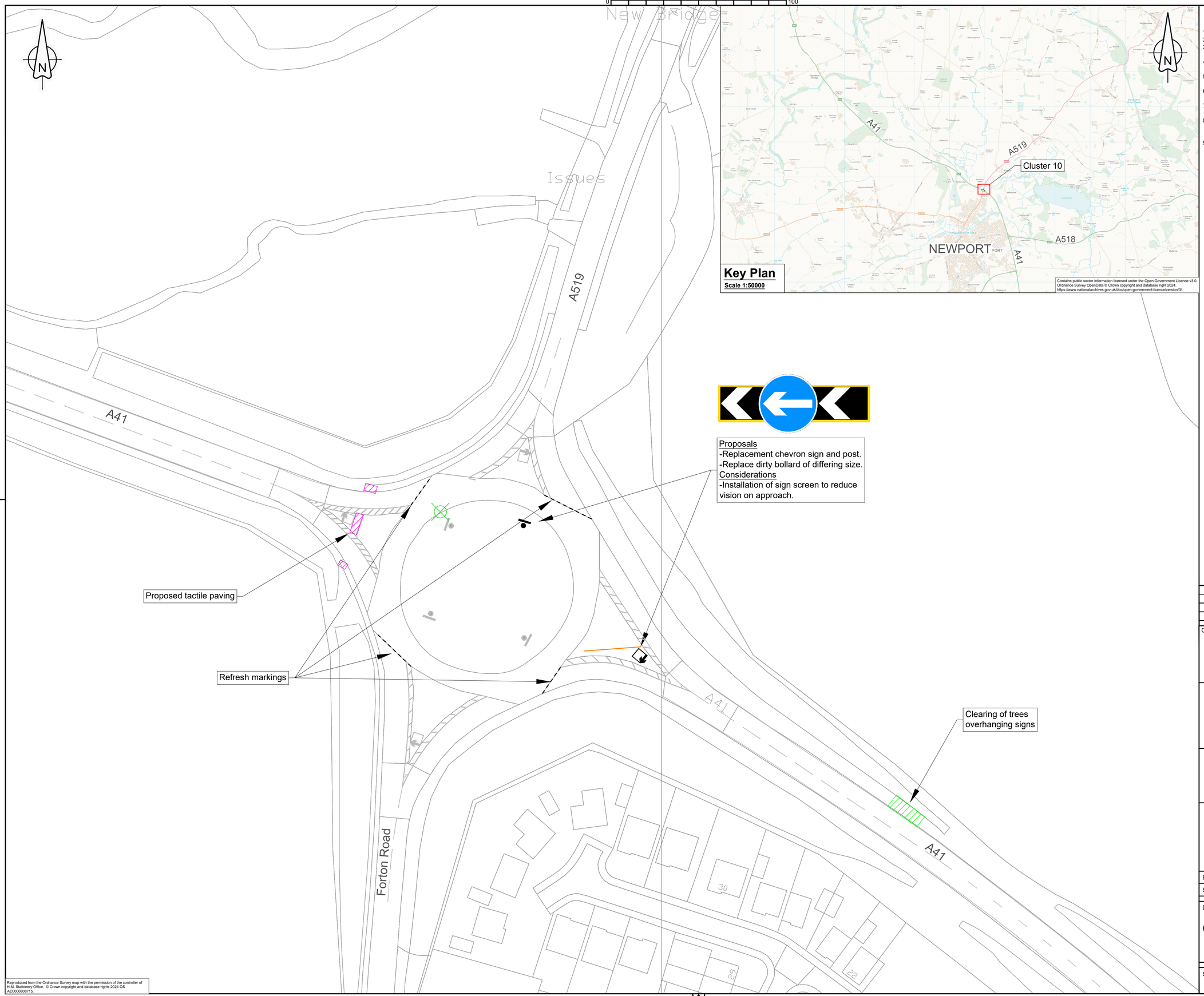
Drawing Number

Project Number	Originator	Volume
COMHA1T&W038	AMY	GEN

Location	Type	Role	Number
A41	DR	CH	0016

Suitability	Suitability Description	Revision
S2	Suitable For Information	P01

0 100



Key Plan
Scale 1:50000

Proposals
-Replacement chevron sign and post.
-Replace dirty bollard of differing size.
Considerations
-Installation of sign screen to reduce vision on approach.

General Notes

1. DRAWINGS TO BE PRINTED IN COLOUR.
2. This drawing is for reference only and is not to be scaled.
3. All measurements shown are in METRES, unless stated otherwise and are approximate.
4. Proposed tactile paving arrangements to adhere to tactile paving guidance and inclusive mobility and TSM Chapter 6.
5. Bollards to provide regulatory signing arrangements for roundabout as per TSM Chapter 3.
6. Sign faces shown are indicative proposals and replacements should be designed and checked to TSRGD.
7. This drawing shows recommendations proposed under section 7.8 of Options Study Report COMHA1T&W038-OS-001.
8. Replacement chevron sign as per TSM Chapter 4, section 6.7 of Options Study Report COMHA1T&W038-OS-001 and drawing COMHA1T&W038-AMY-GEN-A41-DR-CH-0004.
9. Suggested screen product is Evo-Sightscreen by TMP but other products are available and should meet BS EN 12767:2019 passive safety standard.

Key

Collision Severity

Slight

Proposed Sign

Existing Sign

Proposed Bollard

Existing Bollard

Tree Clearing

Tactile Paving

Suggested screen

Designed:	MG	Date:	16/01/2024
Drawn:	MV	Date:	16/01/2024
Checked:	GH	Date:	23/01/2024
Approved:	HH	Date:	09/02/2024

Amey
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Working on behalf of
Telford & Wrekin COUNCIL

Project Name
A41 Route Study

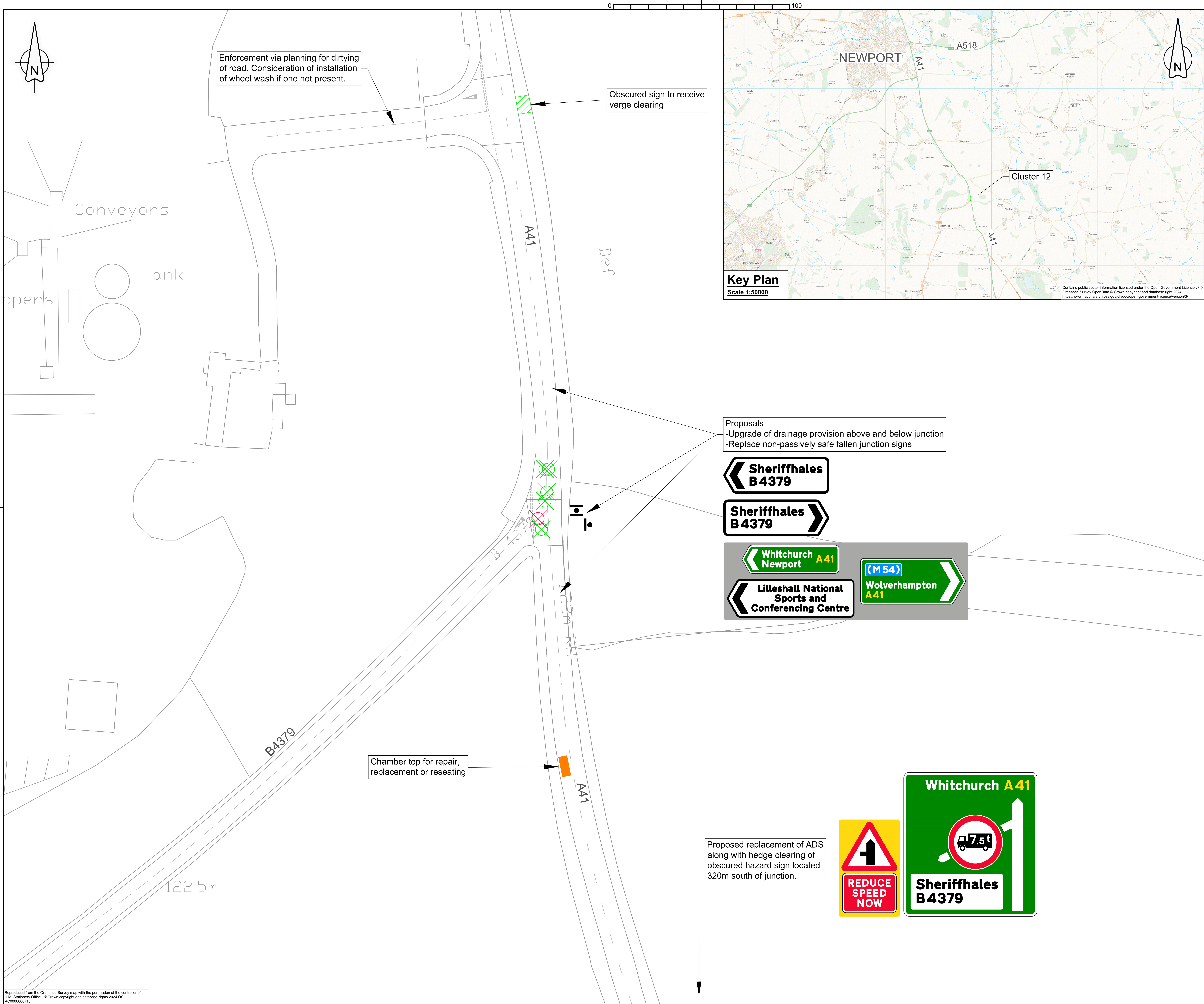
Drawing Title
Proposed Options Plan
Cluster Site 10 - Forton Roundabout (A41/A519/B5062)

Project Ref. No:	COMHA1T&W038	Scale :	1:500 @ A1
Stage:	Conceptual Design	Dimensions :	m

Drawing Number

Project Number	Originator	Volume	Location	Type	Role	Number
COMHA1T&W038	AMY	GEN	A41	DR	CH	0017

Suitability	Suitability Description	Revision
S2	Suitable For Information	P01



General Notes

1. DRAWINGS TO BE PRINTED IN COLOUR.
2. This drawing is for reference only and is not to be scaled.
3. All measurements shown are in METRES, unless stated otherwise and are approximate.
4. Proposed replacement signs for junction hazard and ADS are outside drawing extents.
5. Sign faces shown are as per existing and replacements should be designed and checked to TSRGD.
6. This drawing shows recommendations proposed under section 7.9 of Options Study Report COMHA1T&W038-OS-001.

Key

Collision Severity

Fatal

Slight

Verge Clearing

Replacement sign

Chamber top

Designed:	MG	Date:	16/01/2024
Drawn:	MV	Date:	16/01/2024
Checked:	GH	Date:	23/01/2024
Approved:	HH	Date:	09/02/2024

www.amey.co.uk

Working on behalf of

Telford & Wrekin COUNCIL

Project Name

A41 Route Study

Drawing Title

Proposed Options Plan
Cluster Site 12 - B4379 Junction

Project Ref. No: COMHA1T&W038	Scale : 1:500 @ A1
Stage: Conceptual Design	Dimensions : m

Drawing Number

Project Number | Originator | Volume

COMHA1T&W038 - AMY - GEN

A41 -DR-CH- 0018

Location | Type | Role | Number

Suitability	Suitability Description	Revision
S2	Suitable For Information	P01

0 100

Proposed replacement of whole direction sign 160m north of junction

Proposed replacement of northern ADS sign face 205m north of junction

Proposed marker posts and access edge line

Future proposal for King St exit to be widened alongside carriageway resurfacing and markings refresh

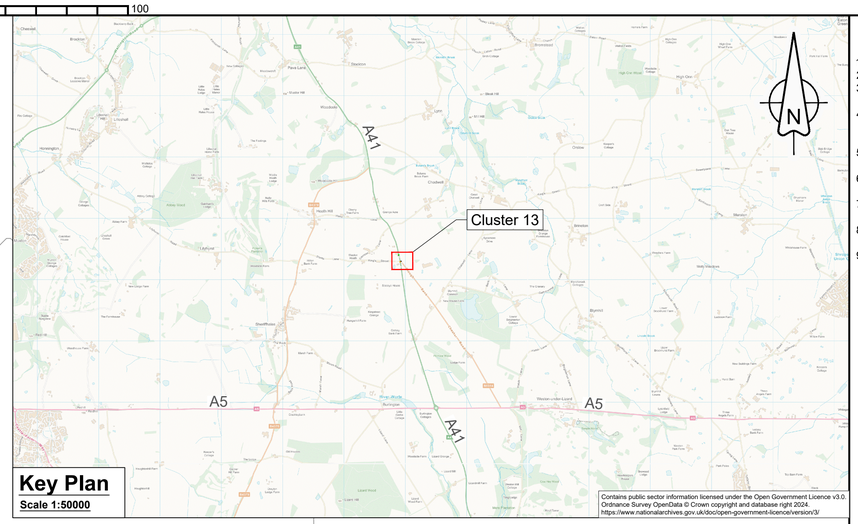
Proposals
-Move corner direction sign for visibility
-Reinstall corner kerbing

Ruins
LB
Weston Farm
A41
Track
Mast (Telecommunication)
King Street
Cottage
TCB
B5314
Corner Farm
125.0m
Lay-by
Pond
Pond

Blymhill
Sheriffhales
Lilleshall Abbey

Wolverhampton (A41)
(M54)
Great Chatwell B 5314
Chatwell Park Farm

Sheriffhales 13¼
Lilleshall Abbey



Key Plan
Scale 1:50000

General Notes

1. DRAWINGS TO BE PRINTED IN COLOUR.
2. This drawing is for reference only and is not to be scaled.
3. All measurements shown are in METRES, unless stated otherwise and are approximate.
4. Extents of recommended safety scheme widening shown indicatively, resurfacing and markings refresh extents not shown and to be determined as part of scheme development.
5. Marker posts arrangement for private accesses given in drawing COMHA1T&W038-AMY-GEN-A41-DR-CH-0002.
6. Junction arrangement for widening of King St. given in drawing COMHA1T&W038-AMY-GEN-A41-DR-CH-0003.
7. Movement of the existing corner sign should be made following guidance within DMRB CD123, Traffic Signs Manual and LTN 1/94.
8. Sign faces shown are as per existing and replacements should be designed and checked to TSRGD.
9. This drawing shows recommendations proposed under section 7.10 of Options Study Report COMHA1T&W038-OS-001.

Key

Collision Severity

Serious

Slight

Sign

Proposed marker post

Replaced kerb

Proposed kerb widening

Designed:	MG	Date: 16/01/2024
Drawn:	MV	Date: 16/01/2024
Checked:	GH	Date: 23/01/2024
Approved:	HH	Date: 09/02/2024

Amey
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Working on behalf of
Telford & Wrekin COUNCIL

Project Name
A41 Route Study

Drawing Title
Proposed Options Plan
Cluster Site 13 - King Street Junction

Project Ref. No: COMHA1T&W038	Scale : 1:500 @ A1
Stage: Conceptual Design	Dimensions : m

Drawing Number

Project Number	Originator	Volume
COMHA1T&W038	- AMY -	GEN

Location	Type	Role	Number
A41	-DR-CH-		0019

Suitability	Suitability Description	Revision
S2	Suitable For Information	P01