



Client:

**Richborough**

Project:

**Land east of Rugby Road  
Clifton upon Dunsmore**

Project No:

**T25501**

Report Title

**Transport Assessment Addendum**

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**Hub Transport Planning Ltd**

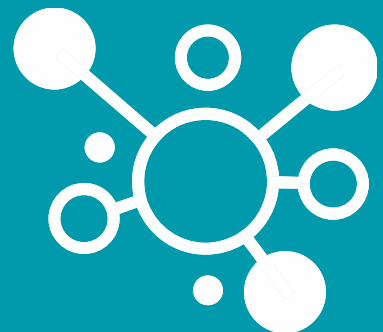
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# 1.0 Introduction

## Background

- 1.1 Hub Transport Planning Ltd has been commissioned by Richborough to provide transport advice for a proposed residential development on land east of Rugby Road, Clifton upon Dunsmore, Rugby.
- 1.2 The site location is shown in **Figure 1.1**.
- 1.3 This Transport Assessment Addendum (TAA) has been prepared to support an outline planning application for up to 160 residential dwellings, with all matters reserved except for access.

## Structure of the Report

- 1.4 This TAA is intended to present additional information to Warwickshire County Council (WCC), as the local highway authority, which were not available at the time of writing the initial TA.
- 1.5 Following this introduction, the report is set out as follows:
  - Section 2.0 – Background Information;
  - Section 3.0 – Highway Safety;
  - Section 4.0 – Traffic Generation, Distribution and Assignment;
  - Section 5.0 – Traffic Impact;
  - Section 6.0 – Summary and Conclusion.

## Limitations of the Report

- 1.6 This report has been undertaken at the request of Richborough, thus should not be entrusted to any third party without written permission from Hub Transport Planning Ltd. However, should any information contained within this report be used by any unauthorised third party, it is done so entirely at their own risk and shall not be the responsibility of Hub Transport Planning Ltd.
- 1.7 This report has been compiled using data from a number of external sources (such as TRICS and traffic count data); these sources are considered to be trustworthy and therefore the data provided is considered to be accurate and relevant at the time of preparing this report.

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## 2.0 Background Information

- 2.1 Hub prepared a TA (13/06/2025) in support of the planning application which presented information and assessment of highway elements relating to the proposed development.
- 2.2 As part of the initial pre-application engagement, Hub produced a Transport Assessment Scoping Report (TASR) which outlined the proposals as well as a methodology for assessment. WCC provided a response to the TASR on 31/08/2021 (Document Ref: R460). The full response is included at **Appendix A**.
- 2.3 Within their response, WCC requested that all trip rates, trip generation, distribution and assignment is undertaken in accordance with the WCC Modelling Protocol. All junction assessments should be informed by distribution of trips based on Mobile Network Data (MND) and assignment of trips within the Rugby Wide Area (RWA) S-Paramics model.
- 2.4 In addition to the S-Paramics RWA model assessment, WCC requested that the following off-site junctions should be modelled. These include:
  - Butlers Leap/Clifton Road/Houlton Way (4-arm signalised junction);
  - Hillmorton Lane/Houlton Way (4-arm signalised junction);
  - The Kent/Hillmorton Lane (shuttle signals)
- 2.5 WCC also requested that consideration should be given to the potential development impact at the St Thomas Cross junction (Newton Manor Lane/Newton Road) to the north of Clifton village in terms of capacity and safety. They stated that the junction is of local concern and could become busier due to major committed developments in the area.
- 2.6 In response to WCC on the modelling methodology, Hub produced a Modelling Briefing Note outlining the intention to use the RWA S-Paramics model in January 2025. The methodology presented within the note was agreed with by WCC. The Modelling Briefing Note and WCC response is included at **Appendix B** and **Appendix C**, respectively.
- 2.7 In addition to the modelling, also presented within this TAA is:
  - Further highway safety analysis; and,
  - Highway mitigation measures.

## 3.0 Highway Safety

### Personal Injury Accident Data

- 3.1 A further review of highway safety has been undertaken as part of this TAA.
- 3.2 To establish existing safety conditions in the vicinity of the site access junction, a review of Personal Injury Accident (PIA) data has been undertaken.
- 3.3 Additional PIA data was requested for all junctions within Clifton upon Dunsmore along Vicarage Hill, Rugby Road, Main Street and Lilbourne Road from WCC for the most recent five years of available data (2020-2025, inclusive).
- 3.4 **Table 1** summarises the total number of PIAs by year and severity from both the initial TA and as part of this TAA. The detailed PIA data is included at **Appendix D**.

**Table 1: Personal Injury Accident (PIA) Data (2020-2025, inclusive)**

Year	Slight	Serious	Fatal	Total
2020	0	0	0	0
2021	0	0	0	0
2022	1	0	0	1
2023	2	0	0	2
2024	0	0	0	0
2025	1	0	0	1
<b>Total</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>

- 3.5 **Table 1** demonstrates that a total of four PIAs have been recorded within the vicinity of the site, all classified as 'Slight'.
- 3.6 Three of the PIAs were recorded at the Butlers Leap/Houlton Way junction to the south of the site (PIA 2,3,4).
- 3.7 PIA 2 appears to be as a result of a vehicle traveling southbound from Clifton Road, failing to stop at a red-light signal, and colliding with a vehicle heading eastbound from the Butlers Leap Arm.
- 3.8 Both PIA 3 and 4 appear to be as a result of driver error, and it cannot be concluded from the details provided that these were because of the arrangement of the junction.
- 3.9 Whilst all PIAs are regrettable, the volume and nature of PIAs do not suggest that there is an inherent highway safety issue caused by the configuration of the local highway network.
- 3.10 Considering this, there is no undue cause for concern with regards to highway safety within the vicinity of the site, and it is reasonable to assume that any potential impact is likely to reduce further from the site as development traffic distributes across the network.

## 4.0 Development Proposals

### Highway Mitigation Measures

4.1 The highway mitigation measures set out within this TAA include:

- Improvements on Rugby Road; and
- Public Transport infrastructure improvements

#### *Improvements on Rugby Road*

4.2 A further review of the existing walking and cycling infrastructure has been undertaken to the south of the site along Rugby Road following concerns raised by WCC as part of their response to the TASR.

4.3 Specifically, WCC stated:

*“The footways to the south-west of the site on the C213 in the direction of Rugby are variable in width, with the width constrained at the locations of the disused railway bridge and canal bridge, and other observations suggest that footway parking affects the usable width of the footway in other locations along this route variably throughout the day. The footway in this direction is also only continuous by virtue of crossing the carriageway, however it is unclear whether a suitable and safe facility exists to do so.”*

4.4 The potential to signalise the disused railway bridge to allow for widening of the footway at this location has been explored following receipt of the RWA model outputs.

4.5 A junction modelling exercise has been undertaken which determines that a shuttle signal scheme on the disused railway bridge, to accommodate a wider footway, can be achieved with minimal queuing and delay. The associated modelling work is presented in Section 6.0 of this report.

4.6 The dimensions of the scheme would comprise the following:

- Carriageway width: 4.5m
- Footway width: 2.5m

4.7 Swept path analysis of a max legal length articulated vehicle has been undertaken travelling westbound, which represents the most onerous manoeuvre required to be accommodated, and demonstrates that the vehicle can undertake this without any issues.

4.8 As part of the scheme, a Puffin crossing is proposed across the western arm to facilitate pedestrian crossing over Vicarage Hill. This is prior to the section of Rugby Road where temporary kerbside parking has been observed during certain periods of the day.

4.9 The provision of the puffin crossing would use the verge on the northern side of Vicarage Hill, immediately west of the disused railway bridge, which would be resurfaced to provide a new section of footway; however, it should be noted that the existing width of 1.7m is constrained by third-party land beyond the existing fence line.

4.10 The highway boundary extent is provided at **Appendix E**.

4.11 An additional crossing point is proposed further south via an uncontrolled dropped kerb tactile crossover to the south of Avon Street.

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- 4.12 The full scheme proposal is presented in **Drawing T25501.003**.
  - 4.13 Considering the limited footway and carriageway width along Vicarage Hill further south of the disused railway bridge to accommodate dedicated cycle infrastructure, cyclists would be required to use the carriageway for a short distance before accessing the shared facility on Houlton Way.
  - 4.14 The existing carriageway over the disused railway bridge accommodates two-way traffic with lanes measuring c.2.75m in width. The proposed signal scheme will create a single lane of 4.5m in width over the bridge which provides more clearance between cyclists and other vehicles compared to the existing arrangement.

*Public Transport Infrastructure Improvements*

- 4.15 As part of the proposals, infrastructure improvements are proposed to the northbound and southbound bus stops on Rugby Road to the northeast of the site.
- 4.16 The northbound bus stop would be relocated further to the south where there is suitable space to accommodate a new bus shelter, which would be accompanied by a flag and pole sign with new timetable and real time journey information.
- 4.17 This would be replicated for the southbound bus stop along with widening of the footway between the bus shelter and the kerb line to 2.0m to not obstruct pedestrian traffic.
- 4.18 A dropped kerb tactile is proposed over Rugby Road to facilitate access to the northbound bus stop.
- 4.19 The proposed scheme is present in **Drawing T25501.004**.

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## 5.0 Trip Generation, Distribution and Assignment

### Introduction

- 5.1 As part of their response to the TASR, WCC provided a note on the methodology that should be adopted to distribute and assign the proposed development traffic.
- 5.2 The methodology requested by WCC is included at **Appendix A**.
- 5.3 Hub produced a Modelling Briefing Note outlining the intention to use the RWA S-Paramics model. As previously stated, the methodology presented within the Note was agreed with by WCC and is included at **Appendix B**.
- 5.4 The distribution and assignment of development traffic has been undertaken by SLR Consulting Ltd using the RWA S-Paramics model.
- 5.5 SLR have produced a Modelling Assumptions Note and Results Covering Note to accompany the model outputs. This section summarises the key items within the notes, with the full information presented at **Appendix F** and **Appendix G**.

### Trip Generation

- 5.6 Whilst already presented within the initial TA report, it is worth reiterating that the following methodology was adopted to generate development traffic to feed into the RWA S-Paramics model, as requested by WCC.
- 5.7 Specifically, the following information on trip rates was requested:
  - Vehicle trip rates and trip generation for the AM (07:00-10:00) and PM (16:00-19:00) periods to analyse the full impact of the development during the pre-peak, peak and post peak periods.
  - Data range to exclude Covid-19 periods.
  - Data to be presented for neutral weekdays, Tuesday to Thursday, thus excluding Monday and Friday surveys.
  - Include any assumptions on parameters used.
- 5.8 A TRICS assessment in accordance with the WCC Modelling Protocol Advice Note – Model Licensing (October 2023) was undertaken using the industry standard TRICS database (v7.11.4).
- 5.9 The full TRICS assumptions are included within the Modelling Briefing Note presented at **Appendix B**. Again, it should be noted that WCC agreed with the trip generation methodology and the subsequent trip generation presented.
- 5.10 The initial trip generation presented within the Modelling Briefing Note was calculated based on 180 units, however, since then the number of units have reduced to 160. The trip generation has therefore been updated accordingly and is used within the subsequent assessment.
- 5.11 The total vehicular trip generation calculated from TRICS for the midweek period is presented in **Table 2** and **Table 3** for the highway network peak hours and 6-hour model periods, respectively.

**Table 2: Trip Generation (Midweek AM & PM Peak Hour) - 160 Dwellings**

Peak Period	Trip Rate (per dwelling)		Trips		Total
	In	Out	In	Out	
AM (08:00-09:00)	0.146	0.361	23	58	<b>81</b>
PM (17:00-18:00)	0.331	0.158	53	25	<b>78</b>

NB: Figures subject to rounding

**Table 3: Trip Generation (Midweek AM & PM Peak Periods 6-hour) - 160 Dwellings**

Peak Period	Trip Rate (per dwelling)		Trips		Total
	In	Out	In	Out	
AM (07:00-10:00)	0.373	0.828	60	132	<b>192</b>
PM (16:00-19:00)	0.867	0.475	139	76	<b>215</b>

NB: Figures subject to rounding

- 5.12 Development trip checks have been carried out to determine that the magnitude of trips associated with the development in each assessment scenario within the RWA S-Paramics Model correlate with the levels outlined within **Table 2** and **Table 3**.
- 5.13 All development trip checks and assumptions are provided within the Model Assumptions Note, produced by SLR, at **Appendix F**.

**Trip Distribution and Assignment**

- 5.14 As requested by WCC, Mobile Network Data (MND) was obtained for LSOA E010331129 where the site is located. This provided distribution proportions to feed into the RWA S-Paramics model as required under the WCC Modelling Protocol Advice Note 005 – Mobile Network Data document.
- 5.15 The LSOA trip distribution diagrams are provided at **Appendix H**, with the resultant trip distribution to each zone within the model summarised in the SLR Model Assumptions Note.
- 5.16 All trips have been assigned onto the network using the RWA S-Paramics model which considers future scenarios in which committed development and local plan sites come forward, which could impact on queueing and delay across the network and hence influence journey times and route choices across the network.
- 5.17 Further information on the distribution and assignment methodology is provided within the Model Assumptions Note and Results Covering Note, respectively.

## 6.0 Traffic Impact

### Introduction

- 6.1 This section presents the potential impact of the proposed development on both the proposed site access junction along with off-site junctions requested by WCC.
- 6.2 As part of the modelling methodology note provided by WCC in response to the TASR, the following off-site junctions were requested for assessment using local junction modelling software, as a minimum:
- Butlers Leap/Clifton Road/Houlton Way (4-arm signalised junction);
  - Hillmorton Lane/Houlton Way (4-arm signalised junction); and,
  - The Kent/Hillmorton Lane (shuttle signals).
- 6.3 In addition to this, consideration was requested to be given to the potential development impact of the proposed development on the Newton Manor/Newton Road St Thomas Cross junction in terms of capacity and safety.
- 6.4 In summary, this section assesses the following junctions using individual junction capacity modelling software, where required:
- Junction 1 - Rugby Road/Site Access (priority T-junction);
  - Junction 2 - Butlers Leap/Clifton Road/Houlton Way (4-arm signalised junction);
  - Junction 3 - Hillmorton Lane/Houlton Way (4-arm signalised junction);
  - Junction 4 - The Kent/Hillmorton Lane (shuttle signals);
  - Junction 5 - Newton Manor Road/Newton Road (3-arm priority junction); and,
  - Junction 6 - Rugby Road mitigation scheme (shuttle signals).
- 6.5 It should be noted that SLR confirmed that no other junctions within the RWA S-Paramics model were identified to receive more than 30 two-way development trips in any assessment scenario within the AM and PM peak hours. On that basis, no further junction assessments beyond those noted above have been undertaken.
- 6.6 The confirmation from SLR is presented at **Appendix I**.

### Assessment Scenarios

- 6.7 As noted within the initial TA, at the time of writing, the RWA S-Paramics model was undergoing updates and was not ready to be used. It was, however, highlighted by the WCC modelling team that new assessment scenarios would be included as part of the model updates which would supersede those requested as part of the modelling methodology note provided by WCC.
- 6.8 It can be confirmed as part of this TAA that the following scenarios are included within the updated RWA S-Paramics Model:
- 2035 Reference Case
  - 2045 Reference Case
  - 2045 Local Plan

- 6.9 On that basis, the following assessment scenarios have been included within each junction capacity model for both the AM and PM peak hours:
- 2035 Reference Case
  - 2035 Reference Case + Development
  - 2045 Reference Case
  - 2045 Reference Case + Development
  - 2045 Local Plan
  - 2045 Local Plan + Development
- 6.10 Within their TASR response, WCC requested that assessment of the junctions will be required using either the demand flows or modelled flows, whichever is highest. It is unclear whether this relates to the sum of all flows across all junctions, cumulatively, (including all assessment scenarios and peaks) or whether this relates to the higher of the flows for individual assessment years and peaks for each junction (e.g. demand flows in the AM and modelled flows in the PM for an assessment scenario).
- 6.11 As such, the higher of the two turning flow sets for each junction (sum of all assessment scenarios and peaks) has been used, depending on the junction being assessed. Notwithstanding that the model will assume some changes in route choices between assessment scenarios; this provides a consistently robust assessment across each scenario and peak period.
- 6.12 A comparison between the total demand and modelled turning flows for each junction is summarised in **Table 4** and included at **Appendix J**. The higher set of turning flows (demand or modelled) for each junction has been used.

**Table 4: Total Junction Demand and Modelled Turning Flow Comparison**

Junction	Total Demand Flows	Total Modelled Flows	Flow Set Used
Junction 1 - Rugby Road/Site Access	4696	6404	Modelled
Junction 2 - Butlers Leap/Clifton Road/Houlton Way	25538	23104	Demand
Junction 3 - Hillmorton Lane/Houlton Way	20088	19595	Demand
Junction 4 - The Kent/Hillmorton Lane	7277	8844	Modelled

- 6.13 To note, Junction 5 has been assessed using a qualitative approach to development traffic routing through the junction. This is detailed later in this section.
- 6.14 The turning flow matrices (demand and modelled) from the RWA S-Paramics Model for each junction are provided at **Appendix K** for each assessment scenario and peak hour.

**Model Network Summary**

- 6.15 To determine how the overall model performed across the various scenarios, network statistics focusing on changes to network mean delay, total completed trips and mean speed has been extracted.
- 6.16 **Table 5 - Table 7** presents the statistics for the modelled scenarios during the three-hour AM (07:00-10:00) and PM (16:00-19:00) peak periods.

**Table 5: RWA S-Paramics Network Statistics – 2035 Reference Case + Development**

Metric	AM (07:00 to 10:00)			PM (16:00 to 19:00)		
	2035 Reference Case	2035 Ref + Dev	% change from Ref Case	2035 Reference Case	2035 Ref + Dev	% change from Ref Case
Network Mean Delay (s)	421	420	-0.2%	457	459	+0.4%
Total Completed Trips (veh)	104,689	104,879	+0.2%	115,079	115,226	+0.1%
Mean Speed (km/hr)	52	52	0%	47	46	-1%

**Table 6: RWA S-Paramics Network Statistics - 2045 Reference Case + Development**

Metric	AM (07:00 to 10:00)			PM (16:00 to 19:00)		
	2045 Reference Case	2045 Ref + Dev	% change from Ref Case	2045 Reference Case	2045 Ref + Dev	% change from Ref Case
Network Mean Delay (s)	460	463	+0.7%	531	531	0%
Total Completed Trips (veh)	109,553	109,758	+0.2%	120,113	120,282	+0.1%
Mean Speed (km/hr)	48	48	0%	41	41	0%

**Table 7: RWA S-Paramics Network Statistics - 2045 Local Plan + Development**

Metric	AM (07:00 to 10:00)			PM (16:00 to 19:00)		
	2045 Local Plan	2045 Local Plan + Dev	% change from Local Plan	2045 Local Plan	2045 Local Plan + Dev	% change from Local Plan
Network Mean Delay (s)	442	442	0%	487	491	+0.8%
Total Completed Trips (veh)	111,193	111,397	+0.2%	122,591	122,711	+0.1%
Mean Speed (km/hr)	50	50	0%	44	44	0%

- 6.17 The network statistics show that the network remains relatively stable with less than a 1% increase across all three metrics as a result of development traffic.
- 6.18 This demonstrates that the proposed development will create a negligible impact to the overall operation of the network across all assessment scenarios and peak periods.
- 6.19 The network statistics summary is included at **Appendix L**

**Junction Models**

- 6.20 All junction models have been built using the industry standard Junctions 11 software for priority junctions, and LinSig for signalised junctions.
- 6.21 Hub was informed that approved LinSig models for the off-site junctions were held by WCC and have therefore been obtained and used for the purpose of this assessment.

**Junction Capacity Assessment Results**

- 6.22 This section summarises the results of the junction capacity assessments with the model output files included in full at **Appendix M**.

*Junction 1 -Rugby Road/Site Access (PICADY Assessment)*

- 6.23 Junction 1 has been assessed using the PICADY module within the Junctions 11 software package.
- 6.24 It should be noted that the Rugby Road/Newall Close junction was not included within the RWA S-Paramics model and therefore there are no inbound/outbound turning flows for Newall Close included within the model outputs.
- 6.25 On that basis, the turning flows recorded as part of a Manual Classified Turning Count (MCC), undertaken on 08/02/2023, have been added to the PCU turning flows for the Rugby Road/Site Access presented for 'Site 1' at **Appendix K**.
- 6.26 This is considered a suitable proxy given the absence of model data and given that the flows to/from Newall Close are relatively low and unlikely to create a material impact on the operation of the junction.
- 6.27 The Network Flow Diagram of the site access junction is presented at **Appendix N** which includes the turning flows for the Rugby Road/Newall Close junction observed as part of the MCC.
- 6.28 The results of the junction capacity assessment are summarised in **Table 8**.

**Table 8: Site Access/Rugby Road Junction Model Results – PICADY Results**

Approach	AM Peak 08:00-09:00			PM Peak 17:00-18:00		
	RFC	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)
<b>2035 Reference Case + Development</b>						
Site Access	0.07	0	9	0.03	0	10
Rugby Road	0.03	0	5	0.07	0	5
<b>2045 Reference Case + Development</b>						
Site Access	0.07	0	10	0.03	0	10
Rugby Road	0.03	0	5	0.07	0	5
<b>2045 Local Plan + Development</b>						
Site Access	0.07	0	9	0.03	0	9
Rugby Road	0.04	0	6	0.07	0	6

- 6.29 **Table 8** demonstrates that the proposed site access is forecast to operate with plenty of spare capacity in all assessment scenarios, with minimal queuing and delay.
- 6.30 Given the results of the capacity assessment, it is considered that the level of impact on Newall Close at the reconfigured Site Access/Newall Close junction is negligible.

*Junction 2 – Butlers Leap/Clifton Road/Houlton Way (LinSig Assessment)*

- 6.31 Junction 2 has been assessed using an approved LinSig model obtained directly from WCC.
- 6.32 The flows included within the model, for each assessment scenario, have been taken directly from the PCU turning flow matrices for 'Site 2' at **Appendix K**.

- 6.33 It should be noted that the junction model obtained from WCC includes a cycle time of 180 seconds. Within the 2045 Reference Case and 2045 Local Plan PM peak periods (including with/without development), the cycle time has been manually adjusted to 240 seconds to achieve an improved PRC result.
- 6.34 Whilst this may not be the exact cycle time employed on-site, LinSig is limited to modelling fixed cycle times. To provide some context, the junction uses variable cycle times throughout the day as it operates on a MOVA system, as shown in Drawing No. 24.2-229-002 Rev B in **Appendix O**. Therefore, the use of an extended cycle time is a representation of the maximum available cycle time for the junction.
- 6.35 In addition to this, the Network Control Plan contains an all-red traffic stage each cycle to accommodate for pedestrian/cyclist crossing. However, depending upon demand under the variable cycle times, it is reasonable to assume that the all-red traffic stage may not be called very often, hence increasing green time for traffic phases and improving the overall junction operation.
- 6.36 The results of the junction capacity assessment are summarised in **Table 9**.

**Table 9: Butlers Leap/Clifton Road/Houlton Way – LinSig Results**

Approach	AM Peak 08:00-09:00			PM Peak 17:00-18:00		
	DoS (%)	MMQ (PCUs)	Delay (s/PCU)	DoS (%)	MMQ (PCUs)	Delay (s/PCU)
<b>2035 Reference Case</b>						
Clifton Road N	55.4	3	47	35.2	3	42
Houlton Way	66.1	12	21	43.0	7	15
Clifton Road S	70.5	9	41	80.0	10	47
Butlers Leap	61.7	11	23	85.2	23	29
Cycle Time (s)	180			180		
PRC (%)	27.7			5.6		
Delay (PCU/Hr)	14.54			17.53		
<b>2035 Reference Case + Development</b>						
Clifton Road N	63.4	4	49	39.5	3	43
Houlton Way	67.5	13	22	43.0	7	15
Clifton Road S	68.9	9	39	83.1	11	50
Butlers Leap	64.7	11	25	87.0	24	31
Cycle Time (s)	180			180		
PRC (%)	30.6			3.4		
Delay (PCU/Hr)	15.63			18.96		
<b>2045 Reference Case</b>						
Clifton Road N	70.0	3	61	54.7	4	61
Houlton Way	79.3	20	23	50.0	12	17
Clifton Road S	82.5	11	50	88.8	17	68
Butlers Leap	72.3	11	26	90.5	38	38
Cycle Time (s)	180			240		
PRC (%)	9.1			-0.6		
Delay (PCU/Hr)	19.73			26.87		

Approach	AM Peak 08:00-09:00			PM Peak 17:00-18:00		
	DoS (%)	MMQ (PCUs)	Delay (s/PCU)	DoS (%)	MMQ (PCUs)	Delay (s/PCU)
<b>2045 Reference Case + Development</b>						
Clifton Road N	70.9	4	56	61.6	4	64
Houlton Way	83.4	20	28	50.3	12	17
Clifton Road S	76.5	10	43	91.3	19	73
Butlers Leap	81.0	13	33	92.7	41	43
Cycle Time (s)	180			240		
PRC (%)	7.9			-3.0		
Delay (PCU/Hr)	21.28			30.04		
<b>2045 Local Plan</b>						
Clifton Road N	54.2	3	50	51.1	3	62
Houlton Way	74.0	17	20	49.0	12	16
Clifton Road S	76.2	9	48	84.3	14	62
Butlers Leap	59.8	9	21	86.1	33	31
Cycle Time (s)	180			240		
PRC (%)	18.1			4.5		
Delay (PCU/Hr)	15.50			22.82		
<b>2045 Local Plan + Development</b>						
Clifton Road N	54.8	3	49	54.0	3	62
Houlton Way	75.4	20	22	49.3	12	17
Clifton Road S	73.3	9	46	87.1	15	65
Butlers Leap	64.3	11	23	88.6	36	35
Cycle Time (s)	180			240		
PRC (%)	19.3			1.6		
Delay (PCU/Hr)	16.62			25.05		

- 6.37 **Table 9** demonstrates that the junction will operate within practical capacity within the 2035 Reference Case scenario, across both peak periods, both with and without development traffic.
- 6.38 The junction slightly exceeds its practical capacity in the 2045 Reference Case scenario in the PM Peak without development, with a junction PRC of -0.6%, with the Butlers Leap arm reaching a Degree of Saturation (DoS) of 90.5%. and with the Clifton Road S arm approaching its practical capacity with a DoS of 88.8%.
- 6.39 Within the 2045 Reference Case + Development scenario in the PM Peak, the junction remains over capacity with a PRC of -3.0%, with the DoS slightly increasing on Butlers Leap to 92.7%, and the DoS on Clifton Road South slightly increasing to 91.3%. However, it should be noted that the development impact is negligible, with an increase in queuing of only 2 PCUs on Clifton Road South and 3 PCUs on Butlers Leap.
- 6.40 The junction operates within its practical capacity in the 2045 Local Plan scenario across both peak periods, including with the addition of development traffic.

- 6.41 Whilst the model results forecast the junction to operate slightly over its practical capacity within the 2045 Reference Case scenario in the PM Peak, the junction will use variable cycle times throughout the day depending upon demand and it is therefore likely that the junction would operate better than shown within the LinSig model (which can only model fixed cycle times).
- 6.42 In summary, traffic associated with the proposed development has a minimal impact on the junction with only very limited increases in queueing and delay across all arms in all future scenarios. On the basis of the assessment work undertaken, no mitigation is required to accommodate the proposed development site.

*Junction 3 – Hillmorton Lane/Houlton Way (LinSig Assessment)*

- 6.43 Junction 3 has been assessed using an approved LinSig model obtained directly from WCC.
- 6.44 The flows included within the model, for each assessment scenario, have been taken directly from the PCU turning flow matrices for 'Site 3' at **Appendix K**.
- 6.45 The results of the junction capacity assessment are summarised in **Table 10**.

**Table 10: Hillmorton Lane/Houlton Way – LinSig Results**

Approach	AM Peak 08:00-09:00			PM Peak 17:00-18:00		
	DoS (%)	MMQ (PCUs)	Delay (s/PCU)	DoS (%)	MMQ (PCUs)	Delay (s/PCU)
<b>2035 Reference Case</b>						
Hillmorton Lane N	34.5	2	22	33.2	2	20
Houlton Way E	68.1	12	20	42.3	6	13
Hillmorton Lane S	72.5	6	49	70.4	5	48
Houlton Way W	50.3	5	52	70.4	13	54
Cycle Time (s)	90			90		
PRC (%)	24.1			27.8		
Delay (PCU/Hr)	10.98			10.30		
<b>2035 Reference Case + Development</b>						
Hillmorton Lane N	34.5	2	22	33.2	2	20
Houlton Way E	68.1	12	20	42.3	6	13
Hillmorton Lane S	72.5	6	49	70.8	5	48
Houlton Way W	51.5	5	52	70.5	13	54
Cycle Time (s)	90			90		
PRC (%)	24.1			27.0		
Delay (PCU/Hr)	11.04			10.34		
<b>2045 Reference Case</b>						
Hillmorton Lane N	41.4	2	29	31.8	2	29
Houlton Way E	84.0	20	25	56.2	9	14
Hillmorton Lane S	84.3	7	50	82.0	6	48
Houlton Way W	76.3	8	73	87.2	22	64

Approach	AM Peak 08:00-09:00			PM Peak 17:00-18:00		
	DoS (%)	MMQ (PCUs)	Delay (s/PCU)	DoS (%)	MMQ (PCUs)	Delay (s/PCU)
<b>2045 Reference Case</b>						
Cycle Time (s)	90			90		
PRC (%)	6.7			3.2		
Delay (PCU/Hr)	16.41			16.10		
<b>2045 Reference Case + Development</b>						
Hillmorton Lane N	41.4	2	30	31.8	2	30
Houlton Way E	84.0	20	25	56.2	9	14
Hillmorton Lane S	84.3	7	50	82.4	6	48
Houlton Way W	77.6	8	73	87.4	22	65
Cycle Time (s)	90			90		
PRC (%)	6.7			3.0		
Delay (PCU/Hr)	16.55			16.23		
<b>2045 Local Plan</b>						
Hillmorton Lane N	28.6	2	37	28.2	2	27
Houlton Way E	82.5	19	24	54.1	8	14
Hillmorton Lane S	83.7	7	47	79.5	6	47
Houlton Way W	82.7	7	69	85.4	21	64
Cycle Time (s)	90			90		
PRC (%)	7.5			5.3		
Delay (PCU/Hr)	16.38			14.53		
<b>2045 Local Plan + Development</b>						
Hillmorton Lane N	28.6	2	33	28.2	2	27
Houlton Way E	80.9	18	23	54.1	8	14
Hillmorton Lane S	89.5	9	47	80.5	6	47
Houlton Way W	79.7	7	86	85.5	21	65
Cycle Time (s)	90			90		
PRC (%)	0.5			5.2		
Delay (PCU/Hr)	16.74			14.68		

- 6.46 **Table 10** demonstrates that the Hillmorton Lane/Houlton Way junction is forecast to operate within practical capacity across all assessment scenarios and peak periods.
- 6.47 The model shows that during the 2045 Local Plan + Development AM Peak scenario, the junction operates just within practical capacity. The main increase in flows is on Houlton Way West (4 additional trips), and from review of the model, it appears that the change in PRC is a result of a reallocation of green time from Hillmorton Lane South to Houlton Way West within the LinSig model, which is running on a fixed cycle time.
- 6.48 In reality, it is likely that the additional flows could route through the junction within the 90 second cycle without the reallocation of green time, particularly given that the junction operates using a MOVA system, which means

that it will operate better using variable cycle times as opposed to the fixed cycle times included in the LinSig model.

6.49 The junction is shown on Drawing No. 24.2-228-010 Rev A, provided by WCC and included at **Appendix O**.

*Junction 4 – The Kent/Hillmorton Lane (LinSig Assessment)*

6.50 Junction 4 has been assessed using an approved LinSig model obtained directly from WCC.

6.51 The flows included within the model, for each assessment scenario, have been taken directly from the PCU turning flow matrices for ‘Site 4’ at **Appendix K**. This has been done using the northbound/southbound movements for Arm A.

6.52 The results of the junction capacity assessment are summarised in **Table 11**.

**Table 11: The Kent/Hillmorton Lane – LinSig Results**

Approach	AM Peak 08:00-09:00			PM Peak 17:00-18:00		
	DoS (%)	MMQ (PCUs)	Delay (s/PCU)	DoS (%)	MMQ (PCUs)	Delay (s/PCU)
<b>2035 Reference Case</b>						
The Kent N	51.3	5	23	59.8	6	27
The Kent S	51.8	1	24	62.3	7	24
Cycle Time (s)	64			64		
PRC (%)	73.8			44.4		
Delay (PCU/Hr)	4.08			5.26		
<b>2035 Reference Case + Development</b>						
The Kent N	53.1	5	24	61.0	6	29
The Kent S	51.3	5	23	62.0	7	23
Cycle Time (s)	64			64		
PRC (%)	69.5			45.0		
Delay (PCU/Hr)	4.15			5.29		
<b>2045 Reference Case</b>						
The Kent N	57.9	6	25	74.6	7	36
The Kent S	55.7	6	24	74.7	10	27
Cycle Time (s)	64			64		
PRC (%)	55.5			20.5		
Delay (PCU/Hr)	4.71			7.58		
<b>2045 Reference Case + Development</b>						
The Kent N	55.1	6	23	71.6	7	33
The Kent S	57.5	6	26	76.3	10	28
Cycle Time (s)	64			64		
PRC (%)	56.6			17.9		
Delay (PCU/Hr)	4.64			7.53		

Approach	AM Peak 08:00-09:00			PM Peak 17:00-18:00		
	DoS (%)	MMQ (PCUs)	Delay (s/PCU)	DoS (%)	MMQ (PCUs)	Delay (s/PCU)
<b>2045 Local Plan</b>						
The Kent N	51.0	5	23	64.5	6	30
The Kent S	52.1	5	25	69.1	8	25
Cycle Time (s)	64			64		
PRC (%)	72.7			30.2		
Delay (PCU/Hr)	4.08			6.13		
<b>2045 Local Plan + Development</b>						
The Kent N	53.2	5	23	68.0	6	32
The Kent S	53.5	5	25	69.0	8	24
Cycle Time (s)	64			64		
PRC (%)	68.2			30.5		
Delay (PCU/Hr)	4.28			6.36		

6.53 **Table 11** demonstrates that The Kent/Hillmorton Lane shuttle signals is forecast to operate well within practical capacity across all assessment scenarios and peak periods.

6.54 Notably, the development traffic has a negligible impact on queueing and delay across all future year scenarios.

6.55 The junction signals drawing provided by WCC (Drawing No.24.2-227-001 Rev B) is included at **Appendix O**.

*Junction 5 – Newton Manor Road/Newton Road*

6.56 Review of the potential impact of the proposed development on the Newton Manor Road/Newton Road junction has been undertaken.

6.57 The level of two-way development traffic across each assessment scenario during the peak hours is summarised in **Table 12** and have been taken from the vehicle turning flow matrices for 'Site 5' at **Appendix K**.

6.58 To note, the highest development two-way total for each assessment scenario/peak has been taken from a combination of demand and modelled turning flow sets (whichever is highest) to understand the largest potential volume of development trips through the junction.

**Table 12: Newton Manor Road/Newton Road Development Flows (Two-Way)**

AM Peak 08:00-09:00	PM Peak 17:00-18:00
<b>2035 Reference Case Development Flows</b>	
16	16
<b>2045 Reference Case Development Flows</b>	
15	16
<b>2045 Local Plan Development Flows</b>	
13	17

- 6.59 **Table 12** demonstrates that no more than 17 two-way development trips are forecast to travel through the Newton Manor Road/Newton Road junction during any of the assessment scenarios and peak periods. This equates to approximately one additional vehicle every 3-4 minutes.
- 6.60 This level of trips will not create an unacceptable impact on the operation or safety of the junction and is likely to be imperceptible to existing background traffic.
- 6.61 On that basis, no further assessment has been undertaken of the junction.

*Junction 6 – Rugby Road Mitigation Scheme (LinSig)*

- 6.62 The Rugby Road shuttle signal mitigation scheme has been assessed using LinSig software.
- 6.63 The flows included within the model, for each assessment scenario, have been taken directly from the PCU turning flow matrices for 'Site 1' in **Appendix K**. This has been done using the eastbound/westbound movements for Arm C with the addition of trips from the Newall Close junction recorded as part of the MCC survey.
- 6.64 The flows are also included within the Network Flow Diagram at **Appendix N**.
- 6.65 The results of the junction capacity assessment are summarised in **Table 13**.

**Table 13: Rugby Road Mitigation Scheme - LinSig Results**

Approach	AM Peak 08:00-09:00			PM Peak 17:00-18:00		
	DoS (%)	MMQ (PCUs)	Delay (s/PCU)	DoS (%)	MMQ (PCUs)	Delay (s/PCU)
<b>2035 Reference Case + Development</b>						
Rugby Road E	45.3	4	23	50.7	4	25
Rugby Road W	46.9	4	26	55.0	5	26
Cycle Time (s)	60			60		
PRC (%)	92.0			63.6		
Delay (PCU/Hr)	3.44			4.16		
<b>2045 Reference Case + Development</b>						
Rugby Road E	50.4	5	23	57.4	5	27
Rugby Road W	52.5	4	28	55.8	5	26
Cycle Time (s)	60			60		
PRC (%)	71.4			56.8		
Delay (PCU/Hr)	3.97			4.59		
<b>2045 Local Plan + Development</b>						
Rugby Road E	41.6	4	21	47.2	4	24
Rugby Road W	40.9	3	27	45.5	4	25
Cycle Time (s)	60			60		
PRC (%)	116.4			90.8		
Delay (PCU/Hr)	2.95			3.47		

- 
- 6.66 **Table 13** demonstrates that the proposed Rugby Road shuttle signals will operate with plenty of spare capacity across all assessment scenarios, with the proposed development traffic, with minimal queueing and delay.
- 6.67 On that basis, the proposed shuttle signals are considered to be an appropriate measure to accommodate an increased footway width over the railway bridge and facilitate crossing over Vicarage Hill, whilst also creating a betterment for cyclists to travel across the bridge.

### Summary

- 6.68 This section has demonstrated that the proposed development will not cause a material impact on any of the junctions assessed within the report, nor across the wider network.
- 6.69 Therefore, no mitigation measures are required to accommodate the development traffic.
- 6.70 The Butlers Leap/Houlton Way/Clifton Road junction is already forecast to operate above practical capacity using the fixed cycle times within the LinSig Model within the 2045 Reference Case scenario, without development. However, the junction is likely to operate much better than shown, using variable cycle times throughout the day and with only a demand-dependent all-red traffic phase.

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## 7.0 Summary and Conclusion

### Summary

- 7.1 Hub Transport Planning Ltd has been commissioned by Richborough to provide transport advice in support of an outline planning application for up to 160 residential units on land east of Rugby Road, Clifton upon Dunsmore, Rugby.
- 7.2 This TAA has been prepared to present additional information to Warwickshire County Council (WCC), as the local highway authority, and address matters not previously submitted within the original TA.
- 7.3 Further review of highway safety indicates that the scale and nature of recorded PIAs over the most recent six years of available data does not give any undue cause for concern, and that the level of development traffic will not cause an unacceptable impact on highway safety.
- 7.4 Further information has been provided in respect of mitigation measures to improve sustainable travel, where feasible.
- 7.5 This TAA also includes local junction capacity assessments following a request by WCC to utilise the RWA S-Paramics model to distribute and assign traffic. The capacity assessments have been undertaken to determine the potential development impact within the assessment scenarios provided within the RWA S-Paramics model. These include a 2035 Reference Case, 2045 Reference Case, and 2045 Local Plan.
- 7.6 The results of the junction modelling exercise demonstrates that the impact of the proposed development traffic on the operation of local junctions is negligible, with minimal changes in capacity, delay and queuing. Similarly, there is a negligible impact to the wider network overall in terms of mean delay, total completed trips, and mean speeds.
- 7.7 No junction mitigation is considered necessary to address the impacts of the proposed development traffic.

### Conclusion

- 7.8 Paragraph 116 of the National Planning Policy Framework (NPPF) states that:  
*“Development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network, following mitigation, would be severe, taking into account all reasonable scenarios”.*
- 7.9 The assessment work undertaken and detailed in this report demonstrates that, in NPPF terms, the development will not have a severe impact on the operation of the local highway network or an unacceptable impact on highway safety.
- 7.10 As such, it is considered that there are no reasons why the proposals should be resisted on traffic or transportation grounds.

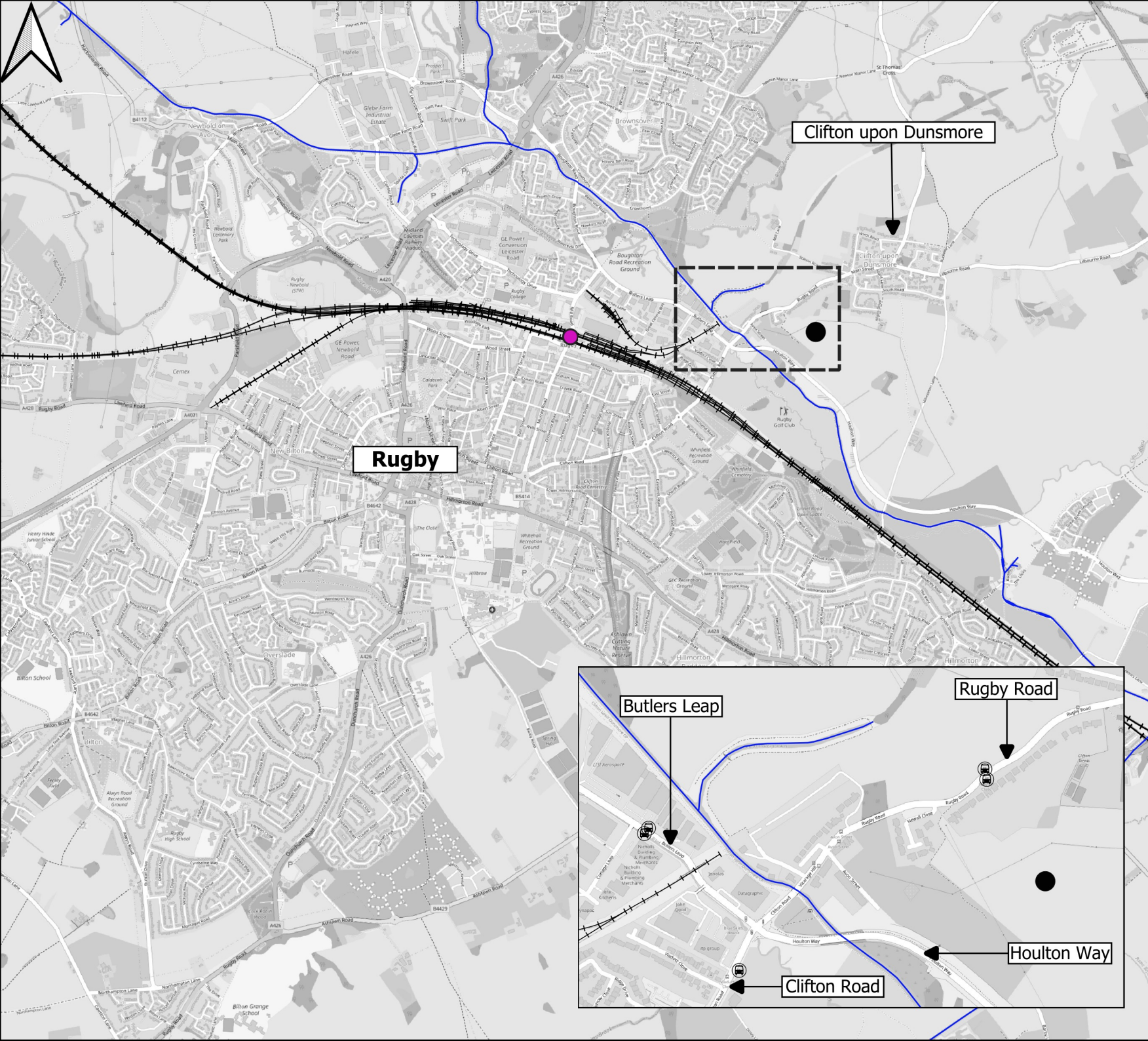
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**T25501**  
**Clifton upon Dunsmore**



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## Figures



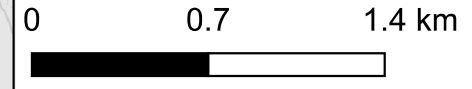
### Legend

- Site Location
- 🚌 Bus Stop
- Railway Station
- +— Railway Network
- Canal Network

Figure 1.1 - Site Location



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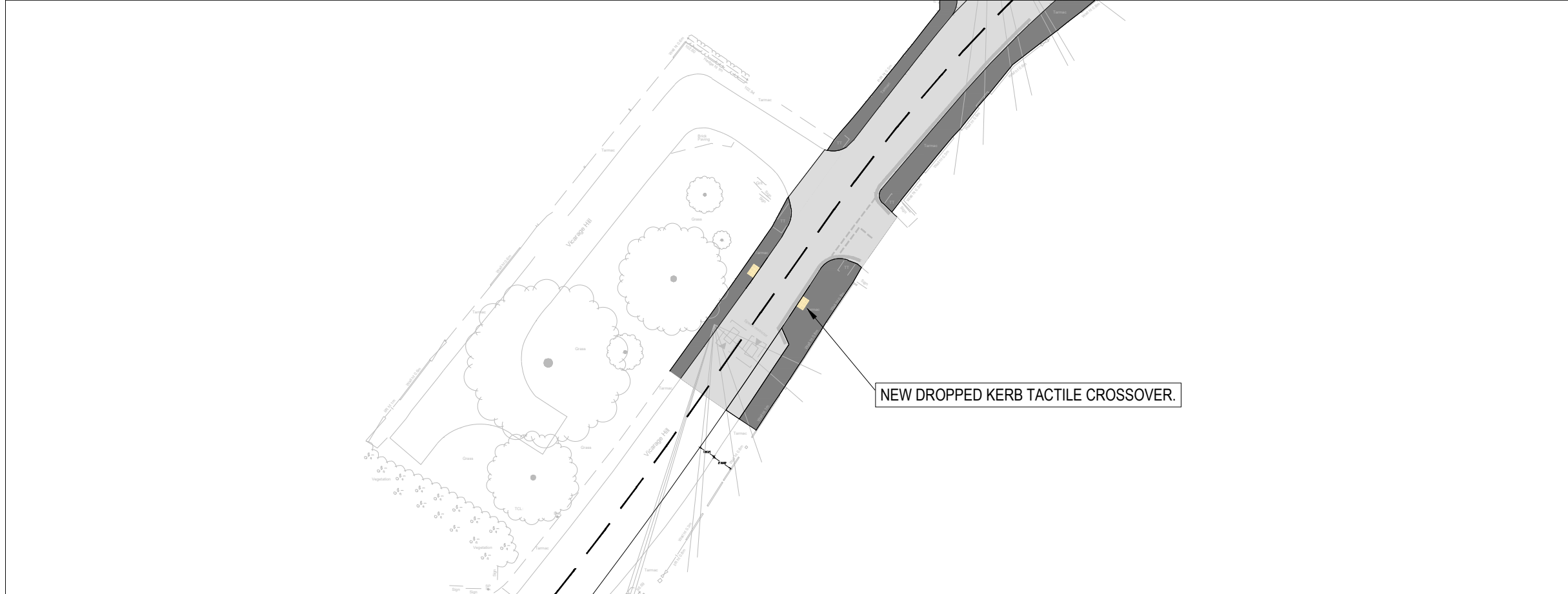
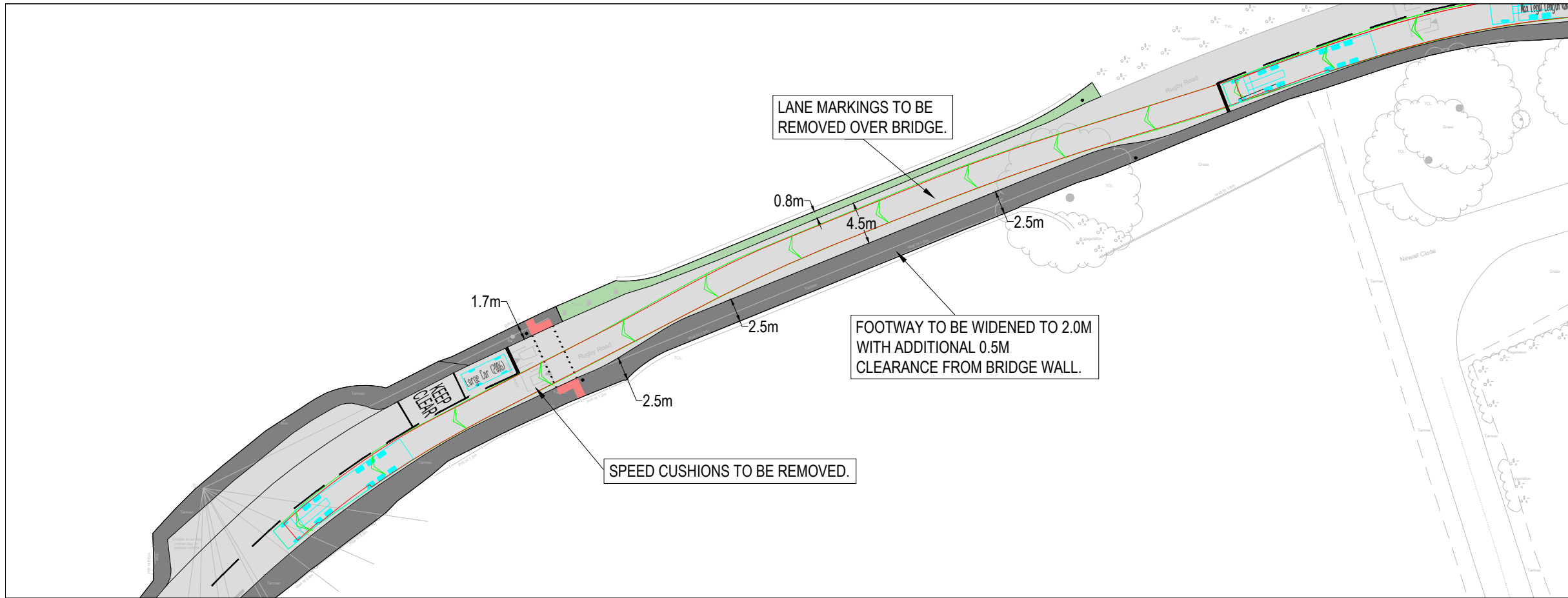


**T25501**  
**Clifton upon Dunsmore**

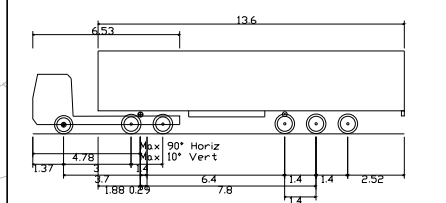


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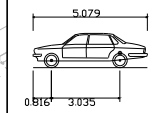
## Drawings



1. THIS DRAWING IS NOT TO BE SCALED FOR CONSTRUCTION PURPOSES.
2. THE CONTRACTOR SHALL CHECK ALL DIMENSIONS AND LEVELS ON SITE.



Max Legal Length (UK) Articulated Vehicle (16.5m)  
 Overall Length 16.500m  
 Overall Width 2.500m  
 Overall Body Height 3.681m  
 Min Body Ground Clearance 0.411m  
 Max Track Width 2.500m  
 Lock to lock time 6.00s  
 Kerb to Kerb Turning Radius 6.530m



Large Car (2006)  
 Overall Length 5.079m  
 Overall Width 1.872m  
 Overall Body Height 1.525m  
 Min Body Ground Clearance 0.310m  
 Max Track Width 1.831m  
 Lock to lock time 4.00s  
 Kerb to Kerb Turning Radius 5.900m

REV	DESCRIPTION	DATE	BY	AUTH
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Hub Transport Planning Ltd  
 Floor 1B  
 4 Temple Row  
 Birmingham  
 B2 5HG  
 T : 0121 454 5530

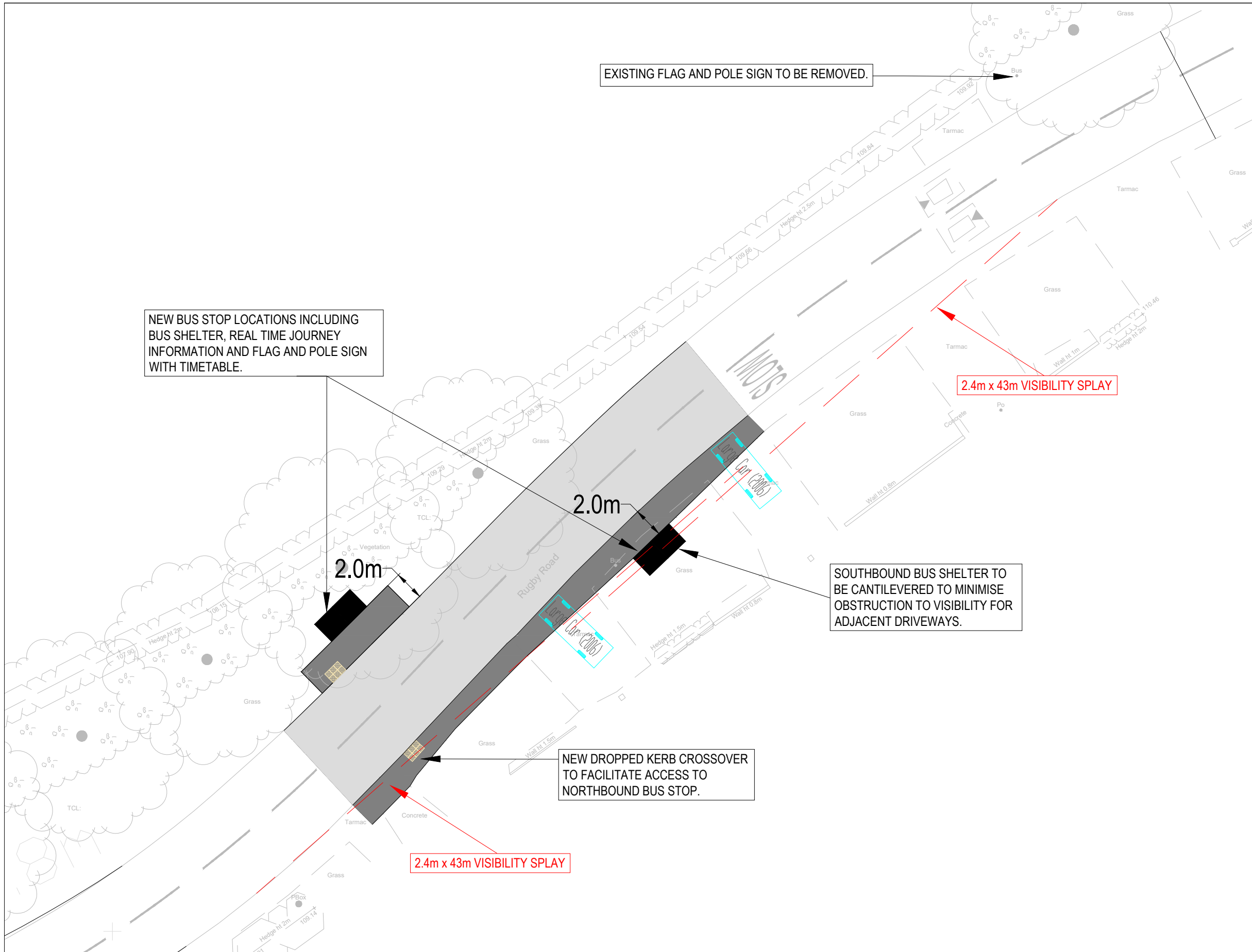
CLIENT  
**RICHBOROUGH**

PROJECT  
**CLIFTON UPON DUNSMORE**

TITLE  
**PROPOSED SHUTTLE SIGNALS AND  
 SWEEP PATH ANALYSIS**

DRAWN	AUTHORISED	SCALE	SHEET SIZE	DATE
MJ	JP	1:500	A3	24.09.25

PROJECT NO.	DRAWING NO.	REV
T25501	003	-



NEW BUS STOP LOCATIONS INCLUDING BUS SHELTER, REAL TIME JOURNEY INFORMATION AND FLAG AND POLE SIGN WITH TIMETABLE.

EXISTING FLAG AND POLE SIGN TO BE REMOVED.

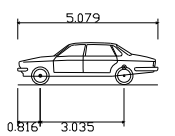
2.4m x 43m VISIBILITY SPLAY

SOUTHBOUND BUS SHELTER TO BE CANTILEVERED TO MINIMISE OBSTRUCTION TO VISIBILITY FOR ADJACENT DRIVEWAYS.

NEW DROPPED KERB CROSSOVER TO FACILITATE ACCESS TO NORTHBOUND BUS STOP.

2.4m x 43m VISIBILITY SPLAY

1. THIS DRAWING IS NOT TO BE SCALED FOR CONSTRUCTION PURPOSES.
2. THE CONTRACTOR SHALL CHECK ALL DIMENSIONS AND LEVELS ON SITE.



Large Car (2006)	5.079m
Overall Length	1.872m
Overall Width	1.525m
Overall Body Height	0.310m
Min Body Ground Clearance	1.831m
Max Track Width	4.00s
Lock to lock time	5.900m
Kerb to Kerb Turning Radius	

REV	DESCRIPTION	DATE	BY	AUTH
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CLIENT  
**RICHBOROUGH**

PROJECT  
**CLIFTON UPON DUNSMORE**

TITLE  
**PROPOSED BUS STOP UPGRADES**

DRAWN MJ	AUTHORISED JP	SCALE 1:250	SHEET SIZE A3	DATE 24.09.25
PROJECT NO. T25501		DRAWING NO. 004		REV -