A1 in Northumberland: Morpeth to Ellingham

Scheme Number: TR010041

6.4 Environmental Statement – Appendix 16.8 Driver Stress Analysis of The Scheme

APFP Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

June 2020

Infrastructure Planning

Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

The A1 in Northumberland: Morpeth to Ellingham

Development Consent Order 20[xx]

Environmental Statement - Appendix

Regulation Reference:	APFP Regulation 5(2)(a)
Planning Inspectorate Scheme Reference	TR010041
Application Document Reference	TR010041/APP/6.4
Author:	A1 in Northumberland: Morpeth to Ellingham Project Team, Highways England

Version	Date	Status of Version
Rev 0	June 2020	Application Issue

CONTENTS

TABLES

1 DRIVER STRESS ANALYSIS OF THE SCHEME

1.1 INTRODUCTION

1.1.1. This appendix presents the Within Topic combined assessment of the likely significant effects of the A1 in Northumberland: Morpeth to Ellingham (the Scheme) on driver stress. The effects of the Scheme on driver stress during construction and operation are considered within this appendix.

1.1.2. Further details of competent expert evidence, legislative and policy framework, methodology and assessment assumption and limitations may also be found in Part A **Chapter 12: Population and Human Health**, **Volume 2** of this ES (**Application Document Reference: TR010041/APP/6.2**) and Part B **Chapter 12: Population and Human Health**, **Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**).

1.2 ASSESSMENT METHODOLOGY

1.2.1. A driver stress assessment has been undertaken for the construction and operation of the Scheme. Forecasted traffic data is not available for the construction period, and therefore a qualitative assessment is undertaken for assessment of driver stress during construction. A quantitative assessment has been undertaken for the assessment of driver stress during operation based on the Scheme traffic data. Further details of the Scheme traffic model can be found in **Chapter 4** of the **Case for the Scheme** (**Application Document Reference: TR010041/APP/7.1**).

1.2.2. The same methodology used for Part A of the Scheme (refer to Part A **Chapter 12: Population and Human Health**, **Volume 2** of this ES (**Application Document Reference: TR010041/APP/6.2**)) and Part B of the Scheme (refer to Part B **Chapter 12: Population and Human Health**, **Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**)) has been used for the Within Topic combined effects assessment.

1.2.3. The driver stress analysis has been undertaken for the opening year (2023) and design year (2038) for two scenarios:

a. Do-minimum (without the Scheme)
b. Do-something (with the Scheme)

1.2.4. The future traffic levels for the assessment of the Scheme are based upon an opening year predicted to be in 2023. Since the assessments reported in this ES were completed, the Scheme opening year has been put back to 2024. The assessment is based on traffic modelling for an opening year of 2023 and reported on that basis. However, as explained in Section 4.1 in **Chapter 4: Environmental Assessment Methodology, Volume 1** of this ES (**Application Document Reference: TR010041/APP6.1**) it is considered that the assessments remain valid for an opening year of 2024.

1.2.5. Flow units for the driver stress are calculated by using the following allocation for vehicle units:

a. A car or light van is one flow unit.
b. A commercial vehicle over 1.5 tonnes or a public service vehicle is three flow units.

1.2.6. The driver stress rating for each link is categorised using either low, moderate or high, as described under the Design Manual for Roads and Bridges (DMRB) guidance in Volume 11, Section 3, Part 9 (**Ref. 1**).

1.2.7. Since the initial preparation of this ES a number of DMRB guidance documents have been superseded and updated with revised guidance. DMRB Volume 11: Section 3: Part 9: Vehicle Travellers (**Ref. 1**) was used in the preparation of this assessment and has since been superseded.

1.2.8. This guidance documents have been replaced by DMRB LA 112 Population and Human Health revision 1 (**Ref. 2**). However, the assessment of driver stress is no longer required under the updated guidance and, therefore, the assessment conforms with DMRB Vol 11: Section 3: Part 9: Vehicle Travellers (**Ref. 1**).

1.3 STUDY AREA

1.3.1. Potential effects on vehicular travellers could be widespread, influenced by changes in traffic flow as well as infrastructure, and not limited to a certain buffer area.

1.3.2. The Scheme Study Area for the operational driver stress assessment is made up of two elements: Scheme Study Area: Part A and Scheme Study Area: Part B. This approach has been taken because of the distance between the two parts of the Scheme. The Scheme Study Area: Part A corresponds to the Study Area defined within Part A, including the extent of the road network within the Order Limits and the additional sections, as shown on Part A **Figure 12.1: Road Sections Assessed for Driver Stress, Volume 5** of this ES (**Application Document Reference: TR010041/APP/6.5**). The Scheme Study Area: Part B corresponds with the Study Area in Part B **Figure 12.1: Assessment Area for Driver Stress, Volume 6** of this ES (**Application Document Reference: TR010041/APP/6.6**).

1.3.3. For the construction period, the Scheme Study Area: Part A consists of the operational Scheme Study Area: Part A. The Scheme Study Area: Part B consists of the operational Scheme Study Area: Part B, and the likely routes to be taken by construction traffic from the Main Compound within the Order Limits of Part A and the Lionheart Enterprise Park Compound to access Part B.

1.3.4. This is in accordance with DMRB Volume 11, Section 3, Part 9 (**Ref. 1**) which requires that speeds and flows are provided for at least one kilometre of a route. The Scheme Study Area includes both the existing A1 and the links from the road network into the existing A1.

1.4 BASELINE CONDITIONS

1.4.1. Baseline conditions for vehicle travellers and the resulting driver stress are outlined within Part A **Chapter 12: Population and Human Health, Volume 2** of this ES (**Application Document Reference: TR010041/APP/6.2**) and Part B **Chapter 12: Population and Human Health, Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**).

1.4.2. The driver stress analysis for the Do-minimum (without the Scheme) are presented within **Table 1-1** and **Table 1-2**. The tables present the predicted average morning and afternoon peak hour driver stress levels along the traffic modelling links, between nodes (sections of the road along which traffic data is collected) within the Scheme extents for opening year (2023) and design year (2038) for the Scheme Study Area.

1.4.3. **Table 1-3** and **Table 1-4** present the summary tables for the Do-minimum scenario for the Scheme Study Area: Part A Study and Scheme Study Area: Part B respectively. The figures show that driver stress for road users would be primarily high or moderate in road sections 1, 2, 3 and 6 through the Scheme Study Area: Part A. The users of the remainder of road sections through the Scheme Study Area: Part A are likely to experience low levels of driver stress. Driver stress would be low for the majority of links between nodes through the Scheme Study Area: Part B, with the exception of those in road section 2, where driver stress would be high.

1.5 POTENTIAL WITHIN TOPIC COMBINED IMPACTS

1.5.1. During construction, there would be some temporary disruption to motorised travellers on the A1 and surrounding road network, particularly on the online widening sections of the Scheme. There may be some temporary increase in driver stress where traffic management and diversions are required. There are some diversions which require vehicular traffic to be rerouted off the A1 onto local roads. This could increase driver stress throughout the duration of the works due to route uncertainty and the diversions onto local roads.

1.5.2. Once in operation, the new arrangement would serve to separate strategic, long-distance traffic from local traffic, reducing driver stress for local journeys and making local journeys safer. It is anticipated that driver stress would be reduced on the existing A1 due to the additional capacity provided by the Scheme which would improve resilience; improve journey times; improve journey time reliability; and improve safety along the route.

1.6 DESIGN, MITIGATION AND ENHANCEMENT MEASURES

DESIGN

1.6.1. The Scheme aims to improve the experience of motorised travellers using the route and connecting roads. Appropriate signage would be implemented to avoid creating route uncertainty.

1.6.2. The provision of grade separated crossings of the Scheme would reduce the fear of accidents for road users.

CONSTRUCTION

1.6.3. The Scheme aims to improve the experience of motorised travellers using the route and connecting roads. The following measures would contribute to an improved experience for motorised users:

a. During the construction stage, traffic is anticipated to be managed using speed restrictions and overnight working as outlined in **Chapter 2: The Scheme**, **Volume 1** of this ES (**Application Document Reference: TR010041/APP/6.1**).

b. Signage and layout would be clear to avoid creating route uncertainty. Any diversions or closures undertaken during construction would be clearly advertised, and any diversionary routes would be clearly signposted and not lead to uncertainty. Details of and traffic management measures are listed within the **Construction Traffic Management Plan** (**Application Document Reference: TR010041/APP/7.4**).

1.7 ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

CONSTRUCTION

1.7.1. It is assumed that during construction, driver stress would be high for vehicle travellers along the A1, as traffic diversions and construction works would likely cause increased user confusion and disruption on the road network in the Scheme Study Area: Part A and Scheme Study Area: Part B.

1.7.1. Therefore, there is likely to be an overall increase to the level of driver stress experienced along the A1 within the extents of the Scheme during construction, however implementation of measures set out in the **Construction Traffic Management Plan (Application Document Reference: TR010041/APP/7.4**) would limit effects where possible.

OPERATION

1.7.2. **Table 1-5** and **Table 1-6** outline the predicted average morning and afternoon peak hour driver stress levels for the Do-something scenario along the traffic modelling links, between nodes within the Scheme extents for opening year (2023) and design year (2038) for the Scheme Study Area. The analysis has been based on the Scheme traffic data. Refer to **Chapter 4** of the **Case for the Scheme** (**Application Document Reference: TR010041/APP/7.1**) for further details on the traffic data.

1.7.3. **Table 1-7** and **Table 1-8** present the summary tables for the Do-something scenario for the Scheme Study Area: Part A and Scheme Study Area: Part B respectively**.** According to the criteria within DMRB guidance, the figures show that the level of driver stress would decrease to a larger proportion of moderate than high levels for road section 1, and from moderate to low for road sections 2, 3 and 6 through the Scheme Study Area: Part A. The majority of all other links through the Scheme Study Area: Part A would remain as low.

1.7.4. Driver stress would remain low for the majority of links between nodes through the Scheme Study Area: Part B, with the exception of those in road section 2, where driver stress would

remain as high, and therefore, there is not likely to be a significant change in the driver stress experienced by road users in the locality of the Scheme Study Area: Part B

1.7.5. The analysis demonstrates that there would be a **Slight Beneficial** (**not significant**) effect on driver stress under the 'Do Something' scenario for the opening and design years. This would primarily be due to the decrease in frustration resulting from reductions in the peak hourly flow. However, motorised users would also benefit from a reduction in the fear of potential accidents and route uncertainty.

1.8 MONITORING

1.8.1. It is not anticipated that any specific monitoring would be carried out.

Table 1-1 – Scheme Study Area: Part A, Do Minimum (2023 and 2038)

		2023 Do Minimum						2038 Do Minimum					
Link ID	Road Section	Average AM peak hourly flow / lane	AM peak average speed (kmph)	AM peak driver stress	Average PM peak hourly flow / lane	PM peak average speed (kmph)	PM peak driver stress	Average AM peak hourly flow / lane	AM peak average speed (kmph)	AM peak driver stress	Average PM peak hourly flow / lane	PM peak average speed (kmph)	PM peak driver stress
1941-1951	1	854.8	111.4	Low	814.2	110.8	Low	1022.5	110.4	Low	918.8	110.3	Low
1951_1985	1	854.8	70.2	Moderate	814.2	67.1	Moderate	1022.5	63.3	Moderate	918.8	62.1	Moderate
1985-1951	1	888.1	69.5	High	762.6	71.6	Moderate	935.3	67.2	High	918.6	64.5	High
1985-1990	1	888.7	62.2	Moderate	871.2	55.8	High	1050.0	57.2	High	986.7	49.9	High
1990-1985	1	896.15	68.3	Moderate	779.9	67.9	Moderate	942.9	66.1	Moderate	936.7	61.3	Moderate
1990-2059	1	874.8	69.5	Moderate	785.4	68.3	Moderate	1042.0	62.7	Moderate	875.9	63.9	Moderate
2059-1990	1	902.6	68.9	Moderate	775.7	71	Moderate	930.1	67.4	Moderate	911.4	64.8	Moderate
2061 2059	1	908.2	68.7	High	781.4	70.7	Moderate	936.2	67.1	High	917.7	64.5	High
2059 2061	1	887.8	69.0	High	800.3	67.6	High	1055.6	62.2	High	890.9	63.3	High
2061-27047	1	887.3	69.0	High	802.8	67.5	High	1054.9	62.2	High	893.3	63.1	High
27047-2061	1	908.0	68.7	Moderate	784.0	70.5	Moderate	936.1	67.1	Moderate	920.4	64.3	Moderate
2076-27047	1	879.6	69.7	High	792.7	69.7	Moderate	906.6	68.2	High	928.1	63.6	High
27047-2076	1	873.2	69.4	High	786.3	68.2	Moderate	1039.8	62.8	High	876.5	63.9	High
2076-2099	1	867.9	69.8	High	785.0	68.4	Moderate	1043.8	62.7	High	881.7	63.7	High
2099-2076	1	872.3	70.1	High	797.5	69.9	Moderate	910.8	68.1	High	939.7	63.5	High
2107-2100	1	816.1	72.6	High	759.3	71.7	Moderate	861.6	70.4	High	904.8	65.1	High
2100-2107	1	854.3	70.5	High	804.1	67.6	High	1028.2	63.4	High	902.8	62.8	High
2107 -2040	1	848.8	70.5	Moderate	785.9	68.3	Moderate	1020.9	63.6	Moderate	882.0	63.7	Moderate
2040 -2107	1	809.9	72.9	Moderate	755.2	71.9	Moderate	854.8	70.7	Moderate	900.0	65.3	Moderate
1841 -1937	1	832.4	72.0	Moderate	764.7	71.3	Moderate	854.5	70.7	Moderate	895.4	65.6	Moderate

		2023 Do Minimum						2038 Do Minimum					
Link ID	Road Section	Average AM peak hourly flow / lane	AM peak average speed (kmph)	AM peak driver stress	Average PM peak hourly flow / lane	PM peak average speed (kmph)	PM peak driver stress	Average AM peak hourly flow / lane	AM peak average speed (kmph)	AM peak driver stress	Average PM peak hourly flow / lane	PM peak average speed (kmph)	PM peak driver stress
1937 -1841	1	857.0	70.4	High	799.4	67.8	Moderate	1007.5	64.2	High	879.8	63.9	High
1841 - 27045	1	857.2	79.4	High	793.2	77.6	Moderate	1007.6	74.4	High	874.0	74.4	High
27045-1841	1	832.2	80.6	Low	768.4	79.8	Moderate	854.3	79.6	Moderate	900.1	75.3	Moderate
1807-27045	1	794.3	81.5	Moderate	715.2	81.2	Moderate	816.1	80.5	High	844.7	76.9	High
27045 - 1807	1	848.1	79.7	Moderate	772.9	78.3	Moderate	998.3	74.8	Moderate	855.6	75.1	Moderate
1802-27043	1	834.0	80.2	High	709.2	81.1	Moderate	1019.5	74.3	High	811.3	77.3	High
27043-1802	1	764.3	82.6	Moderate	710.3	81.8	Moderate	814.9	80.5	High	866.8	76.0	High
1829-27043	1	764.3	82.7	Moderate	710.3	82.1	Moderate	814.9	80.9	High	866.8	76.6	High
27043-1829	1	834.0	80.2	Low	709.2	81.1	Low	1019.5	74.3	Moderate	811.3	77.3	Moderate
1829 -1855	1	834.0	111.3	Low	709.2	111.2	Low	1019.5	110.5	Low	811.3	110.8	Low
1985-1858	2	7.9	74.4	Moderate	17.2	74.1	Moderate	7.6	73.8	Moderate	18.0	73.5	Moderate
1858-1985	2	33.8	72.8	Moderate	57.0	72.1	Moderate	27.5	71.6	Moderate	67.8	70.9	Moderate
1990-2185	3	93.0	81.8	Low	116.3	81.5	Low	90.7	81.8	Low	143.2	81.3	Low
2185-1990	3	72.5	69.5	Moderate	34.6	71.9	Low	95.5	67.9	Moderate	57.7	70.8	Low
2344-2059	4	13.0	73.5	Low	14.9	73.6	Low	13.6	71.9	Low	14.9	71.6	Low
2059-2344	4	5.6	81.9	Low	5.6	81.9	Low	6.0	81.9	Low	6.2	82	Low
1725 2061	5	1.6	76.5	Low	3.4	77.8	Low	1.3	75.4	Low	3.2	77.2	Low
2061-1725	5	1.9	79.2	Low	3.5	79.1	Low	1.9	79.0	Low	3.5	78.9	Low
2313-2076	6	17.2	59.4	Moderate	10.4	58.8	Moderate	4.3	56.6	Moderate	5.1	55.7	Moderate
2076-2313	6	15.2	63.9	Moderate	16.5	63.9	Moderate	4.6	64	Moderate	11.6	63.9	Moderate
2117-2353	7	47.5	81.9	Low	85.6	81.7	Low	52.9	81.9	Low	88.9	81.7	Low
2353-2117	7	90.1	81.8	Low	143.0	81.4	Low	86.6	81.8	Low	144.9	81.3	Low

		2023 Do Minimum						2038 Do Minimum					
Link ID	Road Section	Average AM peak hourly flow / lane	AM peak average speed (kmph)	AM peak driver stress	Average PM peak hourly flow / lane	PM peak average speed (kmph)	PM peak driver stress	Average AM peak hourly flow / lane	AM peak average speed (kmph)	AM peak driver stress	Average PM peak hourly flow / lane	PM peak average speed (kmph)	PM peak driver stress
2353 2451	7	50.4	77.7	Low	89.0	77.3	Low	55.9	77.5	Low	92.7	77.0	Low
2451 2353	7	95.7	81.7	Low	148.6	81.3	Low	92.4	81.7	Low	153.0	81.3	Low
2107 1662	8	5.4	80.7	Low	18.2	80.7	Low	7.3	80.7	Low	20.8	80.7	Low
1662 2107	8	6.2	78.7	Low	4.0	78.5	Low	6.8	78.0	Low	4.7	77.5	Low
2417-2040	9	13.9	79.5	Low	16.3	79.5	Low	15.2	79.4	Low	15.6	79.0	Low
2040-2417	9	20.6	80.2	Low	9.5	80.2	Low	17.3	80.1	Low	8.6	80.1	Low
1662 1933	10	28.9	81.9	Low	23.0	81.9	Low	3.9	82	Low	6.0	82	Low
1933-1662	10	36.4	81.9	Low	25.8	81.9	Low	15.0	82	Low	10.5	82	Low
1662-1640	10	41.8	69.9	Moderate	44.0	69.4	Moderate	22.3	69.2	Moderate	31.3	68.8	Moderate
1640-1662	10	35.1	80.0	Low	27.1	80.0	Low	10.7	75.4	Moderate	10.8	77.3	Moderate
1659-1841	11	1.9	77.5	Low	2.9	76.8	Low	1.5	76.6	Low	1.9	76.2	Low
1841-1659	11	1.5	82	Low	12.8	82	Low	1.2	82	Low	12.4	82	Low
1659-1802	12	79.4	78.7	Low	20.2	78.4	Low	118.9	78.1	Low	40.1	78.2	Low
1802-1659	12	20.0	80.0	Low	46.6	80.0	Low	51.0	80.0	Low	80.3	79.8	Low
1821-1970	13	93.4	81.6	Low	83.9	81.5	Low	97.7	81.5	Low	84.6	81.4	Low
1970-1821	13	50.0	81.9	Low	51.5	81.9	Low	52.1	81.9	Low	58.3	81.8	Low
27042-2018	14	62.1	85.1	Low	60.9	85.0	Low	63.4	84.9	Low	69.4	84.8	Low
2018 - 27042	14	66.9	87.9	Low	49.8	87.9	Low	79.5	87.9	Low	53.0	87.9	Low

Table 1-2 – Scheme Study Area: Part B, Do Minimum (2023 and 2038)

		2023 Do Minimum						2038 Do Minimum					
Link ID	Road Section	Average AM peak hourly flow / lane	AM peak average speed (kmph)	AM peak driver stress	Average PM peak hourly flow / lane	PM peak average speed (kmph)	PM peak driver stress	Average AM peak hourly flow / lane	AM peak average speed (kmph)	AM peak driver stress	Average PM peak hourly flow / lane	PM peak average speed (kmph)	PM peak driver stress
1748_1722	1	517.3	111.7	Low	517.3	111.6	Low	700.8	111.4	Low	628.8	111.4	Low
1748_1744	1	5.5	64	Moderate	4.3	64	Moderate	5.8	64	Moderate	4.3	64	Moderate
1749_1748	1	514.3	111.7	Low	514.5	111.6	Low	697.8	111.4	Low	626.1	111.4	Low
1753_1749	1	515.1	111.7	Low	515.1	111.6	Low	698.5	111.4	Low	626.6	111.4	Low
1887_1753	1	515.1	84.0	Low	515.1	82.9	Low	698.5	76.9	Moderate	626.6	77.9	Moderate
1888_1887	1	545.1	65.8	Moderate	569.1	52.5	High	731.8	62.6	Moderate	685.6	50.4	High
1901_1888	1	529.6	83.5	Low	555.2	81.2	Low	712.8	76.4	Moderate	669.8	76.0	Moderate
1890_1888	1	46.1	23.8	High	61.8	22.6	High	48.4	22.2	High	66.0	20.8	High
1887_1890	1	34.8	88	Low	65.1	88	Low	38.1	88	Low	71.9	88	Low
1899_1897	1	108.4	54.2	Moderate	108.3	40.1	High	114.5	50.5	Moderate	118.5	38.5	High
1902_1899	1	108.4	88	Low	108.3	88	Low	114.5	88	Low	118.5	88	Low
1902_1901	1	407.2	87.8	Low	390.6	88.2	Low	559.1	82.9	Low	481.1	84.7	Low
1899_1901	1	122.4	21.6	High	164.5	21.6	High	153.7	20.1	High	188.6	20.4	High
2231_1902	1	407.2	87.8	Low	390.6	88.2	Low	559.1	82.9	Low	481.1	84.7	Low
2309_2238	1	384.9	111.9	Low	568.6	111.6	Low	441.4	111.8	Low	712.2	111.3	Low
2231_2274	1	294.3	111.9	Low	434.1	111.8	Low	344.0	111.9	Low	537.4	111.6	Low
2274_2278	1	213.5	111.9	Low	345.8	111.9	Low	250.6	111.9	Low	432.5	111.8	Low
2288_2285	1	307.4	22	High	292.0	27.2	High	368.8	20.1	High	334.8	25.6	High
2310_2288	1	317.1	88	Low	300.2	88	Low	367.5	88	Low	341.4	88	Low
2278_2309	1	384.9	111.9	Low	568.6	111.6	Low	441.4	111.8	Low	712.2	111.3	Low
4658_4646	1	511.0	111.1	Low	487.2	111.2	Low	696.5	110.8	Moderate	596.7	111.1	Low
4664_4658	1	511.0	111.7	Low	487.2	111.7	Low	696.5	111.4	Moderate	596.7	111.5	Low
1722_4664	1	517.3	111.7	Low	517.3	111.6	Low	700.8	111.4	Low	628.8	111.4	Low

		2023 Do Minimum						2038 Do Minimum					
Link ID	Road Section	Average AM peak hourly flow / lane	AM peak average speed (kmph)	AM peak driver stress	Average PM peak hourly flow / lane	PM peak average speed (kmph)	PM peak driver stress	Average AM peak hourly flow / lane	AM peak average speed (kmph)	AM peak driver stress	Average PM peak hourly flow / lane	PM peak average speed (kmph)	PM peak driver stress
1744_1748	1	3.1	20.0	High	3.2	19.8	High	3.2	18.8	High	3.2	19.0	High
1887_1888	1	372.2	89.6	Low	494.5	84.4	Low	429.1	87.7	Low	605.8	79.7	Moderate
1897_1899	1	122.4	88	Low	164.5	88	Low	153.7	88	Low	188.6	88	Low
1888_1901	1	402.8	88.6	Low	542.4	88.2	Low	458.6	86.7	Low	656.0	77.2	Moderate
2285_2288	1	349.5	30.0	High	452.8	27.2	High	390.0	30.6	High	523.3	25.6	High
2288_2310	1	371.3	84.7	Low	426.1	81.4	Low	425.1	83.5	Low	480.8	79.4	Low
4646_4658	1	383.5	111.8	Low	482.8	111.7	Low	440.9	111.8	Low	590.6	111.5	Low
1901_1902	1	402.8	34.1	High	542.4	36.4	High	458.6	33.5	High	656.0	35.9	High
1902_2231	1	294.3	91.7	Low	434.1	86.9	Low	344.0	90.3	Low	537.4	82.9	Low
2119_2111	2	136.3	23.2	High	85.7	23.2	High	175.8	23.1	High	101.5	23.1	High
2189_2116	2	521.6	47	High	529.5	47	High	607.5	47	High	579.3	47	High
27035_2200	2	256.4	43.0	High	204.0	43.0	High	293.6	42.6	High	222.2	42.7	High
27035_2340	2	165.6	43.9	High	265.2	42.1	High	185.0	43.6	High	296.6	41.6	High
2116_2189	2	407.8	47	High	488.1	47	High	449.9	47	High	544.5	47	High
2340_27035	2	256.4	43.1	High	204.0	43.0	High	293.6	42.7	High	222.2	42.7	High
2200_27035	2	165.6	44.0	High	265.2	42.1	High	185.0	43.7	High	296.6	41.6	High
2025_1897	3	105.7	63.7	Moderate	140.1	63.3	Moderate	135.7	63.4	Moderate	162.3	63.0	Moderate
2047_2025	3	62.0	87.9	Low	100.4	87.7	Low	89.5	87.8	Low	122.2	87.6	Low
2093_2047	3	134.4	87.6	Low	151.8	87.4	Low	183.6	87.2	Low	181.0	87.1	Low
2101_2108	3	193.2	88	Low	181.8	88	Low	209.0	88	Low	218.7	88	Low
2285_2119	3	136.3	88	Low	85.7	88	Low	175.8	88	Low	101.5	88	Low
2047_2093	3	163.2	87.5	Low	147.7	87.4	Low	173.3	87.4	Low	179.9	87.1	Low
2119_2285	3	124.3	82.5	Low	124.9	81.9	Low	137.7	82.4	Low	155.7	81.5	Low
2346_2310	4	393.1	77.8	Low	394.7	73.8	Low	451.5	76.6	Low	461.3	71.3	Low

		2023 Do Minimum						2038 Do Minimum					
Link ID	Road Section	Average AM peak hourly flow / lane	AM peak average speed (kmph)	AM peak driver stress	Average PM peak hourly flow / lane	PM peak average speed (kmph)	PM peak driver stress	Average AM peak hourly flow / lane	AM peak average speed (kmph)	AM peak driver stress	Average PM peak hourly flow / lane	PM peak average speed (kmph)	PM peak driver stress
1890_2037	4	34.8	86.1	Low	65.1	86.2	Low	38.16	86.2	Low	71.9	86.1	Low
2310_2346	4	356.8	81.6	Low	386.1	80.6	Low	411.6	80.5	Low	426.0	79.0	Low
1897_1648	5	13.1	86.6	Low	24.5	86.6	Low	16.4	86.6	Low	28.6	86.6	Low
1744_1233	6	6.2	81.5	Low	4.8	81.5	Low	6.6	81.5	Low	4.8	81.5	Low
4665_1755	7	59.2	77.8	Low	43.3	79.7	Low	68.3	77.9	Low	46.4	79.6	Low
1818_1755	7	23.6	81.9	Low	36.5	81.9	Low	25.8	81.9	Low	42.9	81.9	Low
2163_1755	7	28.0	80.1	Low	3.2	80.1	Low	37.0	80.1	Low	3.5	80.1	Low
27003_1818	7	25.9	76.4	Low	37.1	76.4	Low	28.3	76.4	Low	43.3	76.4	Low
4695_1818	7	7.9	78.8	Low	4.4	79.9	Low	8.1	78.8	Low	4.3	79.9	Low
4657_4646	7	45.1	75.7	Moderate	41.1	75.5	Moderate	47.0	75.0	Moderate	37.8	74.9	Moderate
1755_1818	7	32.1	81.9	Low	32.8	81.9	Low	38.7	81.9	Low	35.0	81.9	Low
1755_2163	7	27.0	80.1	Low	10.4	80.1	Low	29.6	80.1	Low	11.4	80.1	Low
4646_4657	7	46.7	81.9	Low	36.7	81.9	Low	59.4	81.9	Low	41.8	81.9	Low
1755_4665	7	51.6	72.6	Moderate	39.8	71.9	Moderate	62.8	72.3	Moderate	46.4	71.4	Moderate
1818_4695	7	5.4	64	Moderate	3.9	64	Moderate	5.6	64	Moderate	3.8	64	Moderate
1818_27003	7	36.9	76.4	High	33.9	76.4	High	43.7	76.4	High	36.0	76.4	High
1753_1887	1	376.9	89.4	Low	505.6	83.8	Low	434.0	87.6	Low	618.9	79.0	Low
1897_2025	3	95.3	63.5	Moderate	83.7	63.5	Moderate	98.1	63.5	Moderate	89.8	63.5	Moderate
2025_2047	3	82.2	87.9	Low	67.8	87.9	Low	87.7	87.8	Moderate	78.2	87.8	Low
2037_1890	4	46.1	87.9	Low	61.8	87.9	Low	48.4	87.9	Low	66.0	87.9	Moderate
1648_1897	5	16.6	86.6	Low	24.4	86.6	Low	17.8	86.6	Low	26.3	86.5	Low
1233_1744	6	3.1	82	Low	3.28	82	Low	3.2	82	Low	3.2	82	Low

Table 1-3 – 'Do Minimum' Driver Stress Summary for Scheme Study Area: Part A

Road Section	'Do Minimum' 2023 AM Peak	'Do Minimum' 2023 PM Peak	'Do Minimum' 2038 AM Peak	'Do Minimum' 2038 PM Peak
1	4 nodes low 13 nodes moderate 13 nodes high Overall high driver stress for this section	3 nodes low 23 nodes moderate 4 nodes high Overall moderate driver stress for this section	2 nodes low 11 nodes moderate 17 nodes high Overall high driver stress for this section	2 nodes low 11 nodes moderate 17 nodes high Overall high driver stress for this section
2	2 nodes moderate Overall moderate driver stress for this section	2 nodes moderate Overall moderate driver stress for this section	2 nodes moderate Overall moderate driver stress for this section	2 nodes moderate Overall moderate driver stress for this section
3	1 node low 1 node moderate Overall moderate driver stress for this section	2 nodes low Overall low driver stress for this section	1 node low 1 node moderate Overall moderate driver stress for this section	2 nodes low Overall low driver stress for this section
4	2 nodes low Overall low driver stress for this section	2 nodes low Overall low driver stress for this section	2 nodes low Overall low driver stress for this section	2 nodes low Overall low driver stress for this section
5	2 nodes low Overall low driver stress for this section	2 nodes low Overall low driver stress for this section	2 nodes low Overall low driver stress for this section	2 nodes low Overall low driver stress for this section
6	2 nodes moderate Overall moderate driver stress for this section	2 nodes moderate Overall moderate driver stress for this section	2 nodes moderate Overall moderate driver stress for this section	2 nodes moderate Overall moderate driver stress for this section
7	4 nodes low Overall low driver stress for this section	4 nodes low Overall low driver stress for this section	4 nodes low Overall low driver stress for this section	4 nodes low Overall low driver stress for this section
8	2 nodes low Overall low driver stress for this section	2 nodes low Overall low driver stress for this section	2 nodes low Overall low driver stress for this section	2 nodes low Overall low driver stress for this section
9	2 nodes low Overall low driver stress for this section	2 nodes low Overall low driver stress for this section	2 nodes low Overall low driver stress for this section	2 nodes low Overall low driver stress for this section
10	3 nodes low 1 node moderate Overall low driver stress for this section	3 nodes low 1 node moderate Overall low driver stress for this section	2 nodes low 2 nodes moderate Overall moderate driver stress for this section	2 nodes low 2 nodes moderate Overall moderate driver stress for this section
11	2 nodes low Overall low driver stress for this section	2 nodes low Overall low driver stress for this section	2 nodes low Overall low driver stress for this section	2 nodes low Overall low driver stress for this section
12	2 nodes low	2 nodes low	2 nodes low	2 nodes low

	Overall low driver stress for this section	Overall low driver stress for this section	Overall low driver stress for this section	Overall low driver stress for this section
13	2 nodes low Overall low driver stress for this section	2 nodes low Overall low driver stress for this section	2 nodes low Overall low driver stress for this section	2 nodes low Overall low driver stress for this section
14	2 nodes low Overall low driver stress for this section	2 nodes low Overall low driver stress for this section	2 nodes low Overall low driver stress for this section	2 nodes low Overall low driver stress for this section

Table 1-4 – 'Do Minimum' Driver Stress Summary for Scheme Study Area: Part B

Road Section	'Do Minimum' 2023 AM Peak	'Do Minimum' 2023 PM Peak	'Do Minimum' 2038 AM Peak	'Do Minimum' 2038 PM Peak
1	24 nodes low 3 nodes moderate 6 nodes high Overall low driver stress for this section	24 nodes low 1 node moderate 8 nodes high Overall low driver stress for this section	20 nodes low 7 nodes moderate 6 nodes high Overall low driver stress for this section	20 nodes low 5 nodes moderate 8 nodes high Overall low driver stress for this section
2	7 nodes high Overall high driver stress for this section	7 nodes high Overall high driver stress for this section	7 nodes high Overall high driver stress for this section	7 nodes high Overall high driver stress for this section
3	7 nodes low 2 nodes moderate Overall low driver stress for this section	7 nodes low 2 nodes moderate Overall low driver stress for this section	6 nodes low 3 nodes moderate Overall low driver stress for this section	7 nodes low 2 nodes moderate Overall low driver stress for this section
4	4 nodes low Overall low driver stress for this section	4 nodes low Overall low driver stress for this section	4 nodes low Overall low driver stress for this section	4 nodes low 1 node moderate Overall low driver stress for this section
5	2 nodes low Overall low driver stress for this section	2 nodes low Overall low driver stress for this section	2 nodes low Overall low driver stress for this section	2 nodes low Overall low driver stress for this section
6	2 nodes low Overall low driver stress for this section	2 nodes low Overall low driver stress for this section	2 nodes low Overall low driver stress for this section	2 nodes low Overall low driver stress for this section
7	8 nodes low 3 nodes moderate 1 node high Overall low driver stress for this section	8 nodes low 3 nodes moderate 1 node high Overall low driver stress for this section	8 nodes low 3 nodes moderate 1 node high Overall low driver stress for this section	8 nodes low 3 nodes moderate 1 node high Overall low driver stress for this section

Table 1-5 – Scheme Study Area: Part A, Do Something (2023 and 2038)

Link ID	Road Section	2023 Do Something						2038 Do Something					
		Average AM peak hourly flow / lane	AM peak average speed (kmph)	AM peak driver stress	Average PM peak hourly flow / lane	PM peak average speed (kmph)	PM peak driver stress	Average AM peak hourly flow / lane	AM peak average speed (kmph)	AM peak driver stress	Average PM peak hourly flow / lane	PM peak average speed (kmph)	PM peak driver stress
1941- 1951	1	1442.4	109.7	Moderate	1315.9	109.2	Moderate	1877.2	107.3	High	1586.2	107.3	Moderate
1951- 1985	1	1442.4	109.7	Moderate	1315.9	109.2	Moderate	1877.2	107.3	High	1586.2	107.3	Moderate
1985- 40011	1	1567.0	109.0	Moderate	1351.4	108.9	Moderate	2064.8	105.9	High	1620.0	107.0	High
1725-40009	1	0.02	79.6	Low	0.04	79.6	Low	0.01	79.6	Low	0.04	79.5	Low
40009-35152	1	9.0	47.5	High	5.9	47.5	High	10.3	46.01	High	6.5	46.6	High
40011-35152	1	1567.0	109.0	Moderate	1351.4	108.9	Moderate	2064.8	105.9	High	1620.0	107.0	High
40010-35153	1	153.6	48.0	High	120.7	48.1	High	182.0	47.5	High	165.2	46.9	High
40010-2061	1	86.9	74.7	Low	71.4	74.7	Low	100.3	74.6	Low	99.1	74.6	Low
35152-27160	1	1475.4	109.5	Moderate	1265.5	109.5	Moderate	1960.2	106.7	High	1509.2	107.9	Moderate
27160-29104	1	1475.4	109.5	Moderate	1265.5	109.5	Moderate	1960.2	106.7	High	1509.2	107.9	Moderate
29104-40015	1	1475.4	109.5	Moderate	1265.5	109.5	Moderate	1960.2	106.7	High	1509.2	107.9	Moderate
40017-27045	1	1475.4	109.5	Moderate	1265.5	109.5	Moderate	1960.2	106.7	High	1509.2	107.9	Moderate
1802-27166	1	126.9	52.8	Moderate	139.5	55.2	Moderate	140.2	52.0	Moderate	147.8	54.7	Moderate
27045-1802	1	1475.4	109.5	Moderate	1265.5	109.5	Moderate	1960.2	106.7	High	1509.2	107.9	Moderate
27166-27167	1	155.4	81.5	Low	174.4	81.2	Low	170.1	81.4	Low	189.9	81.0	Low
1858- 35147	2	46.8	75.2	Low	72.3	75.3	Low	52.7	75.1	Low	84.4	75.2	Low
35147- 1858	2	27.1	74.2	Low	30.9	73.9	Low	21.1	74.0	Low	37.3	73.9	Low
27419-35147	2	167.9	75.7	Low	87.9	70.4	Low	226.1	77.6	Low	103.9	70.0	Low
35147- 27149	2	62.9	81.9	Low	94.0	81.7	Low	70.0	81.9	Low	117.1	81.6	Low
1985- 35147	2	38.5	81.9	Low	35.2	81.9	Low	42.3	81.9	Low	47.3	81.9	Low

Link ID	Road Section	2023 Do Something						2038 Do Something					
		Average AM peak hourly flow / lane	AM peak average speed (kmph)	AM peak driver stress	Average PM peak hourly flow / lane	PM peak average speed (kmph)	PM peak driver stress	Average AM peak hourly flow / lane	AM peak average speed (kmph)	AM peak driver stress	Average PM peak hourly flow / lane	PM peak average speed (kmph)	PM peak driver stress
35147- 1985	2	163.1	43.4	High	70.5	43.0	High	230.0	41.5	High	81.1	41.8	High
27148- 1990	3	15.9	49.3	High	21.3	49.6	High	41.8	48.9	High	35.5	48.6	High
1990- 27148	3	70.1	81.9	Low	123.9	81.5	Low	97.8	81.8	Low	167.0	81.2	Low
27148- 2185	3	128.9	81.6	Low	206.3	80.8	Low	163.9	81.4	Low	271.3	79.9	Low
2185- 27148	3	179.6	76.0	Low	97.6	77	Low	263.9	75.6	Low	126.6	77.0	Low
2061-2059	4	1.5	96	Low	0.2	96	Low	1.8	96	Low	4.2	96	Low
2059-2061	4	11.7	96	Low	8.1	96	Low	13.9	95.9	Low	8.1	96	Low
2059-2344	4	1.5	81.9	Low	0.2	81.9	Low	1.8	82	Low	4.2	82	Low
2344-2059	4	11.7	82	Low	8.1	82	Low	13.9	82	Low	8.1	82	Low
40010-2061	5	86.9	74.7	Low	71.4	74.7	Low	100.3	74.6	Low	99.1	74.6	Low
2061-40010	5	133.6	87.7	Low	126.1	87.6	Low	162.8	87.6	Low	169.6	87.3	Low
40010-40009	5	18.6	88	Low	33.9	87.9	Low	18.5	88	Low	35.6	87.9	Low
40009-40010	5	120.7	69.9	Moderate	84.8	69.8	Moderate	133.8	69.7	Moderate	110.6	69.4	Moderate
40009-35152	5	9.0	47.5	High	5.9	47.5	High	10.3	46.0	High	6.5	46.6	High
35152-40009	5	100.6	78.5	Low	91.8	73.9	Low	114.9	78.8	Low	117.3	75.6	Low
1725-40009	5	0.02	79.6	Low	0.04	79.6	Low	0.01	79.6	Low	0.0	79.5	Low
40009-1725	5	0.86	79.3	Low	0.1	79.2	Low	0.2	79.2	Low	0.1	79.2	Low
2076- 2313	6	20.1	78.0	Low	30.1	78.0	Low	20.2	78.0	Low	32.5	78.0	Low
2313- 2076	6	26.0	77.8	Low	13.3	77.8	Low	25.5	77.8	Low	16.2	77.7	Low
2117- 2353	7	59.9	81.9	Low	50.3	81.9	Low	68.5	81.9	Low	68.4	81.8	Low
2353- 2117	7	98.0	81.8	Low	124.9	81.5	Low	124.9	81.5	Low	165.0	81.2	Low

Link ID	Road Section	2023 Do Something						2038 Do Something					
		Average AM peak hourly flow / lane	AM peak average speed (kmph)	AM peak driver stress	Average PM peak hourly flow / lane	PM peak average speed (kmph)	PM peak driver stress	Average AM peak hourly flow / lane	AM peak average speed (kmph)	AM peak driver stress	Average PM peak hourly flow / lane	PM peak average speed (kmph)	PM peak driver stress
2353-2451	7	62.6	77.9	Low	53.6	77.8	Low	71.3	77.8	Low	72.2	77.7	Low
2451-2353	7	103.2	81.8	Low	129.9	81.5	Low	134.4	81.6	Low	170.1	81.1	Low
2107-1662	8	5.4	80.7	Low	21.3	80.7	Low	7.9	80.7	Low	22.8	80.7	Low
1662-2107	8	7.2	80.7	Low	5.8	80.7	Low	7.6	80.7	Low	4.8	80.7	Low
2417- 2040	9	12.3	80.4	Low	14.1	80.3	Low	14.4	80.4	Low	19.0	80.3	Low
2040- 2417	9	20.0	80.2	Low	16.6	80.2	Low	23.9	80.2	Low	20.0	80.2	Low
1662-1933	10	2.7	82	Low	4.1	82	Low	2.4	82	Low	3.7	82	Low
1933- 1662	10	7.2	82	Low	9.6	82	Low	6.8	82	Low	11.8	82	Low
1662- 1640	10	12.7	70.6	Low	31.0	70.2	Low	14.7	70.3	Low	34.6	70.1	Low
1640- 1662	10	10.0	74.5	Moderate	10.0	75.9	Moderate	10.0	74.3	Moderate	8.5	76.0	Moderate
1659- 1841	11	1.4	82	Low	1.5	82	Low	1.1	82	Low	1.4	82	Low
1841- 1659	11	0.8	82	Low	5.5	82	Low	0.7	82	Low	5.6	82	Low
1659- 27166	12	81.8	81.8	Low	24.1	81.9	Low	91.4	81.8	Low	26.3	81.9	Low
27166- 1659	12	12.4	80.0	Low	33.1	79.9	Low	12.7	80.0	Low	37.8	79.9	Low
27165- 1970	13	111.5	81.5	Low	116.0	81.4	Low	125.4	81.4	Low	124.8	81.3	Low
1970- 27165	13	64.8	81.5	Low	64.9	81.1	Low	68.8	81.4	Low	75.6	81.1	Low
2018- 27042	14	74.4	87.9	Low	57.4	87.9	Low	89.1	87.9	Low	65.4	87.9	Low
27042-2018	14	63.5	85.2	Low	67.7	85.1	Low	65.2	85.2	Low	77.0	85.1	Low

Table 1-6 – Scheme Study Area: Part B, Do Something (2023 and 2038)

Link ID	Road Section	2023 Do Something						2038 Do Something					
		Average AM peak hourly flow / lane	AM peak average speed (kmph)	AM peak driver stress	Average PM peak hourly flow / lane	PM peak average speed (kmph)	PM peak driver stress	Average AM peak hourly flow / lane	AM peak average speed (kmph)	AM peak driver stress	Average PM peak hourly flow / lane	PM peak average speed (kmph)	PM peak driver stress
1748_1722	1	833.3	111.5	Low	670.0	111.5	Low	1135.6	110.8	Low	816.7	111.2	Low
1748_1744	1	6.2	64	Moderate	4.2	64	Moderate	6.6	64	Moderate	4.1	64	Moderate
1749_1748	1	829.4	111.5	Low	667.1	111.5	Low	1131.5	110.8	Low	814.0	111.21	Low
1753_1749	1	829.4	111.5	Low	667.1	111.5	Low	1131.6	110.8	Low	814.0	111.21	Low
1899_1897	1	37.6	70.7	Low	41.9	70.5	Low	40.2	70.6	Low	42.7	70.45	Low
1902_1901	1	725.9	111.6	Low	540.3	111.7	Low	1009.3	111.1	Low	666.8	111.55	Low
2231_1902	1	725.9	111.6	Low	540.3	111.7	Low	1009.3	111.1	Low	666.8	111.55	Low
2309_2238	1	559.7	111.8	Low	696.5	111.4	Low	670.7	111.7	Low	900.0	110.94	Low
2274_2278	1	348.5	111.9	Low	423.6	111.8	Low	439.1	111.9	Low	557.1	111.71	Low
2288_2285	1	454.5	18.1	High	416.7	20.6	High	544.9	16.9	High	474.7	19.54	High
2310_2288	1	478.4	88	Low	431.6	88	Low	551.0	88	Low	489.8	88	Low
2278_2309	1	559.7	111.8	Low	696.5	111.4	Low	670.7	111.7	Low	900.0	110.94	Low
4658_4646	1	818.1	111.0	High	622.5	111.1	Moderate	1123.9	110.2	High	769.0	110.69	Moderate
4664_4658	1	818.1	111.5	High	622.5	111.6	Moderate	1123.9	110.8	High	769.0	111.32	Moderate
1722_4664	1	833.3	111.5	Low	670.0	111.5	Low	1135.6	110.8	Low	816.7	111.2	Low
1744_1748	1	4.2	20.4	High	3.8	20.5	High	4.4	18.2	High	3.6	19.31	High
1887_1888	1	538.4	111.8	Low	595.0	111.6	Low	660.4	111.7	Low	789.9	111.25	Low
1897_1899	1	15.5	71.1	Low	30.1	71.0	Low	16.8	71.1	Low	31.6	71.01	Low
2285_2288	1	444.9	28.4	High	569.3	25.4	High	509.2	25.7	High	668.7	23.96	High
2288_2310	1	466.7	84.0	Low	539.4	80.3	Low	546.4	82.3	Low	625.8	77.56	Moderate
4646_4658	1	539.9	111.8	Low	565.2	111.7	Low	649.0	111.7	Moderate	709.5	111.44	Moderate

Link ID	Road Section	2023 Do Something						2038 Do Something					
		Average AM peak hourly flow / lane	AM peak average speed (kmph)	AM peak driver stress	Average PM peak hourly flow / lane	PM peak average speed (kmph)	PM peak driver stress	Average AM peak hourly flow / lane	AM peak average speed (kmph)	AM peak driver stress	Average PM peak hourly flow / lane	PM peak average speed (kmph)	PM peak driver stress
2189_2116	2	595.9	47	High	610.2	47	High	674.7	47	High	671.6	47	High
27035_2200	2	276.6	43.1	High	256.6	43.0	High	315.8	42.6	High	278.4	42.8	High
27035_2340	2	218.3	43.9	High	324.8	42.0	High	242.3	43.7	High	358.0	41.62	High
2116_2189	2	547.9	47	High	562.2	47	High	605.1	47	High	626.4	47	High
2340_27035	2	276.6	43.2	High	256.6	43.0	High	315.8	42.7	High	278.4	42.8	High
2200_27035	2	218.3	44.0	High	324.8	42.0	High	242.3	43.8	High	358.0	41.62	High
2025_1897	3	107.1	63.7	Moderate	140.4	63.4	Moderate	125.1	63.6	Moderate	161.2	63.22	Moderate
2047_2025	3	69.8	87.9	Low	106.6	87.7	Low	89.5	87.9	Low	128.4	87.68	Low
2093_2047	3	146.2	87.6	Low	160.4	87.4	Low	201.7	87.3	Low	193.0	87.18	Low
2101_2108	3	144.6	88	Low	162.4	88	Low	162.6	88	Low	207.7	88	Low
2285_2119	3	221.6	88	Low	160.4	88	Low	283.3	88	Low	187.5	88	Low
2025_2047	3	20.2	88	Low	33.6	87.9	Low	26.0	87.9	Low	44.2	87.97	Low
2047_2093	3	109.9	87.8	Low	121.1	87.7	Low	120.3	87.7	Low	160.9	87.46	Low
2119_2285	3	144.6	82.4	Low	162.4	81.8	Low	162.6	82.2	Low	207.7	81.2	Low
1897_2025	3	25.7	63.2	Moderate	25.4	63.2	Moderate	26.3	63.2	Moderate	25.1	63.2	Moderate
2346_2310	4	485.0	76.9	Low	467.4	73.4	Low	548.4	75.7	Low	538.8	70.9	Low
2310_2346	4	443.9	81.6	Low	475.7	80.4	Low	520.7	80.2	Low	536.8	78.4	Low
1744_1233	6	6.2	81.5	Low	4.2	81.5	Low	6.7	81.5	Low	4.1	81.5	Low
1233_1744	6	4.2	82	Low	3.8	82	Low	4.4	82	Low	3.6	82	Low
1755_1732	7	0	78.3	Low	0	78.3	Low	0	78.3	Low	0	78.3	Low
4665_1755	7	544.3	111.8	Low	598.2	111.6	Low	666.7	111.7	Low	793.1	111.2	Low
1818_1755	7	32.5	81.9	Low	43.8	81.9	Low	48.3	81.9	Low	95.1	81.7	Low

Link ID	Road Section	2023 Do Something						2038 Do Something					
		Average AM peak hourly flow / lane	AM peak average speed (kmph)	AM peak driver stress	Average PM peak hourly flow / lane	PM peak average speed (kmph)	PM peak driver stress	Average AM peak hourly flow / lane	AM peak average speed (kmph)	AM peak driver stress	Average PM peak hourly flow / lane	PM peak average speed (kmph)	PM peak driver stress
2163_1755	7	33.0	80.1	Low	3.5	80.1	Low	42.1	80.1	Low	3.8	80.1	Low
27003_1818	7	30.3	76.4	Low	40.7	76.3	Low	33.4	76.4	Low	47.8	76.2	Low
4695_1818	7	14.3	80.0	Low	7.8	80.8	Low	27.5	80.9	Low	51.7	81.7	Low
4657_4646	7	50.2	75.4	Moderate	43.4	75.4	Moderate	56.4	74.4	Moderate	49.7	74.8	Moderate
1732_1755	7	0	78.2	Low	0	78.1	Low	0	78.1	Low	0	78.1	Low
1755_1818	7	44.3	81.9	Low	50.4	81.9	Low	49.3	81.9	Low	50.8	81.9	Low
1755_2163	7	32.1	80.1	Low	11.3	80.1	Low	35.0	80.1	Low	12.2	80.1	Low
4646_4657	7	55.1	81.9	Low	42.6	81.9	Low	76.0	81.8	Low	58.3	81.9	Low
1755_4665	7	65.6	72.4	Moderate	47.3	71.7	Moderate	90.4	72.0	Moderate	99.0	70.7	Moderate
1818_4695	7	13.5	64	Moderate	17.9	64	Moderate	10.5	64	Moderate	15.1	64	Moderate
1818_27003	7	42.7	76.4	Low	37.2	76.4	Low	51.4	76.4	Low	40.2	76.4	Low

Table 1-7 – 'Do Something' Driver Stress Summary for Scheme Study Area: Part A

Road Section	'Do Something' 2023 AM Peak	'Do Something' 2023 PM Peak	'Do Something' 2038 AM Peak	'Do Something' 2038 PM Peak
1	3 nodes Low 10 nodes Moderate 2 nodes High Overall moderate driver stress for this section.	3 nodes Low 10 nodes Moderate 2 nodes High Overall moderate driver stress for this section.	3 nodes Low 1 node Moderate 11 nodes High Overall high driver stress for this section.	3 nodes Low 8 nodes Moderate 4 nodes High Overall moderate driver stress for this section.
2	5 nodes Low 1 node High Overall Low driver stress for this section.	5 nodes Low 1 node High Overall Low driver stress for this section.	5 nodes Low 1 node High Overall Low driver stress for this section.	5 nodes Low 1 node High Overall Low driver stress for this section.
3	3 nodes Low 1 node High Overall Low driver stress for this section	3 nodes Low 1 node High Overall Low driver stress for this section	3 nodes Low 1 node High Overall Low driver stress for this section	3 nodes Low 1 node High Overall Low driver stress for this section
4	4 nodes Low Overall Low driver stress for this section	4 nodes Low Overall Low driver stress for this section	4 nodes Low Overall Low driver stress for this section	4 nodes Low Overall Low driver stress for this section
5	6 nodes Low 1 node Moderate 1 node High Overall Low driver stress for this section	6 nodes Low 1 node Moderate 1 node High Overall Low driver stress for this section	6 nodes Low 1 node Moderate 1 node High Overall Low driver stress for this section	6 nodes Low 1 node Moderate 1 node High Overall Low driver stress for this section
6	2 nodes Low Overall Low driver stress for this section	2 nodes Low Overall Low driver stress for this section	2 nodes Low Overall Low driver stress for this section	2 nodes Low Overall Low driver stress for this section
7	4 nodes Low Overall Low driver stress for this section	4 nodes Low Overall Low driver stress for this section	4 nodes Low Overall Low driver stress for this section	4 nodes Low Overall Low driver stress for this section
8	2 nodes Low Overall Low driver stress for this section	2 nodes Low Overall Low driver stress for this section	2 nodes Low Overall Low driver stress for this section	2 nodes Low Overall Low driver stress for this section
9	2 nodes Low Overall Low driver stress for this section	2 nodes Low Overall Low driver stress for this section	2 nodes Low Overall Low driver stress for this section	2 nodes Low Overall Low driver stress for this section
10	3 nodes Low 1 node Moderate	3 nodes Low 1 node Moderate	3 nodes Low 1 node Moderate	3 nodes Low 1 node Moderate

Road Section	'Do Something' 2023 AM Peak	'Do Something' 2023 PM Peak	'Do Something' 2038 AM Peak	'Do Something' 2038 PM Peak
	Overall Low driver stress for this section	Overall Low driver stress for this section	Overall Low driver stress for this section	Overall Low driver stress for this section
11	2 nodes Low Overall Low driver stress for this section	2 nodes Low Overall Low driver stress for this section	2 nodes Low Overall Low driver stress for this section	2 nodes Low Overall Low driver stress for this section
12	2 nodes Low Overall Low driver stress for this section	2 nodes Low Overall Low driver stress for this section	2 nodes Low Overall Low driver stress for this section	2 nodes Low Overall Low driver stress for this section
13	2 nodes Low Overall Low driver stress for this section	2 nodes Low Overall Low driver stress for this section	2 nodes Low Overall Low driver stress for this section	2 nodes Low Overall Low driver stress for this section
14	2 nodes Low Overall Low driver stress for this section	2 nodes Low Overall Low driver stress for this section	2 nodes Low Overall Low driver stress for this section	2 nodes Low Overall Low driver stress for this section

Table 1-8 – 'Do Something' Driver Stress Summary for Scheme Study Area: Part B

Road Section	'Do Something' 2023 AM Peak	'Do Something' 2023 PM Peak	'Do Something' 2038 AM Peak	'Do Something' 2038 PM Peak
1	15 nodes Low 1 node Moderate 5 nodes High Overall Low driver stress for this section.	15 nodes Low 3 nodes Moderate 3 nodes High Overall Low driver stress for this section.	14 nodes Low 2 nodes Moderate 5 nodes High Overall Low driver stress for this section.	13 nodes Low 5 nodes Moderate 3 nodes High Overall Low driver stress for this section.
2	6 nodes High Overall High driver stress for this section.	6 nodes High Overall High driver stress for this section.	6 nodes High Overall High driver stress for this section.	6 nodes High Overall High driver stress for this section.
3	7 nodes Low 2 nodes Moderate Overall Low driver stress for this section	7 nodes Low 2 nodes Moderate Overall Low driver stress for this section	7 nodes Low 2 nodes Moderate Overall Low driver stress for this section	7 nodes Low 2 nodes Moderate Overall Low driver stress for this section
4	2 nodes Low Overall Low driver stress for this section	2 nodes Low Overall Low driver stress for this section	2 nodes Low Overall Low driver stress for this section	2 nodes Low Overall Low driver stress for this section
5	No data available	No data available	No data available	No data available
6	2 nodes Low Overall Low driver stress for this section	2 nodes Low Overall Low driver stress for this section	2 nodes Low Overall Low driver stress for this section	2 nodes Low Overall Low driver stress for this section
7	11 nodes Low 3 nodes Moderate Overall Low driver stress for this section	11 nodes Low 3 nodes Moderate Overall Low driver stress for this section	11 nodes Low 3 nodes Moderate Overall Low driver stress for this section	11 nodes Low 3 nodes Moderate Overall Low driver stress for this section

REFERENCES

Ref. 1 - Highways England (1993) DMRB, Volume 11, Section 3, Part 9 Vehicle Travellers

Ref. 2 - Highways England (2019) Design Manual for Roads and Bridges (DMRB) LA 112 Population and human health revision 1

This document is also available on our website at **www.gov.uk /highways**

If you have any enquiries about this document A1inNorthumberland@highwaysengland.co.uk or call **0300 470 4580***.

*Calls to 03 numbers cost no more than a national rate call to an 01 or 02 number and must count towards any inclusive minutes in the same way as 01 and 02 calls.
These rules apply to calls from any type of line including mobile, BT, other fixed line or payphone. Calls may be recorded or monitored.

Registered office Bridge House, 1 Walnut Tree Close, Guildford GU1 4LZ
Highways England Company Limited registered in England and Wales number 09346363