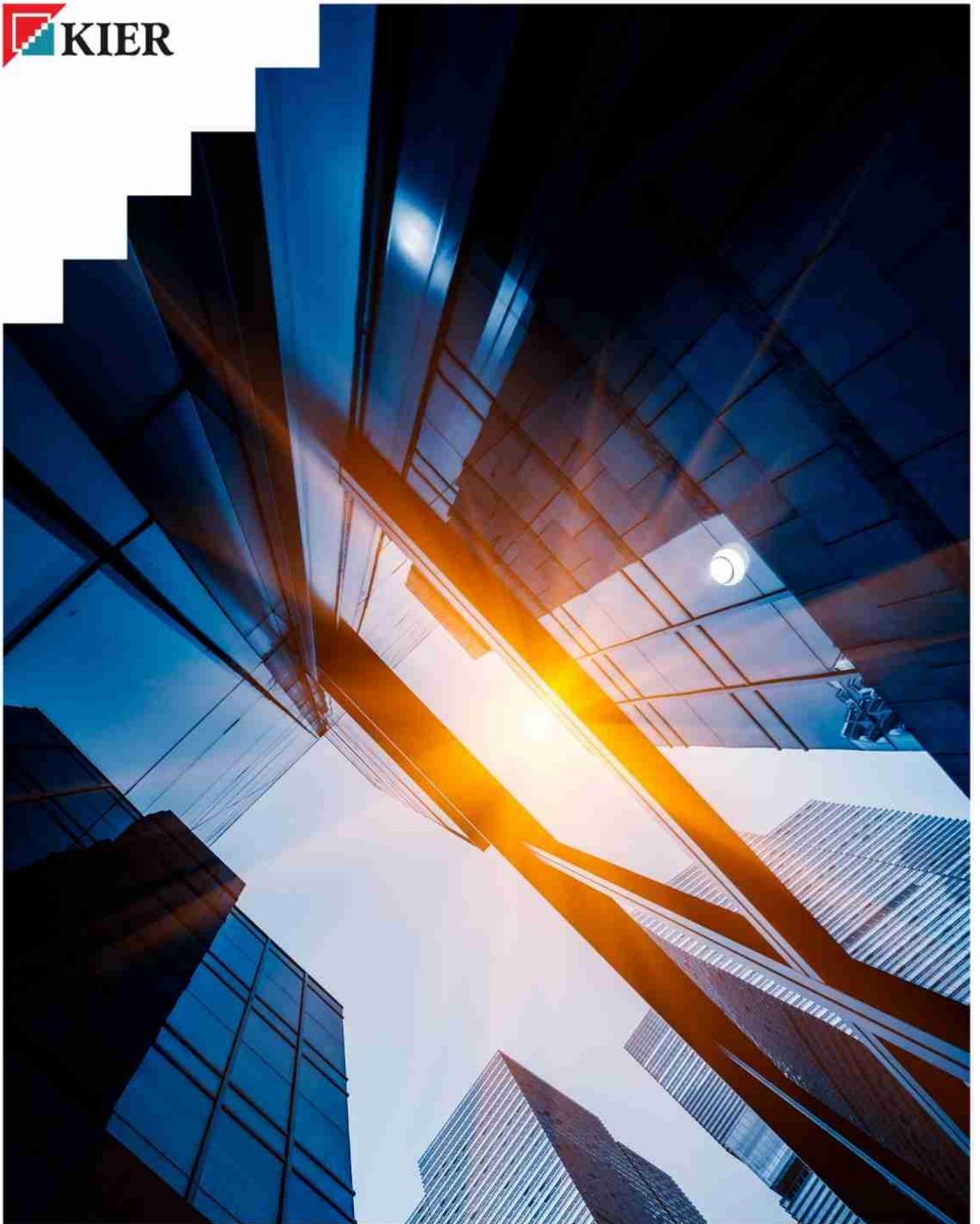




M62 J18-22 LIGHTING RENEWAL

Road Lighting Appraisal

Kier Design
Mechanical Electrical and Technology

This report is an appraisal of the requirement for installing new road lighting on the M62 J18-22 as requested by National Highways. It may not be relied upon by any other person or by the client in relation to any other matters not covered specifically by the scope of this report.

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1.0 Introduction

This road lighting report has been commissioned by National Highways to appraise the justification for installing new road lighting on the M6 J18-22 within the scheme extents shown in Image 1.

Whilst the junctions and conflict areas are included within this report, they have been excluded from the TA501 assessment as requested by National Highways.

The M62 J18 to 22 is the main traffic route between North Manchester and Huddersfield.

The existing mainline carriageway between the project limits is fully lit.

From J18 to halfway between J20 & 21 the mainline is lit in the verges in an opposite arrangement. After this point most of the lighting is twin arm in the central reserve.

The existing lighting is approaching end of life with some lighting columns recently being removed after failing structural testing.

This report follows the National Highways guidance provided in the Design Manual for Road and Bridges (DMRB) standard 'TA 501 - Road lighting appraisal'.

Image 1 below shows the full extents of the area covered in this report.

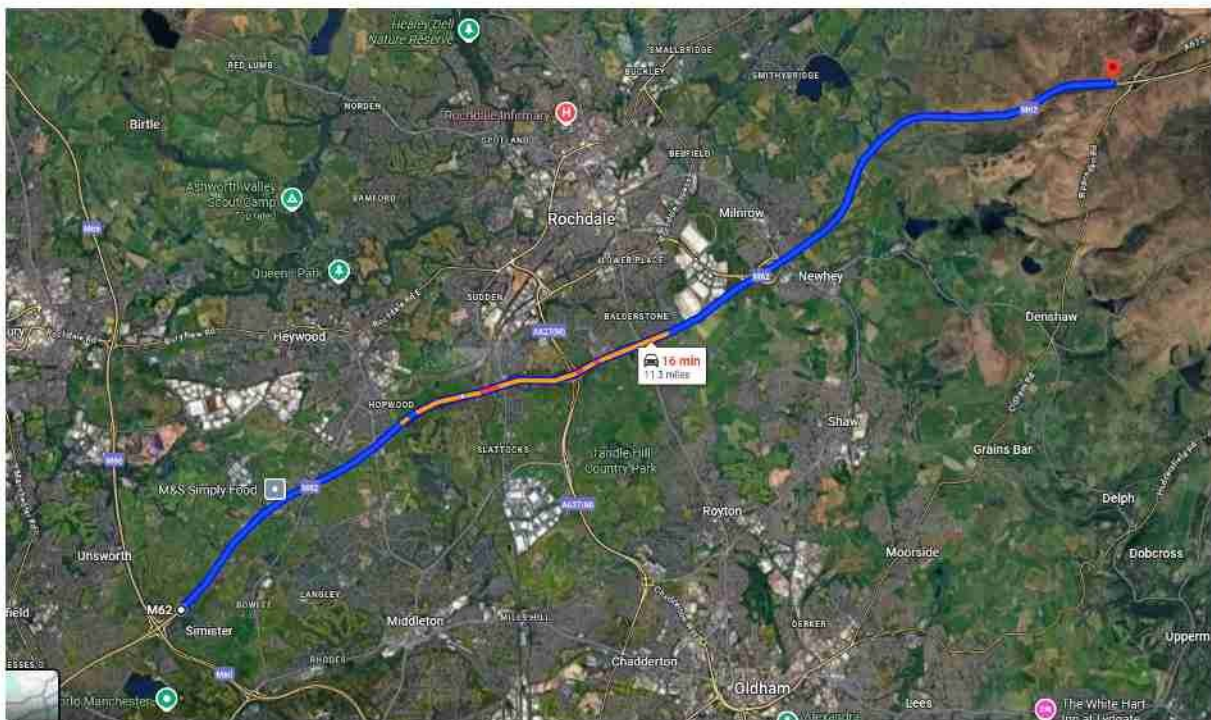


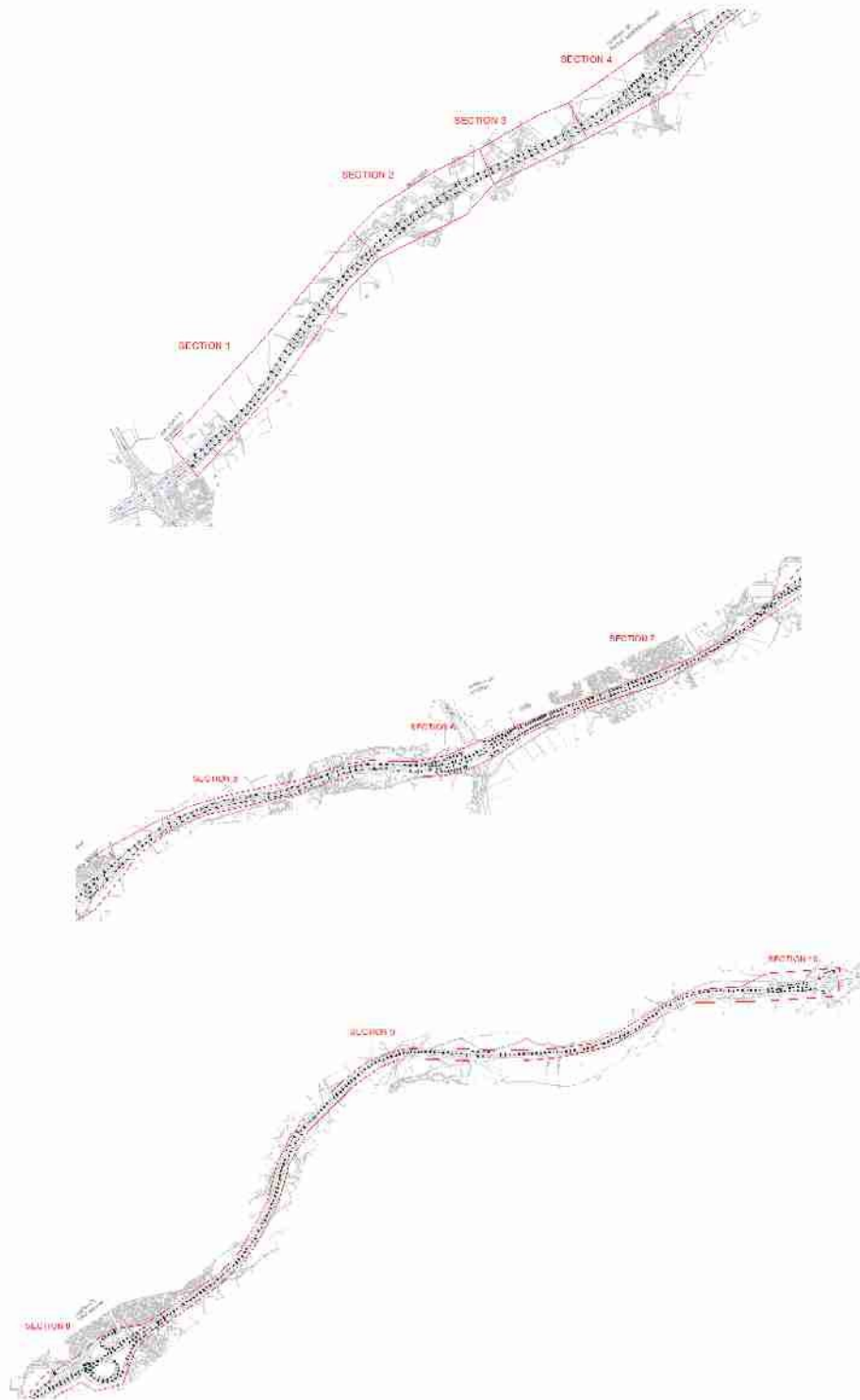
Image 1 - Scheme Extents – M62 J18-22

The scheme area has been divided into ten assessment sections as follows:

- Section 1 – J18 Simister Island to MOTO Services
- Section 2 – MOTO Services
- Section 3 – MOTO Services to J19
- Section 4 – J19 Heywood Interchange

Section 5 – J19 to J20
Section 6 – J20 Thornham Interchange
Section 7 – J20 to J21
Section 8 – J21 with Sir Isaac Newton Way
Section 9 – J21 to J22
Section 10 – J22 with A672

The assessment sections are detailed in image 2 below.



2.0 Existing Conditions

2.1 Road Configuration

The M62 is a standard motorway configuration with four running lanes and grade separated junctions. This configuration transitions to a three-lane layout with a hard shoulder from Junction 20 to Junction 21. Subsequently, it reverts to a four-lane configuration with a hard shoulder approximately 0.62 miles beyond Junction 21 on the M62, this runs up to the end of the scheme extents at Junction 22.

2.2 Existing Road Lighting Layout

The existing lighting assets are believed to have been installed in the 1990's, the columns are a mixture of standard hexagonal and tubular steel with a mixture of SOX and SON/T luminaires. These lighting columns are showing signs of fatigue and both the lighting and electrical infrastructure has now exceeded their expected design life.

Table 2.1 – Existing Lighting Extents and Arrangement

Section	Extent	Existing Lighting	Mainline Luminaire Quantity	Junction Luminaire Quantity	Total
1	J18 Simister Island to MOTO Services	Opposite arrangement lighting columns in the verges of the mainline	78	0	78
2	MOTO Services	Opposite arrangement lighting columns in the verges of the mainline also lighting the motorway services entry and exit	39	0	39
3	MOTO Services to J19	Opposite arrangement lighting columns in the verges of the mainline	28	0	28
4	J19 Heywood Interchange	Opposite arrangement lighting columns in the verges of the mainline and single sided lighting on the slip roads	70	10	80
5	J19 to J20	Opposite arrangement lighting columns in the verges of the mainline	107	0	107
6	J20 Thornham Interchange	Opposite arrangement lighting columns in the verges of the mainline and single sided lighting on the slip roads	90	10	100

7	J20 to J21	Mix of Opposite arrangement mainline lighting in the verge and Twin arm in the central reserve.	105	0	105
8	J21 with Sir Isaac Newton Way	Twin Central arrangement lighting columns in the Central reserve of the mainline and single sided lighting on the slip roads	131	11	142
9	J21 to J22	Mix of Opposite arrangement mainline lighting in the verge and Twin arm in the central reserve.	184	0	184
10	J22 with A672	Twin Central arrangement lighting columns in the Central reserve of the mainline and single sided lighting on the slip roads	23	5	28
Full Extent Totals	-	-	855	36	891

Table 2.2 – Overview of the Scheme Area

Section	Length (km)
1	1.94 km
2	1.0 km
3	0.73 km
4	1.06 km
5	2.64 km
6	0.94 km
7	2.08 km
8	1.66 km
9	6.15 km
10	0.60 km

The annual average daily traffic flow (AADT) on the M62 J18-22, as detailed in Table 1.

Table 2.3 - Traffic Flow

Section	Site ID	Year	Direction	Annual Average Daily Flow (AADF)	Peak Flow	HGV %	AADF Total
1	14815	2025	Eastbound	53844	62332	17.14%	102869
	14638	2025	Westbound	49025	57798	19.37%	
2	14722	2025	Eastbound	68826	78492	19.10%	131090
	14701	2025	Westbound	62264	72558	15.98%	
3	14641	2025	Eastbound	74487	85852	16.13%	140888
	14602	2024	Westbound	66401	75326	19.67%	
4	14712	2025	Eastbound	70179	81016	16.43%	136609
	14635	2023	Westbound	66430	79476	21.95%	
5	14725	2025	Eastbound	73368	84650	17.47%	143468
	14817	2025	Westbound	70100	82585	17.18%	
6	14763	2025	Eastbound	53864	62185	18.47%	105084
	14685	2025	Westbound	51220	60930	22.68%	
7	3402	2025	Eastbound	66371	76170	19.85%	131083
	2433	2025	Westbound	64712	75870	15.87%	
8	4655	2025	Eastbound	53334	63013	18.92%	105512
	3391	2025	Westbound	52178	62577	14.83%	
9	No section data available on WebTRIS						
10	No section data available on WebTRIS						

The speed limit within the scheme extents is 70mph.

3.0 Lighting Design Criteria

The guidance provided in the new National Highways standard 'TD 501 - Road lighting design' has been followed.

The proposed lighting class has been established using the guidance found in BS5489 as shown in Appendix A to enable an indicative road lighting design to be produced to provide the necessary costs for inclusion in the Scheme Appraisal Report (SAR).

The assessment established the lighting class as shown in table 2:

Table 3.1 – Section Lighting Class

Section	Lighting Class
Section 1 – J18 Simister Island to MOTO Services	M3
Section 2 – MOTO Services	M3
Section 3 – MOTO Services to J19	M3
Section 4 – J19 Heywood Interchange	M3
Section 5 – J19 to J20	M3
Section 6 – J20 Thornham Interchange	M3
Section 7 – J20 to J21	M3
Section 8 – J21 Sir Isaac Newton Way	M3
Section 9 – J21 to J22	M3
Section 10 – J22 with A672	M3

Table 3 shows the lighting levels required for these lighting classes as taken from 'BS EN 13201-2: 2015 - Road Lighting Part 2: Performance requirements.

Table 3.2 - Roadway Lighting Levels required for the Lighting Class

M Class	Road Surface Luminance			Threshold Increment	Surround Ratio
	Dry				
	Lave (cd/m2)	Uo	UI		
M3	1	0.4	0.6	15	0.3

4.0 Road Lighting Design Solution

The proposed lighting has been design using the guidance provided in TD 501 and in 'BS 5489-1: 2020 Design of road lighting Part 1: Lighting of roads and public amenity areas - Code of practice'.

Three road lighting layout arrangements options were considered and two were appraised.

4.1 Option 1 - Existing Lighting Layout

This option is to renew all lighting at in same locations as the existing. It includes new columns, LED luminaires, CMS and all associated underground infrastructure. This would include any columns that have been removed due to signs of fatigue and structural failures. All the existing lighting is in the verge. The total number of new lighting columns required is 1145no. with 891no. existing columns to remove.

4.2 Option 2 - Full Extents Mainline Including Unlit Area

This option is to renew all lighting at an optimal spacing of 45m in the verge and includes the areas that are currently unlit. It is comprised of new columns, LED luminaires, CMS and all associated underground infrastructure. The total required lighting columns is 930no. The option will require a new cable network, supplied from both existing and new DNO or privately supplied feeder pillars. With a total of 891no. existing columns to remove.

Individual Assessment Sections 1- 10

Section 1 – J18 Simister Island to MOTO Services

This includes renewal of all lighting within this section. The total number of new columns required is 90no. single luminaire lighting columns with 78no. existing columns removed.

Section 2 – MOTO Services

This includes renewal of all lighting within this section. The total number of new columns required is 46no. single luminaire lighting columns with 39no. existing columns removed.

Section 3 – MOTO Services to J19

This includes renewal of all lighting within this section. The total number of new columns required is 34no. single luminaire lighting columns with 28no. existing columns removed.

Section 4 – J19 Heywood Interchange

This includes renewal of all lighting within this section. The total number of new columns required is 70no. single luminaire lighting columns with 80no. existing columns removed.

Section 5 – J19 to J20

This includes renewal of all lighting within this section. The total number of new columns required is 117no. single luminaire lighting columns with 107no. existing columns removed.

Section 6 – J20 Thornham Interchange

This includes renewal of all lighting within this section. The total number of new columns required is 68no. single luminaire lighting columns with 100no. existing columns removed.

Section 7 – J20 to J21

This includes renewal of all lighting within this section. The total number of new columns required is 92no. single luminaire lighting columns with 105no. existing columns removed.

Section 8 – J21 Sir Isaac Newton Way

This includes renewal of all lighting within this section. The total number of new columns required is 114no. single luminaire lighting columns with 142no. existing columns removed.

Section 9 – J21 to J22

This includes renewal of all lighting within this section. The total number of new columns required is 275no. single luminaire lighting columns with 184no. existing columns removed.

Section 10 – J22 with A672

This includes renewal of all lighting within this section. The total number of new columns required is 24no. single luminaire lighting columns with 28no. existing columns removed.

4.3 Option 3 – Part lighting

This option is to remove all existing lighting assets with new lighting only at the junctions, conflict areas and their approaches. It includes new columns, LED luminaires, CMS and all associated underground infrastructure. The total number of new columns required is 36no. lighting columns with a single luminaire and 891no. existing columns to be removed.

5.0 Road Lighting Capital and Operating Costs

5.1 Capital Costs

The tables below provide details of the works costs for the road lighting for each option and section.

Table 5.1 – Works Costs

Capital Costs	Included in TA501			Not Included in TA501			Totals		
	Proposed Lighting columns	Columns to be Removed	Total Cost	Proposed Lighting columns	Columns to be Removed	Total Cost	Total Proposed Lighting columns	Total Columns to be removed	Grand Total
Option 1	1109	855	£49,744,000.00	36	36	£1,656,000.00	1145	891	£51,400,000.00
Option 2	894	865	£40,979,000.00	36	36	£1,656,000.00	930	901	£42,635,000.00
Section 1	90	78	£4,080,000.00	0	0	£0.00	90	78	£4,080,000.00
Section 2	46	39	£2,081,000.00	0	0	£0.00	46	39	£2,081,000.00
Section 3	34	28	£1,534,000.00	0	0	£0.00	34	28	£1,534,000.00
Section 4	60	70	£2,810,000.00	10	10	£460,000.00	70	80	£3,270,000.00
Section 5	117	107	£5,332,000.00	0	0	£0.00	117	107	£5,332,000.00
Section 6	58	90	£2,828,000.00	10	10	£460,000.00	68	100	£3,288,000.00
Section 7	92	105	£4,297,000.00	0	0	£0.00	92	105	£4,297,000.00
Section 8	103	131	£4,878,000.00	11	11	£506,000.00	114	142	£5,384,000.00
Section 9	275	184	£12,195,000.00	0	0	£0.00	275	184	£12,195,000.00
Section 10	19	33	£944,000.00	5	5	£230,000.00	24	38	£1,174,000.00
Option 3	0	855	£4,275,000.00	36	36	£1,656,000.00	36	891	£5,931,000.00

* The works costs are based on costs of £46,000 for proposed lighting columns (including removing existing) & £5,000 for column removal provided by National Highways

5.2 Operating Costs

The operating costs of the road lighting for each option has been calculated as detailed in TA 501.

Table 5 provides details of the operating costs for the road lighting for each option.

Table 5.2 - Operating Costs

Energy & Maintenance cost	Included in TA501			Not Included in TA501			Totals
	Estimated Annual Energy Cost (£)	Estimated Annual Maintenance Cost (£)	Total	Estimated Annual Energy Cost (£)	Estimated Annual Maintenance Cost (£)	Total	Grand Total
Option 1	£190,364.29	£103,379.67	£293,743.96	£2,924.98	£4,386.67	£7,311.65	£301,055.61
Option 2	£82,105.54	£46,306.66	£128,412.20	£2,263.54	£2,600.00	£4,863.54	£133,275.74
Section 1	£15,242.88	£8,333.33	£23,576.21	£0.00	£0.00	£0.00	£23,576.21
Section 2	£7,790.80	£4,320.00	£12,110.80	£0.00	£0.00	£0.00	£12,110.80
Section 3	£5,641.69	£3,246.67	£8,888.36	£0.00	£0.00	£0.00	£8,888.36
Section 4	£9,955.93	£5,633.33	£15,589.26	£993.30	£1,300.00	£2,293.30	£17,882.56
Section 5	£16,602.37	£10,806.67	£27,409.04	£0.00	£0.00	£0.00	£27,409.04
Section 6	£10,553.29	£5,460.00	£16,013.29	£1,270.24	£1,300.00	£2,570.24	£18,583.53
Section 7	£16,318.57	£8,506.67	£24,825.24	£0.00	£0.00	£0.00	£24,825.24
Section 8	£18,923.14	£9,680.00	£28,603.14	£1,166.10	£1,386.67	£2,552.77	£31,155.91
Section 9	£46,575.45	£25,366.67	£71,942.12	£0.00	£0.00	£0.00	£71,942.12
Section 10	£4,674.71	£1,913.33	£6,588.04	£1,230.19	£700.00	£1,930.19	£8,518.23
Option 3	£0.00	£0.00	£0.00	£2,924.98	£5,586.67	£8,511.65	£8,511.65

The following assumptions have been made:

- Energy cost - 28p/kWh
- Energy inflation rate - 3%
- Decommissioning cost - 20% of total capital cost
- Appraisal period - 30 years

An example of the Energy costs calculations is included in Appendix B.

An example of the Maintenance costs calculations is included in Appendix C.

5.3 Summary of Cost Over Scheme Lifecycle

The below table outlines the summary of cost of the scheme lifecycle for each option

Table 5.3 – Summary of cost over scheme lifecycle

Summary of Cost over scheme lifecycle			
Option	Mainline Cost	Junction Cost	Total Cost
Option 1	£70,923,254.38	£198,503.19	£71,121,757.57
Option 2	£56,674,020.80	£2,041,548.00	£58,715,568.81
Section 1	£5,631,348.44	£0.00	£5,631,348.44
Section 2	£2,884,984.02	£0.00	£2,884,984.02
Section 3	£2,119,326.54	£0.00	£2,119,326.54
Section 4	£3,889,679.91	£570,601.51	£4,460,281.43
Section 5	£7,235,800.25	£0.00	£7,235,800.25
Section 6	£3,906,247.93	£580,258.32	£4,486,506.25
Section 7	£5,908,120.32	£0.00	£5,908,120.32
Section 8	£6,814,023.15	£578,117.90	£7,392,141.05
Section 9	£16,931,974.71	£0.00	£16,931,974.71
Section 10	£1,352,515.52	£312,570.27	£1,665,085.80
Option 3	£4,455,000.00	£10,972,130.52	£15,427,130.52

6.0 Personal Injury Collisions - Data Analysis

Personal Injury Collision (PIC) data have been provided by the regional asset management team for the date range 2019 to 2023.

The proportion of PICs occurring during the hours of darkness has been obtained from the PIC data and is detailed in Annex D completed by the road safety engineer.

The annual PIC savings, following good practice, have been calculated based on the following PIC savings attributed to the provision of road lighting on previously lit roads:

- Main Line - 10%

The national average proportion of dark PICs on the strategic road network is 28%.

On the M62 J18-22 the average number of darkness PICs during the five-year study period was 6.2 per year.

The STATS 19 dataset from the DfT website does not contain detailed text description of collision circumstances, so it was not possible to identify and exclude those where driver gross negligence (DGN) was a significant contributory factor.

The likely reduction in PICs in darkness on a motorway with lighting has been taken as 10% (IAN 167/12 'Guidance for the Removal of Road Lighting' Highways Agency 2012).

Based on the darkness PIC saving calculation method for renewing lighting on a lit link / junction, as given in TA 501, the predicted PIC saving is:

$6.2 \times (10 / (100 - 10)) = 0.69$ PICs saved per year by renewing lighting

Table 6.1 – Dark PIC

Section	1	2	3	4	5	6	7	8	9	10	Full Extents
Dark PIC saved per year	0.13	0.04	0	0.07	0.11	0.02	0.04	0.04	0.20	0.02	0.67

Please refer to Appendix D for RSE reports.

7.0 Scheme Appraisal Report (SAR) Results

The Highways England's SAR 2020 has been used to determine the monetary benefit of the proposed road lighting for the various section of the scheme through the calculation of the benefit cost ratio (BCR).

The SAR results are detailed in Table 7.

Table 7.1 - SAR Results

SAR Results (discounted to 2010 prices)			
Option	PVC	PVB	BCR
Option 1	£43,109,815.00	£1,225,592.00	0.03
Option 2	£34,337,145.00	£1,190,067.00	0.03
Section 1	£3,422,190.00	£230,909.00	0.07
Section 2	£1,751,665.00	£71,049.00	0.04
Section 3	£1,288,665.00	£0.00	0.00
Section 4	£2,337,635.00	£124,335.00	0.05
Section 5	£4,419,939.00	£195,384.00	0.04
Section 6	£2,344,740.00	£35,524.00	0.02
Section 7	£3,589,443.00	£71,049.00	0.02
Section 8	£4,104,567.00	£71,049.00	0.02
Section 9	£10,278,843.00	£355,244.00	0.03
Section 10	£799,458.00	£35,524.00	0.04
Option 3	£6,958,054.00	£1,225,592.00	0.18

For road lighting schemes on motorways incorporating variable mandatory speed limits there shall be a positive BCR ≥ 2 . For all motorways, APTRs and dual carriageways not incorporating variable mandatory speed limits there shall be a positive BCR ≥ 1 .

SAR documents included in Appendix E.

8.0 Non-quantifiable and Other Impacts

The impacts of the non-quantifiable benefits of the replacement of the road lighting have been considered and are detailed in Table 8 below.

Table 8.1 - Impacts of Non-quantifiable Impacts

Non-Quantifiable Affect	Comments
Landscape adverse	The addition of road lighting where previous lighting has been turned off would negatively impact on an intrinsically dark night-time landscape.
Townscape	The installation of road lighting where previous lighting has been turned off would have a significant impact on the adjacent landscape.
Heritage	There is no impact on the local heritage.
Biodiversity	The addition of road lighting where previous lighting has been turned off will have impact on local wildlife, such as insects, bats & birds etc.
Promote active transport	This is a motorway and as there is no access for cyclists or pedestrians there is no scope to promote active transport.
Journey ambiance	The existing journey ambiance will be increased if the lighting is installed along the scheme extents of the M62.
Accidents	See Section 6.0 Personal Injury Collisions - Data Analysis & Annex A
Security	The feeling of security for road users will be increased if the lighting is installed.
Severance	Due to the type of scheme, there will be no significant impact on severance.
Government policy	The introduction of road lighting in the unlit sections would reduce PICs

Subject to the chosen option for the scheme, there will be a saving made due to the more energy-efficient LED luminaires and operating regimes being used. However, a greater saving is made by the removal of lighting, meaning the less proposed lighting installed will have a greater saving towards NetZero. Table 8-2 details the total CO2e emissions for each of the lighting options, which are covered in more detail under the conclusions section of this report.

Table 8.2 – Summary of CO₂e Emissions

Summary of CO ₂ e Emissions			
Option	Mainline CO ₂ e Rate (tonnes/CO ₂ e)	Junctions CO ₂ e Rate (tonnes/CO ₂ e)	Total CO ₂ e (tonnes/CO ₂ e)
Option 1	369.85	5.68	375.53
Option 2	295.85	9.05	304.91
Section 1	29.61	0.00	29.61
Section 2	15.14	0.00	15.14
Section 3	10.96	0.00	10.96
Section 4	19.34	1.93	21.27
Section 5	32.26	0.00	32.26
Section 6	20.50	2.47	22.97
Section 7	31.70	0.00	31.70
Section 8	36.76	2.27	39.03
Section 9	90.49	0.00	90.49
Section 10	9.08	2.39	11.47
Option 3	0.00	5.68	5.68

9.0 Conclusions and Recommendations

9.1 Conclusions

The appraisal for the requirement of road lighting on the M62 J18-22 has been carried out using the guidance provided in TA 501.

The SAR results for all the options provide BCRs that are below the level required to economically justify the provision of installation of new road lighting.

The analysis of the non-quantifiable impacts has also found that there are no impacts that would justify the provision of road lighting.

9.2 Recommendations

The SAR results indicate that the installation of new road lighting along the M62 J18-22 is not economically justifiable.

Prior to removal of lighting it is recommended that written communication be sent to MOTO Services, located between J18 Simister Island and J19 Heywood Interchange, advising them to review their high mast and slip road lighting. As the SAR results indicate that there is no economic justification for the installation of new road lighting, there is a concern regarding light pollution onto the M62, particularly along the Westbound carriageway, due to the current positioning of the high mast lighting.

Appendix A – Lighting Class Selection

Parameters for Lighting Class Selection for M62 J18-22 Section 1

Parameter	Requirement	Details
Speed Limit	<i>enter speed limit in mph</i>	70
Traffic Flow	<i>enter AADT</i>	146203
Composition	<i>enter MP (Mainly Pedestrian) or M (Mixed) or MO (Motorised Only)</i>	MO
Dual Carriageway	<i>enter Y or N</i>	Y
Junction Density	<i>enter H (High) or M (Moderate)</i>	H
Parked Vehicles/Bus Stops/Pedestrian Crossing	<i>enter Y or N</i>	N
Ambient Luminance	<i>enter CC (City/Town Centre / Shop frontages) or N (Normal) or R (Rural)</i>	R
Is the route clear of obstructions/clearly identifiable?	<i>enter V (Very Difficult), D (Difficult) or E (Easy)</i>	E

Parameters for Lighting Class Selection for M62 J18-22 Section 2

Parameter	Requirement	Details
Speed Limit	<i>enter speed limit in mph</i>	70
Traffic Flow	<i>enter AADT</i>	147397
Composition	<i>enter MP (Mainly Pedestrian) or M (Mixed) or MO (Motorised Only)</i>	MO
Dual Carriageway	<i>enter Y or N</i>	Y
Junction Density	<i>enter H (High) or M (Moderate)</i>	H
Parked Vehicles/Bus Stops/Pedestrian Crossing	<i>enter Y or N</i>	N
Ambient Luminance	<i>enter CC (City/Town Centre / Shop frontages) or N (Normal) or R (Rural)</i>	R
Is the route clear of obstructions/clearly identifiable?	<i>enter V (Very Difficult), D (Difficult) or E (Easy)</i>	E

Parameters for Lighting Class Selection for M62 J18-22 Section 3

Parameter	Requirement	Details
Speed Limit	enter speed limit in mph	70
Traffic Flow	enter AADT	147397
Composition	enter MP (Mainly Pedestrian) or M (Mixed) or MO (Motorised Only)	MO
Dual Carriageway	enter Y or N	Y
Junction Density	enter H (High) or M (Moderate)	H
Parked Vehicles/Bus Stops/Pedestrian Crossing	enter Y or N	N
Ambient Luminance	enter CC (City/Town Centre / Shop frontages) or N (Normal) or R (Rural)	R
Is the route clear of obstructions/clearly identifiable?	enter V (Very Difficult), D (Difficult) or E (Easy)	E

Parameters for Lighting Class Selection for M62 J18-22 Section 4

Parameter	Requirement	Details
Speed Limit	enter speed limit in mph	70
Traffic Flow	enter AADT	147397
Composition	enter MP (Mainly Pedestrian) or M (Mixed) or MO (Motorised Only)	MO
Dual Carriageway	enter Y or N	Y
Junction Density	enter H (High) or M (Moderate)	H
Parked Vehicles/Bus Stops/Pedestrian Crossing	enter Y or N	N
Ambient Luminance	enter CC (City/Town Centre / Shop frontages) or N (Normal) or R (Rural)	R
Is the route clear of obstructions/clearly identifiable?	enter V (Very Difficult), D (Difficult) or E (Easy)	E

Parameters for Lighting Class Selection for M62 J18-22 Section 5

Parameter	Requirement	Details
Speed Limit	enter speed limit in mph	70
Traffic Flow	enter AADT	139735
Composition	enter MP (Mainly Pedestrian) or M (Mixed) or MO (Motorised Only)	MO
Dual Carriageway	enter Y or N	Y
Junction Density	enter H (High) or M (Moderate)	H
Parked Vehicles/Bus Stops/Pedestrian Crossing	enter Y or N	N
Ambient Luminance	enter CC (City/Town Centre / Shop frontages) or N (Normal) or R (Rural)	R
Is the route clear of obstructions/clearly identifiable?	enter V (Very Difficult), D (Difficult) or E (Easy)	E

Parameters for Lighting Class Selection for M62 J18-22 Section 6

Parameter	Requirement	Details
Speed Limit	enter speed limit in mph	70
Traffic Flow	enter AADT	139735
Composition	enter MP (Mainly Pedestrian) or M (Mixed) or MO (Motorised Only)	MO
Dual Carriageway	enter Y or N	Y
Junction Density	enter H (High) or M (Moderate)	H
Parked Vehicles/Bus Stops/Pedestrian Crossing	enter Y or N	N
Ambient Luminance	enter CC (City/Town Centre / Shop frontages) or N (Normal) or R (Rural)	R
Is the route clear of obstructions/clearly identifiable?	enter V (Very Difficult), D (Difficult) or E (Easy)	E

Parameters for Lighting Class Selection for M62 J18-22 Section 7

Parameter	Requirement	Details
Speed Limit	enter speed limit in mph	70
Traffic Flow	enter AADT	131466
Composition	enter MP (Mainly Pedestrian) or M (Mixed) or MO (Motorised Only)	MO
Dual Carriageway	enter Y or N	Y
Junction Density	enter H (High) or M (Moderate)	H
Parked Vehicles/Bus Stops/Pedestrian Crossing	enter Y or N	N
Ambient Luminance	enter CC (City/Town Centre / Shop frontages) or N (Normal) or R (Rural)	R
Is the route clear of obstructions/clearly identifiable?	enter V (Very Difficult), D (Difficult) or E (Easy)	E

Parameters for Lighting Class Selection for M62 J18-22 Section 8

Parameter	Requirement	Details
Speed Limit	enter speed limit in mph	70
Traffic Flow	enter AADT	110641
Composition	enter MP (Mainly Pedestrian) or M (Mixed) or MO (Motorised Only)	MO
Dual Carriageway	enter Y or N	Y
Junction Density	enter H (High) or M (Moderate)	H
Parked Vehicles/Bus Stops/Pedestrian Crossing	enter Y or N	N
Ambient Luminance	enter CC (City/Town Centre / Shop frontages) or N (Normal) or R (Rural)	R
Is the route clear of obstructions/clearly identifiable?	enter V (Very Difficult), D (Difficult) or E (Easy)	E

Parameters for Lighting Class Selection for M62 J18-22 Section 9

Parameter	Requirement	Details
Speed Limit	<i>enter speed limit in mph</i>	70
Traffic Flow	<i>enter AADT</i>	103681
Composition	<i>enter MP (Mainly Pedestrian) or M (Mixed) or MO (Motorised Only)</i>	MO
Dual Carriageway	<i>enter Y or N</i>	Y
Junction Density	<i>enter H (High) or M (Moderate)</i>	H
Parked Vehicles/Bus Stops/Pedestrian Crossing	<i>enter Y or N</i>	N
Ambient Luminance	<i>enter CC (City/Town Centre / Shop frontages) or N (Normal) or R (Rural)</i>	R
Is the route clear of obstructions/clearly identifiable?	<i>enter V (Very Difficult), D (Difficult) or E (Easy)</i>	E

Parameters for Lighting Class Selection for M62 J18-22 Section 10

Parameter	Requirement	Details
Speed Limit	<i>enter speed limit in mph</i>	70
Traffic Flow	<i>enter AADT</i>	103681
Composition	<i>enter MP (Mainly Pedestrian) or M (Mixed) or MO (Motorised Only)</i>	MO
Dual Carriageway	<i>enter Y or N</i>	Y
Junction Density	<i>enter H (High) or M (Moderate)</i>	H
Parked Vehicles/Bus Stops/Pedestrian Crossing	<i>enter Y or N</i>	N
Ambient Luminance	<i>enter CC (City/Town Centre / Shop frontages) or N (Normal) or R (Rural)</i>	R
Is the route clear of obstructions/clearly identifiable?	<i>enter V (Very Difficult), D (Difficult) or E (Easy)</i>	E

Using the guidance provided in PD CEN/TR 13201-1: 2014, which accounts for the key and additional considerations within the weighting values process for lighting class selection, the lighting classes have been established as detailed below.

Lighting Class Selection for M62 18-22 Section 1

Parameter	Options	Weighting Values Vw	Selected Weighting Value
Speed	Very high - 62mph and above	2	2
	High - 44mph to 61mph	1	
	Moderate - 25mph to 43mph	-1	
	Low - 24mph and below	-2	
Traffic volume	Very high	1	1
	High	0.5	
	Moderate	0	
	Low	-0.5	
	Very low	-1	
Traffic composition	Mixed with high percentage of non-motorised	2	0
	Mixed	1	
	Motorised only	0	
Separation of carriageways	No	1	0
	Yes	0	
Intersection density	High	1	1
	Moderate	0	
Parked vehicles	Present	0.5	0
	Not present	0	
Ambient luminance	High	1	-1
	Moderate	0	
	Low	-1	
Navigational Task	Very Difficult	2	0
	Difficult	1	
	Easy	0	
		Sum of Weighting Values Vws	3
		Lighting class M = 6 - Vws	3
		Recommended Lighting class for Main Carriageway	M3
		Recommended Lighting class for Conflict Area	C2

Lighting Class Selection for M62 18-22 Section 2

Parameter	Options	Weighting Values Vw	Selected Weighting Value
Speed	Very high - 62mph and above	2	2
	High - 44mph to 61mph	1	
	Moderate - 25mph to 43mph	-1	
	Low - 24mph and below	-2	
Traffic volume	Very high	1	1
	High	0.5	
	Moderate	0	
	Low	-0.5	
	Very low	-1	
Traffic composition	Mixed with high percentage of non-motorised	2	0
	Mixed	1	
	Motorised only	0	
Separation of carriageways	No	1	0
	Yes	0	
Intersection density	High	1	1
	Moderate	0	
Parked vehicles	Present	0.5	0
	Not present	0	
Ambient luminance	High	1	-1
	Moderate	0	
	Low	-1	
Navigational Task	Very Difficult	2	0
	Difficult	1	
	Easy	0	
		Sum of Weighting Values Vws	3
		Lighting class M = 6 - Vws	3
		Recommended Lighting class for Main Carriageway	M3
		Recommended Lighting class for Conflict Area	C2

Lighting Class Selection for M62 18-22 Section 3

Parameter	Options	Weighting Values Vw	Selected Weighting Value
Speed	Very high - 62mph and above	2	2
	High - 44mph to 61mph	1	
	Moderate - 25mph to 43mph	-1	
	Low - 24mph and below	-2	
Traffic volume	Very high	1	1
	High	0.5	
	Moderate	0	
	Low	-0.5	
	Very low	-1	
Traffic composition	Mixed with high percentage of non-motorised	2	0
	Mixed	1	
	Motorised only	0	
Separation of carriageways	No	1	0
	Yes	0	
Intersection density	High	1	1
	Moderate	0	
Parked vehicles	Present	0.5	0
	Not present	0	
Ambient luminance	High	1	-1
	Moderate	0	
	Low	-1	
Navigational Task	Very Difficult	2	0
	Difficult	1	
	Easy	0	
		Sum of Weighting Values Vws	3
		Lighting class $M = 6 - Vws$	3
		Recommended Lighting class for Main Carriageway	M3
		Recommended Lighting class for Conflict Area	C2

Lighting Class Selection for M62 J18-22 Section 4

Parameter	Options	Weighting Values Vw	Selected Weighting Value
Speed	Very high - 62mph and above	2	2
	High - 44mph to 61mph	1	
	Moderate - 25mph to 43mph	-1	
	Low - 24mph and below	-2	
Traffic volume	Very high	1	1
	High	0.5	
	Moderate	0	
	Low	-0.5	
	Very low	-1	
Traffic composition	Mixed with high percentage of non-motorised	2	0
	Mixed	1	
	Motorised only	0	
Separation of carriageways	No	1	0
	Yes	0	
Intersection density	High	1	1
	Moderate	0	
Parked vehicles	Present	0.5	0
	Not present	0	
Ambient luminance	High	1	-1
	Moderate	0	
	Low	-1	
Navigational Task	Very Difficult	2	0
	Difficult	1	
	Easy	0	
		Sum of Weighting Values Vws	3
		Lighting class M = 6 - Vws	3
		Recommended Lighting class for Main Carriageway	M3
		Recommended Lighting class for Conflict Area	C2

Lighting Class Selection for M62 J18-22 Section 5

Parameter	Options	Weighting Values Vw	Selected Weighting Value
Speed	Very high - 62mph and above	2	2
	High - 44mph to 61mph	1	
	Moderate - 25mph to 43mph	-1	
	Low - 24mph and below	-2	
Traffic volume	Very high	1	1
	High	0.5	
	Moderate	0	
	Low	-0.5	
	Very low	-1	
Traffic composition	Mixed with high percentage of non-motorised	2	0
	Mixed	1	
	Motorised only	0	
Separation of carriageways	No	1	0
	Yes	0	
Intersection density	High	1	1
	Moderate	0	
Parked vehicles	Present	0.5	0
	Not present	0	
Ambient luminance	High	1	-1
	Moderate	0	
	Low	-1	
Navigational Task	Very Difficult	2	0
	Difficult	1	
	Easy	0	
		Sum of Weighting Values Vws	3
		Lighting class M = 6 - Vws	3
		Recommended Lighting class for Main Carriageway	M3
		Recommended Lighting class for Conflict Area	C2

Lighting Class Selection for M62 J18-22 Section 6

Parameter	Options	Weighting Values Vw	Selected Weighting Value
Speed	Very high - 62mph and above	2	2
	High - 44mph to 61mph	1	
	Moderate - 25mph to 43mph	-1	
	Low - 24mph and below	-2	
Traffic volume	Very high	1	1
	High	0.5	
	Moderate	0	
	Low	-0.5	
	Very low	-1	
Traffic composition	Mixed with high percentage of non-motorised	2	0
	Mixed	1	
	Motorised only	0	
Separation of carriageways	No	1	0
	Yes	0	
Intersection density	High	1	1
	Moderate	0	
Parked vehicles	Present	0.5	0
	Not present	0	
Ambient luminance	High	1	-1
	Moderate	0	
	Low	-1	
Navigational Task	Very Difficult	2	0
	Difficult	1	
	Easy	0	
		Sum of Weighting Values Vws	3
		Lighting class $M = 6 - Vws$	3
		Recommended Lighting class for Main Carriageway	M3
		Recommended Lighting class for Conflict Area	C2

Lighting Class Selection for M62 J18-22 Section 7

Parameter	Options	Weighting Values Vw	Selected Weighting Value
Speed	Very high - 62mph and above	2	2
	High - 44mph to 61mph	1	
	Moderate - 25mph to 43mph	-1	
	Low - 24mph and below	-2	
Traffic volume	Very high	1	1
	High	0.5	
	Moderate	0	
	Low	-0.5	
	Very low	-1	
Traffic composition	Mixed with high percentage of non-motorised	2	0
	Mixed	1	
	Motorised only	0	
Separation of carriageways	No	1	0
	Yes	0	
Intersection density	High	1	1
	Moderate	0	
Parked vehicles	Present	0.5	0
	Not present	0	
Ambient luminance	High	1	-1
	Moderate	0	
	Low	-1	
Navigational Task	Very Difficult	2	0
	Difficult	1	
	Easy	0	
		Sum of Weighting Values Vws	3
		Lighting class M = 6 - Vws	3
		Recommended Lighting class for Main Carriageway	M3
		Recommended Lighting class for Conflict Area	C2

Lighting Class Selection for M62 J18-22 Section 8

Parameter	Options	Weighting Values Vw	Selected Weighting Value
Speed	Very high - 62mph and above	2	2
	High - 44mph to 61mph	1	
	Moderate - 25mph to 43mph	-1	
	Low - 24mph and below	-2	
Traffic volume	Very high	1	1
	High	0.5	
	Moderate	0	
	Low	-0.5	
	Very low	-1	
Traffic composition	Mixed with high percentage of non-motorised	2	0
	Mixed	1	
	Motorised only	0	
Separation of carriageways	No	1	0
	Yes	0	
Intersection density	High	1	1
	Moderate	0	
Parked vehicles	Present	0.5	0
	Not present	0	
Ambient luminance	High	1	-1
	Moderate	0	
	Low	-1	
Navigational Task	Very Difficult	2	0
	Difficult	1	
	Easy	0	
		Sum of Weighting Values Vws	3
		Lighting class $M = 6 - Vws$	3
		Recommended Lighting class for Main Carriageway	M3
		Recommended Lighting class for Conflict Area	C2

Lighting Class Selection for M62 J18-22 Section 9

Parameter	Options	Weighting Values Vw	Selected Weighting Value
Speed	Very high - 62mph and above	2	2
	High - 44mph to 61mph	1	
	Moderate - 25mph to 43mph	-1	
	Low - 24mph and below	-2	
Traffic volume	Very high	1	1
	High	0.5	
	Moderate	0	
	Low	-0.5	
	Very low	-1	
Traffic composition	Mixed with high percentage of non-motorised	2	0
	Mixed	1	
	Motorised only	0	
Separation of carriageways	No	1	0
	Yes	0	
Intersection density	High	1	1
	Moderate	0	
Parked vehicles	Present	0.5	0
	Not present	0	
Ambient luminance	High	1	-1
	Moderate	0	
	Low	-1	
Navigational Task	Very Difficult	2	0
	Difficult	1	
	Easy	0	
		Sum of Weighting Values Vws	3
		Lighting class $M = 6 - Vws$	3
		Recommended Lighting class for Main Carriageway	M3
		Recommended Lighting class for Conflict Area	C2

Lighting Class Selection for M62 J18-22 Section 10

Parameter	Options	Weighting Values Vw	Selected Weighting Value
Speed	Very high - 62mph and above	2	2
	High - 44mph to 61mph	1	
	Moderate - 25mph to 43mph	-1	
	Low - 24mph and below	-2	
Traffic volume	Very high	1	1
	High	0.5	
	Moderate	0	
	Low	-0.5	
	Very low	-1	
Traffic composition	Mixed with high percentage of non-motorised	2	0
	Mixed	1	
	Motorised only	0	
Separation of carriageways	No	1	0
	Yes	0	
Intersection density	High	1	1
	Moderate	0	
Parked vehicles	Present	0.5	0
	Not present	0	
Ambient luminance	High	1	-1
	Moderate	0	
	Low	-1	
Navigational Task	Very Difficult	2	0
	Difficult	1	
	Easy	0	
		Sum of Weighting Values Vws	3
		Lighting class $M = 6 - Vws$	3
		Recommended Lighting class for Main Carriageway	M3
		Recommended Lighting class for Conflict Area	C2

Option 1 Mainline

Option 1 Junctions

[illegible]

Option 2 Section 1 Mainline

Description	Luminaire Types Quantity	90
		Mainline
Annual Energy Costs		
System Wattage KW		0.148
Price per KWh (pounds)		0.28
Burning Hours		4,087
Present Day Annual Energy Cost (average per lantern)		£169.37
Annual Energy Cost		£15,242.88
Annual Carbon Costs		
Total kWh per annum		605
Tonnes of Carbon (0.544kg/kWh) Per unit		0.33
Tonnes of Carbon		29.61
Cost per tonne of Carbon		£16.00
Annual Carbon Cost		£473.84
Annual Operational Cost		£15,716.71
Total Annual Energy Cost (Does not include Carbon)		£15,242.88
Total Annual Carbon Cost		£473.84
Total Tonnes of Carbon		29.61

Option 2 Section 2 Mainline

Description	Luminaire Types Quantity	46
		Mainline
Annual Energy Costs		
System Wattage KW		0.148
Price per KWh (pounds)		0.28
Burning Hours		4,087
Present Day Annual Energy Cost (average per lantern)		£169.37
Annual Energy Cost		£7,790.80
Annual Carbon Costs		
Total kWh per annum		605
Tonnes of Carbon (0.544kg/kWh) Per unit		0.33
Tonnes of Carbon		15.14
Cost per tonne of Carbon		£16.00
Annual Carbon Cost		£242.18
Annual Operational Cost		£8,032.99
Total Annual Energy Cost (Does not include Carbon)		£7,790.80
Total Annual Carbon Cost		£242.18
Total Tonnes of Carbon		15.14

Option 2 Section 3 Mainline

Description	Luminaire Types Quantity	34
		Mainline
Annual Energy Costs		
System Wattage KW		0.145
Price per KWh (pounds)		0.28
Burning Hours		4,087
Present Day Annual Energy Cost (average per lantern)		£165.93
Annual Energy Cost		£5,641.69
Annual Carbon Costs		
Total kWh per annum		593
Tonnes of Carbon (0.544kg/kWh) Per unit		0.32
Tonnes of Carbon		10.96
Cost per tonne of Carbon		£16.00
Annual Carbon Cost		£175.38
Annual Operational Cost		£5,817.07
Total Annual Energy Cost (Does not include Carbon)		£5,641.69
Total Annual Carbon Cost		£175.38
Total Tonnes of Carbon		10.96

Option 2 Section 4 Mainline

Description	Luminaire Types Quantity	60
		Mainline
Annual Energy Costs		
System Wattage KW		0.145
Price per KWh (pounds)		0.28
Burning Hours		4,087
Present Day Annual Energy Cost (average per lantern)		£165.93
Annual Energy Cost		£9,955.93
Annual Carbon Costs		
Total kWh per annum		593
Tonnes of Carbon (0.544kg/kWh) Per unit		0.32
Tonnes of Carbon		19.34
Cost per tonne of Carbon		£16.00
Annual Carbon Cost		£309.49
Annual Operational Cost		£10,265.42
Total Annual Energy Cost (Does not include Carbon)		£9,955.93
Total Annual Carbon Cost		£309.49
Total Tonnes of Carbon		19.34

Option 2 Section 4 Junction

Luminaire Types Quantity	4	1	4	1
Description				
Annual Energy Costs				
System Wattage KW	0.090	0.090	0.082	0.090
Price per KWh (pounds)	0.28	0.28	0.28	0.28
Burning Hours	4,087	4,087	4,087	4,087
Present Day Annual Energy Cost (average per lantern)	£102.99	£102.99	£93.84	£102.99
Annual Energy Cost	£411.97	£102.99	£375.35	£102.99
Annual Carbon Costs				
Total kWh per annum	368	368	335	368
Tonnes of Carbon (0.544kg/kWh) Per unit	0.20	0.20	0.18	0.20
Tonnes of Carbon	0.80	0.20	0.73	0.20
Cost per tonne of Carbon	£16.00	£16.00	£16.00	£16.00
Annual Carbon Cost	£12.81	£3.20	£11.67	£3.20
Annual Operational Cost	£424.78	£106.19	£387.02	£106.19
Total Annual Energy Cost (Does not include Carbon)	£993.30			
Total Annual Carbon Cost	£30.88			
Total Tonnes of Carbon	1.93			

Option 2 Section 5 Mainline

Luminaire Types Quantity	117
Description	Mainline
Annual Energy Costs	
System Wattage KW	0.124
Price per KWh (pounds)	0.28
Burning Hours	4,087
Present Day Annual Energy Cost (average per lantern)	£141.90
Annual Energy Cost	£16,602.37
Annual Carbon Costs	
Total kWh per annum	507
Tonnes of Carbon (0.544kg/kWh) Per unit	0.28
Tonnes of Carbon	32.26
Cost per tonne of Carbon	£16.00
Annual Carbon Cost	£516.10
Annual Operational Cost	£17,118.47
Total Annual Energy Cost (Does not include Carbon)	£16,602.37
Total Annual Carbon Cost	£516.10
Total Tonnes of Carbon	32.26

Option 2 Section 6 Mainline

Description	Luminaire Types Quantity	58
		Mainline
Annual Energy Costs		
System Wattage KW		0.159
Price per KWh (pounds)		0.28
Burning Hours		4,087
Present Day Annual Energy Cost (average per lantern)		£181.95
Annual Energy Cost		£10,553.29
Annual Carbon Costs		
Total kWh per annum		650
Tonnes of Carbon (0.544kg/kWh) Per unit		0.35
Tonnes of Carbon		20.50
Cost per tonne of Carbon		£16.00
Annual Carbon Cost		£328.06
Annual Operational Cost		£10,881.34
Total Annual Energy Cost (Does not include Carbon)		£10,553.29
Total Annual Carbon Cost		£328.06
Total Tonnes of Carbon		20.50

Option 2 Section 6 Junction

Description	Luminaire Types Quantity			
	4	1	4	1
Annual Energy Costs				
System Wattage KW	0.112	0.099	0.108	0.131
Price per KWh (pounds)	0.28	0.28	0.28	0.28
Burning Hours	4,087	4,087	4,087	4,087
Present Day Annual Energy Cost (average per lantern)	£128.17	£113.29	£123.59	£149.91
Annual Energy Cost	£512.67	£113.29	£494.36	£149.91
Annual Carbon Costs				
Total kWh per annum	458	405	441	535
Tonnes of Carbon (0.544kg/kWh) Per unit	0.25	0.22	0.24	0.29
Tonnes of Carbon	1.00	0.22	0.96	0.29
Cost per tonne of Carbon	£16.00	£16.00	£16.00	£16.00
Annual Carbon Cost	£15.94	£3.52	£15.37	£4.66
Annual Operational Cost	£528.61	£116.81	£509.73	£154.57
Total Annual Energy Cost (Does not include Carbon)	£1,270.24			
Total Annual Carbon Cost	£39.49			
Total Tonnes of Carbon	2.47			

Option 2 Section 7 Mainline

Luminaire Types Quantity		92
Description		Mainline
Annual Energy Costs		
System Wattage KW		0.155
Price per KWh (pounds)		0.28
Burning Hours		4,087
Present Day Annual Energy Cost (average per lantern)		£177.38
Annual Energy Cost		£16,318.57
Annual Carbon Costs		
Total kWh per annum		633
Tonnes of Carbon (0.544kg/kWh) Per unit		0.34
Tonnes of Carbon		31.70
Cost per tonne of Carbon		£16.00
Annual Carbon Cost		£507.27
Annual Operational Cost		£16,825.85
Total Annual Energy Cost (Does not include Carbon)		£16,318.57
Total Annual Carbon Cost		£507.27
Total Tonnes of Carbon		31.70

Option 2 Section 8 Mainline

Luminaire Types Quantity		104
Description		Mainline
Annual Energy Costs		
System Wattage KW		0.159
Price per KWh (pounds)		0.28
Burning Hours		4,087
Present Day Annual Energy Cost (average per lantern)		£181.95
Annual Energy Cost		£18,923.14
Annual Carbon Costs		
Total kWh per annum		650
Tonnes of Carbon (0.544kg/kWh) Per unit		0.35
Tonnes of Carbon		36.76
Cost per tonne of Carbon		£16.00
Annual Carbon Cost		£588.24
Annual Operational Cost		£19,511.38
Total Annual Energy Cost (Does not include Carbon)		£18,923.14
Total Annual Carbon Cost		£588.24
Total Tonnes of Carbon		36.76

Option 2 Section 8 Junction

Luminaire Types Quantity	4	1	5	1
Description				
Annual Energy Costs				
System Wattage KW	0.102	0.155	0.076	0.076
Price per KWh (pounds)	0.28	0.28	0.28	0.28
Burning Hours	4,087	4,087	4,087	4,087
Present Day Annual Energy Cost (average per lantern)	£116.72	£177.38	£86.97	£86.97
Annual Energy Cost	£466.90	£177.38	£434.86	£86.97
Annual Carbon Costs				
Total kWh per annum	417	633	311	311
Tonnes of Carbon (0.544kg/kWh) Per unit	0.23	0.34	0.17	0.17
Tonnes of Carbon	0.91	0.34	0.84	0.17
Cost per tonne of Carbon	£16.00	£16.00	£16.00	£16.00
Annual Carbon Cost	£14.51	£5.51	£13.52	£2.70
Annual Operational Cost	£481.41	£182.89	£448.37	£89.67
Total Annual Energy Cost (Does not include Carbon)	£1,166.10			
Total Annual Carbon Cost	£36.25			
Total Tonnes of Carbon	2.27			

Option 2 Section 9 Mainline

Luminaire Types Quantity	275
Description	Mainline
Annual Energy Costs	
System Wattage KW	0.148
Price per KWh (pounds)	0.28
Burning Hours	4,087
Present Day Annual Energy Cost (average per lantern)	£169.37
Annual Energy Cost	£46,575.45
Annual Carbon Costs	
Total kWh per annum	605
Tonnes of Carbon (0.544kg/kWh) Per unit	0.33
Tonnes of Carbon	90.49
Cost per tonne of Carbon	£16.00
Annual Carbon Cost	£1,447.83
Annual Operational Cost	£48,023.28
Total Annual Energy Cost (Does not include Carbon)	£46,575.45
Total Annual Carbon Cost	£1,447.83
Total Tonnes of Carbon	90.49

Option 2 Section 10 Mainline

	Luminaire Types	Quantity	19
Description			Mainline
Annual Energy Costs			
System Wattage KW			0.215
Price per KWh (pounds)			0.28
Burning Hours			4,087
Present Day Annual Energy Cost (average per lantern)			£246.04
Annual Energy Cost			£4,674.71
Annual Carbon Costs			
Total kWh per annum			879
Tonnes of Carbon (0.544kg/kWh) Per unit			0.48
Tonnes of Carbon			9.08
Cost per tonne of Carbon			£16.00
Annual Carbon Cost			£145.32
Annual Operational Cost			£4,820.03
Total Annual Energy Cost (Does not include Carbon)			£4,674.71
Total Annual Carbon Cost			£145.32
Total Tonnes of Carbon			9.08

Option 2 Section 10 Junction

	Luminaire Types	Quantity	4	1
Description				
Annual Energy Costs				
System Wattage KW			0.215	0.215
Price per KWh (pounds)			0.28	0.28
Burning Hours			4,087	4,087
Present Day Annual Energy Cost (average per lantern)			£246.04	£246.04
Annual Energy Cost			£984.15	£246.04
Annual Carbon Costs				
Total kWh per annum			879	879
Tonnes of Carbon (0.544kg/kWh) Per unit			0.48	0.48
Tonnes of Carbon			1.91	0.48
Cost per tonne of Carbon			£16.00	£16.00
Annual Carbon Cost			£30.59	£7.65
Annual Operational Cost			£1,014.74	£253.69
Total Annual Energy Cost (Does not include Carbon)			£1,230.19	£246.04
Total Annual Carbon Cost			£38.24	
Total Tonnes of Carbon			2.39	

Appendix C – Rates and frequency of maintenance interventions

Description	Detailed Description	Interval of maintenance Cycle	Cycles	No of Cycles	Qty per Cycle	Quantity attend per shift	Number of shifts	Unit	Rate	Work Cycle Cost
Replacement of Luminaire with LED Unit	Replacement of luminaires at end of life with replacement LED luminaires. Cost make up 12 x £1000 item price + 1 x £935 shift price	12 Years	@ 18:	1	1,109	20	56	each	£1,000.00	£1,109,000.00
Luminaire Clean	Cleaning internal and external surfaces	at electrical testing	@ 6, 12, 18, 24 & 30	5	1109	60	19	each	£41.00	£45,469.00
Visual Inspection of luminaire	Cleaning, adjustment and visual inspection of mechanical components, electrical components and wiring	at electrical testing	@ 6, 12, 18, 24 & 30	5	1109	60	19	each	£18.70	£20,738.30
Visual Inspection of column	Visual inspection of condition of column, door and fixings, electrical components and wiring	at electrical testing	@ 6, 12, 18, 24 & 30	5	1145	60	20	each	£18.70	£21,411.50
Visual Inspection of feeder pillar	Visual inspection of condition of enclosure and support systems: electrical components and wiring	at electrical testing	@ 6, 12, 18, 24 & 30	5	18	5	4	each	£0.00	£0.00
Electrical Testing: column and cables	Complete electrical test and inspection Every 6 years (maximum)	6 Years (max)	@ 6, 12, 18, 24 & 30	5	1145	60	20	each	£112.00	£128,240.00
Electrical Testing: feeder pillar	Complete electrical test and inspection Every 6 years (maximum) expiry of fatigue design life	6 Years (max)	@ 6, 12, 18, 24 & 30	5	18	2	9	each	£0.00	£0.00
Structural Testing of column	rigorous column inspection/testing, especially after	6 Years (max)	@ 12, 18, 24 & 30	4	1145	50	23	each	£156.00	£178,620.00
Remedial Works	Allowance for attendance at non-routine repairs, e.g. door off, lantern cover off, solitary lamp outage	As required	nominal 3 @ 15, 21 & 27 yrs	3	88.72	10	9	8% Of Cycle Costs	£100.00	£8,872.00

Option 1 Maintenance Breakdown Mainline

Option 1 (Mainline)		TM	Works cost
	Remedial Works	£27,000.00	£26,616.00
	Year 6	£20,000.00	£215,858.80
	Year 12	£23,000.00	£394,478.80
	Year 18	£56,000.00	£1,503,478.80
	Year 24	£23,000.00	£394,478.80
	Year 30	£23,000.00	£394,478.80
	Total	£172,000.00	£2,929,390.00
	Total Maintenance cost over installation life	£3,101,390.00	
	Appraisal Period (years)	30	
	Average Maintenance cost per annum	£103,379.67	

Option 1 Maintenance Breakdown Junction

Option 1 (Slips/Merge)		TM	Works cost
	Remedial Works	£3,000.00	£864.00
	Year 6	£7,000.00	£6,854.40
	Year 12	£7,000.00	£12,470.40
	Year 18	£7,000.00	£48,470.40
	Year 24	£7,000.00	£12,470.40
	Year 30	£7,000.00	£12,470.40
	Total	£38,000.00	£93,600.00

	Total Maintenance cost over installation life	£131,600.00
	Appraisal Period (years)	30
	Average Maintenance cost per annum	£4,386.67

Option 2 Section 1 Maintenance Breakdown Mainline

Option 2 Section 1(Mainline)		TM	Works cost
	Remedial Works	£3,000.00	£2,160.00
	Year 6	£2,000.00	£17,136.00
	Year 12	£2,000.00	£31,176.00
	Year 18	£5,000.00	£121,176.00
	Year 24	£2,000.00	£31,176.00
	Year 30	£2,000.00	£31,176.00
	Total	£16,000.00	£234,000.00
	Total Maintenance cost over installation life	£250,000.00	
	Appraisal Period (years)	30	
	Average Maintenance cost per annum	£8,333.33	

Option 2 Section 2 Maintenance Breakdown Mainline

Option 2 Section 2 (Mainline)		TM	Works cost
	Remedial Works	£3,000.00	£1,104.00
	Year 6	£3,000.00	£8,758.40
	Year 12	£3,000.00	£15,934.40
	Year 18	£3,000.00	£61,934.40
	Year 24	£3,000.00	£15,934.40
	Year 30	£3,000.00	£15,934.40
	Total	£18,000.00	£119,600.00

	Total Maintenance cost over installation life	£137,600.00
	Appraisal Period (years)	30
	Average Maintenance cost per annum	£4,586.67

Option 2 Section 3 Maintenance Breakdown Mainline

Option 2 Section 3(Mainline)		TM	Works cost
	Remedial Works	£3,000.00	£816.00
	Year 6	£1,000.00	£6,473.60
	Year 12	£1,000.00	£11,777.60
	Year 18	£2,000.00	£45,777.60
	Year 24	£1,000.00	£11,777.60
	Year 30	£1,000.00	£11,777.60
	Total	£9,000.00	£88,400.00
	Total Maintenance cost over installation life	£97,400.00	
	Appraisal Period (years)	30	
	Average Maintenance cost per annum	£3,246.67	

Option 2 Section 4 Maintenance Breakdown Mainline

Option 2 Section 4(Mainline)		TM	Works cost
	Remedial Works	£3,000.00	£1,440.00
	Year 6	£1,000.00	£11,424.00
	Year 12	£2,000.00	£20,784.00
	Year 18	£3,000.00	£80,784.00
	Year 24	£2,000.00	£20,784.00
	Year 30	£2,000.00	£20,784.00
	Total	£13,000.00	£156,000.00
	Total Maintenance cost over installation life	£169,000.00	

	Appraisal Period (years)	30
	Average Maintenance cost per annum	£5,633.33

Option 2 Section 4 Maintenance Breakdown Junction

Option 2 Section 4(Slips/Merge)		TM	Works cost
	Remedial Works	£3,000.00	£240.00
	Year 6	£2,000.00	£1,904.00
	Year 12	£2,000.00	£3,464.00
	Year 18	£2,000.00	£13,464.00
	Year 24	£2,000.00	£3,464.00
	Year 30	£2,000.00	£3,464.00
	Total	£13,000.00	£26,000.00
	Total Maintenance cost over installation life	£39,000.00	
	Appraisal Period (years)	30	
	Average Maintenance cost per annum	£1,300.00	

Option 2 Section 5 Maintenance Breakdown Mainline

Option 2 Section 5(Mainline)		TM	Works cost
	Remedial Works	£3,000.00	£2,808.00
	Year 6	£2,000.00	£22,276.80
	Year 12	£3,000.00	£40,528.80
	Year 18	£6,000.00	£157,528.80
	Year 24	£3,000.00	£40,528.80
	Year 30	£3,000.00	£40,528.80
	Total	£20,000.00	£304,200.00
	Total Maintenance cost over installation life	£324,200.00	

	Appraisal Period (years)	30
	Average Maintenance cost per annum	£10,806.67

Option 2 Section 6 Maintenance Breakdown Mainline

Option 2 Section 6(Mainline)		TM	Works cost
	Remedial Works	£3,000.00	£1,392.00
	Year 6	£1,000.00	£11,043.20
	Year 12	£2,000.00	£20,091.20
	Year 18	£3,000.00	£78,091.20
	Year 24	£2,000.00	£20,091.20
	Year 30	£2,000.00	£20,091.20
	Total	£13,000.00	£150,800.00
	Total Maintenance cost over installation life	£163,800.00	
	Appraisal Period (years)	30	
	Average Maintenance cost per annum	£5,460.00	

Option 2 Section 6 Maintenance Breakdown Junction

Option 2 Section 6(Slips/Merge)		TM	Works cost
	Remedial Works	£3,000.00	£240.00
	Year 6	£2,000.00	£1,904.00
	Year 12	£2,000.00	£3,464.00
	Year 18	£2,000.00	£13,464.00
	Year 24	£2,000.00	£3,464.00
	Year 30	£2,000.00	£3,464.00
	Total	£13,000.00	£26,000.00
	Total Maintenance cost over installation life	£39,000.00	

	Appraisal Period (years)	30
	Average Maintenance cost per annum	£1,300.00

Option 2 Section 7 Maintenance Breakdown Mainline

Option 2 Section 7(Mainline)		TM	Works cost
	Remedial Works	£3,000.00	£2,208.00
	Year 6	£2,000.00	£17,516.80
	Year 12	£2,000.00	£31,868.80
	Year 18	£5,000.00	£123,868.80
	Year 24	£2,000.00	£31,868.80
	Year 30	£2,000.00	£31,868.80
	Total	£16,000.00	£239,200.00
	Total Maintenance cost over installation life	£255,200.00	
	Appraisal Period (years)	30	
	Average Maintenance cost per annum	£8,506.67	

Option 2 Section 8 Maintenance Breakdown Mainline

Option 2 Section 8(Mainline)		TM	Works cost
	Remedial Works	£3,000.00	£2,496.00
	Year 6	£2,000.00	£19,801.60
	Year 12	£3,000.00	£36,025.60
	Year 18	£6,000.00	£140,025.60
	Year 24	£3,000.00	£36,025.60
	Year 30	£3,000.00	£36,025.60
	Total	£20,000.00	£270,400.00
	Total Maintenance cost over installation life	£290,400.00	

	Appraisal Period (years)	30
	Average Maintenance cost per annum	£9,680.00

Option 2 Section 8 Maintenance Breakdown Junction

Option 2 Section 8(Slips/Merge)		TM	Works cost
	Remedial Works	£3,000.00	£264.00
	Year 6	£2,000.00	£2,094.40
	Year 12	£2,000.00	£3,810.40
	Year 18	£2,000.00	£14,810.40
	Year 24	£2,000.00	£3,810.40
	Year 30	£2,000.00	£3,810.40
	Total	£13,000.00	£28,600.00
	Total Maintenance cost over installation life	£41,600.00	
	Appraisal Period (years)	30	
	Average Maintenance cost per annum	£1,386.67	

Option 2 Section 9 Maintenance Breakdown Mainline

Option 2 Section 9(Mainline)		TM	Works cost
	Remedial Works	£9,000.00	£6,600.00
	Year 6	£5,000.00	£52,360.00
	Year 12	£6,000.00	£95,260.00
	Year 18	£14,000.00	£370,260.00
	Year 24	£6,000.00	£95,260.00
	Year 30	£6,000.00	£95,260.00
	Total	£46,000.00	£715,000.00
	Total Maintenance cost over installation life	£761,000.00	

	Appraisal Period (years)	30
	Average Maintenance cost per annum	£25,366.67

Option 2 Section 10 Maintenance Breakdown Mainline

Option 2 Section 10(Mainline)		TM	Works cost
	Remedial Works	£3,000.00	£456.00
	Year 6	£1,000.00	£3,617.60
	Year 12	£1,000.00	£6,581.60
	Year 18	£1,000.00	£25,581.60
	Year 24	£1,000.00	£6,581.60
	Year 30	£1,000.00	£6,581.60
	Total	£8,000.00	£49,400.00
	Total Maintenance cost over installation life	£57,400.00	
	Appraisal Period (years)	30	
	Average Maintenance cost per annum	£1,913.33	

Option 2 Section 10 Maintenance Breakdown Junction

Option 2 Section 10(Slips/Merge)		TM	Works cost
	Remedial Works	£3,000.00	£120.00
	Year 6	£1,000.00	£952.00
	Year 12	£1,000.00	£1,732.00
	Year 18	£1,000.00	£6,732.00
	Year 24	£1,000.00	£1,732.00
	Year 30	£1,000.00	£1,732.00
	Total	£8,000.00	£13,000.00
	Total Maintenance cost over installation life	£21,000.00	

	Appraisal Period (years)	30
	Average Maintenance cost per annum	£700.00

Appendix D - RSE REPORT

M62 J18-22 TA 501 ASSESSMENT – ROAD SAFETY ENGINEER REPORT

1. COLLISION DATA SOURCE

Personal injury collision (PIC) data was provided by National Highways but when compared with validated STATS19 PIC data from the Department for Transport (DfT) website it was found to be incomplete. To allow accurate analysis of the full five-year period 2019-2023 the decision was made to use the DfT validated STATS19 data.

2. PERSONAL INJURY COLLISION DATA ANALYSIS

Eight-eight PICs were reported on the M62 within the scheme extents. These PICs are summarised by year and severity in Table 1 below:

PERIOD	COLLISIONS				CASUALTIES			
	FTL	SER	SLT	TOTAL	FTL	SER	SLT	TOTAL
01-01-19 – 31-12-19	1	3	24	28	1	3	43	47
01-01-20 – 31-12-20	0	1	6	7	0	1	12	13
01-01-21 – 31-12-21	0	6	16	22	0	8	23	31
01-01-22 – 31-12-22	0	3	8	11	0	3	16	19
01-01-23 – 31-12-23	2	4	14	20	2	7	36	45
TOTAL	3	17	68	88	3	22	130	155

Table 1 – Summary of collisions for the five-year period 2019-2023

The PICs were analysed and can be briefly summarised as follows:

- the average number of collisions was 17.6 per year
- the average number of casualties was 31 per year
- 57 collisions occurred in daylight (65%)
- 31 collisions occurred in darkness (35%)

3. DARKNESS PIC SAVING

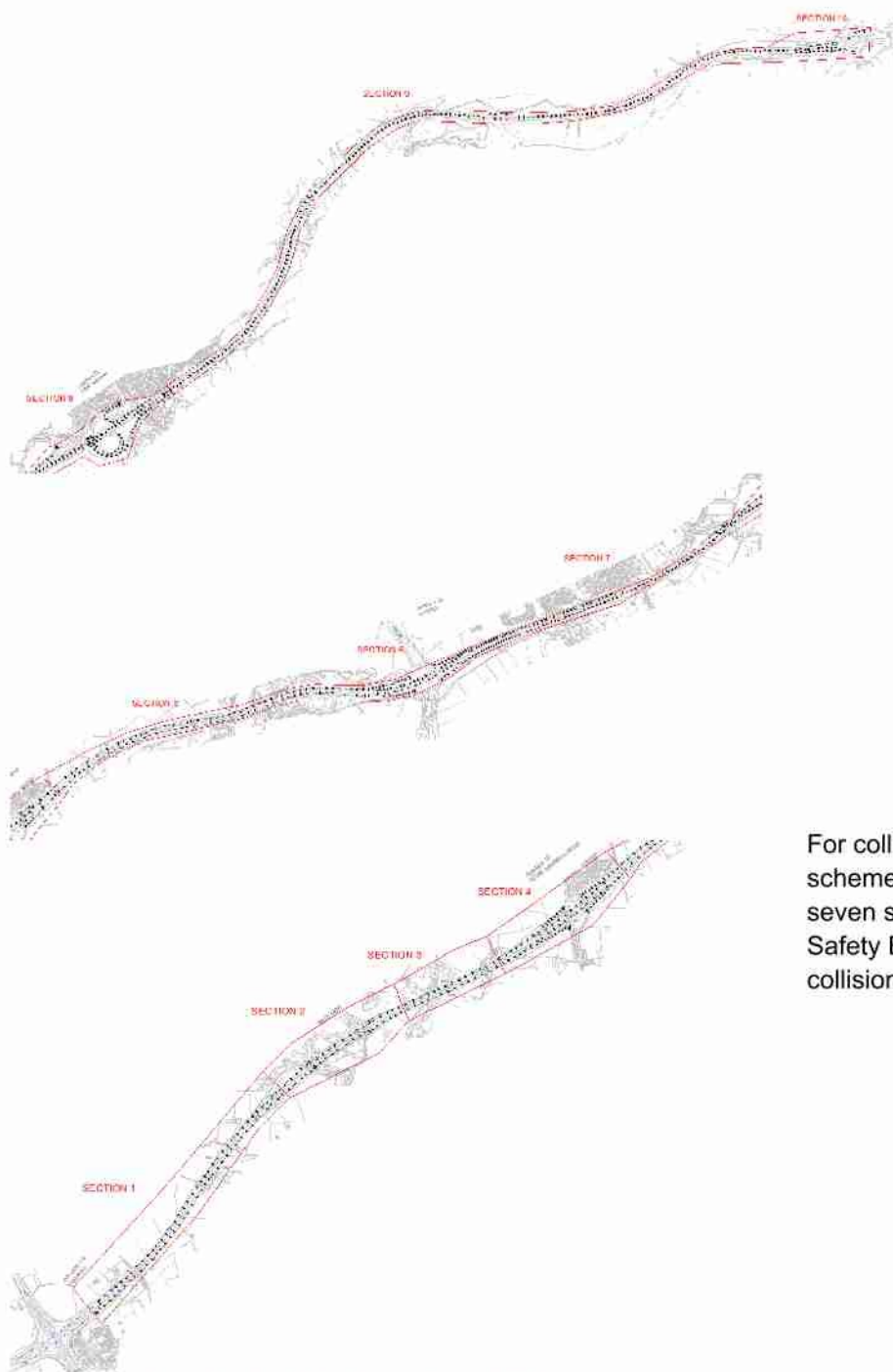
The STATS 19 dataset from the DfT website does not contain detailed text description of collision circumstances, so it was not possible to identify and exclude those where driver gross negligence (DGN) was a significant contributory factor. Therefore, the average number of darkness PICs during the five-year study period was 6.2 per year.

The likely reduction in PICs in darkness on a motorway with lighting has been taken as 10% (IAN 167/12 'Guidance for the Removal of Road Lighting' Highways Agency 2012).

Based on the darkness PIC saving calculation method for renewing lighting on a lit link / junction, as given in TA 501, the predicted PIC saving is:

$6.2 \times (10 / (100 - 10)) = 0.69$ PICs saved per year by renewing lighting.

M62 J18-22 SECTION 1 TA 501 ASSESSMENT – ROAD SAFETY ENGINEER REPORT



For collision analysis, the scheme has been split into seven sections. This Road Safety Engineer report covers collisions reported in **Section 1**.

1. COLLISION DATA SOURCE

Personal injury collision (PIC) data was provided by National Highways but when compared with validated STATS19 PIC data from the Department for Transport (DfT) website it was found to be incomplete. To allow accurate analysis of the full five-year period 2019-2023 the decision was made to use the DfT validated STATS19 data.

2. PERSONAL INJURY COLLISION DATA ANALYSIS

Fourteen PICs were reported on the M62 within the extents of Section 1. These PICs are summarised by year and severity in Table 1 below:

PERIOD	COLLISIONS				CASUALTIES			
	FTL	SER	SLT	TOTAL	FTL	SER	SLT	TOTAL
01-01-19 – 31-12-19	0	0	5	5	0	0	6	6
01-01-20 – 31-12-20	0	0	1	1	0	0	1	1
01-01-21 – 31-12-21	0	1	2	3	0	2	3	5
01-01-22 – 31-12-22	0	0	2	2	0	0	3	3
01-01-23 – 31-12-23	0	1	2	3	0	1	6	7
TOTAL	0	2	12	14	0	3	19	22

Table 1 – Summary of collisions for the five-year period 2019-2023

The PICs were analysed and can be briefly summarised as follows:

- the average number of collisions was 2.8 per year
- the average number of casualties was 4.4 per year
- Eight collisions occurred in daylight (57%)
- Six collisions occurred in darkness (43%)

3. DARKNESS PIC SAVING

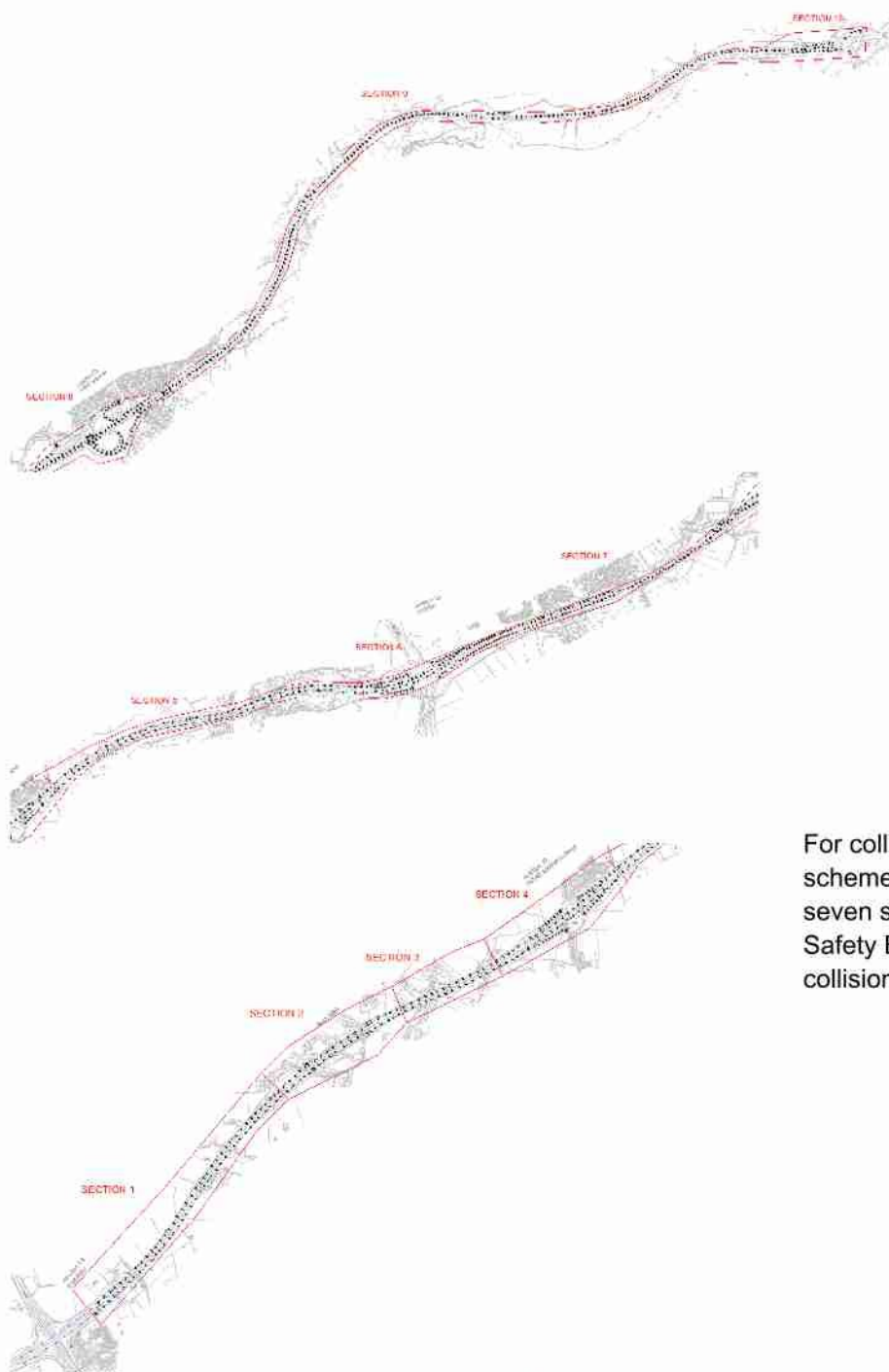
The STATS 19 dataset from the DfT website does not contain detailed text description of collision circumstances, so it was not possible to identify and exclude those where driver gross negligence (DGN) was a significant contributory factor. Therefore, the average number of darkness PICs during the five-year study period was 1.2 per year.

The likely reduction in PICs in darkness on a motorway with lighting has been taken as 10% (IAN 167/12 'Guidance for the Removal of Road Lighting' Highways Agency 2012).

Based on the darkness PIC saving calculation method for renewing lighting on a lit link / junction, as given in TA 501, the predicted PIC saving is:

$1.2 \times (10 / (100 - 10)) = 0.13$ PICs saved per year by renewing lighting.

M62 J18-22 SECTION 2 TA 501 ASSESSMENT – ROAD SAFETY ENGINEER REPORT



For collision analysis, the scheme has been split into seven sections. This Road Safety Engineer report covers collisions reported in **Section 2**.

1. COLLISION DATA SOURCE

Personal injury collision (PIC) data was provided by National Highways but when compared with validated STATS19 PIC data from the Department for Transport (DfT) website it was found to be incomplete. To allow accurate analysis of the full five-year period 2019-2023 the decision was made to use the DfT validated STATS19 data.

2. PERSONAL INJURY COLLISION DATA ANALYSIS

Four PICs were reported on the M62 within the extents of Section 2. These PICs are summarised by year and severity in Table 1 below:

PERIOD	COLLISIONS				CASUALTIES			
	FTL	SER	SLT	TOTAL	FTL	SER	SLT	TOTAL
01-01-19 – 31-12-19	1	0	0	1	1	0	0	1
01-01-20 – 31-12-20	0	0	0	0	0	0	0	0
01-01-21 – 31-12-21	0	0	1	1	0	0	1	1
01-01-22 – 31-12-22	0	0	1	1	0	0	1	1
01-01-23 – 31-12-23	0	0	1	1	0	0	2	2
TOTAL	1	0	3	4	1	0	4	5

Table 1 – Summary of collisions for the five-year period 2019-2023

The PICs were analysed and can be briefly summarised as follows:

- the average number of collisions was 0.8 per year
- the average number of casualties was 1 per year
- Two collisions occurred in daylight (50%)
- Two collisions occurred in darkness (50%)

3. DARKNESS PIC SAVING

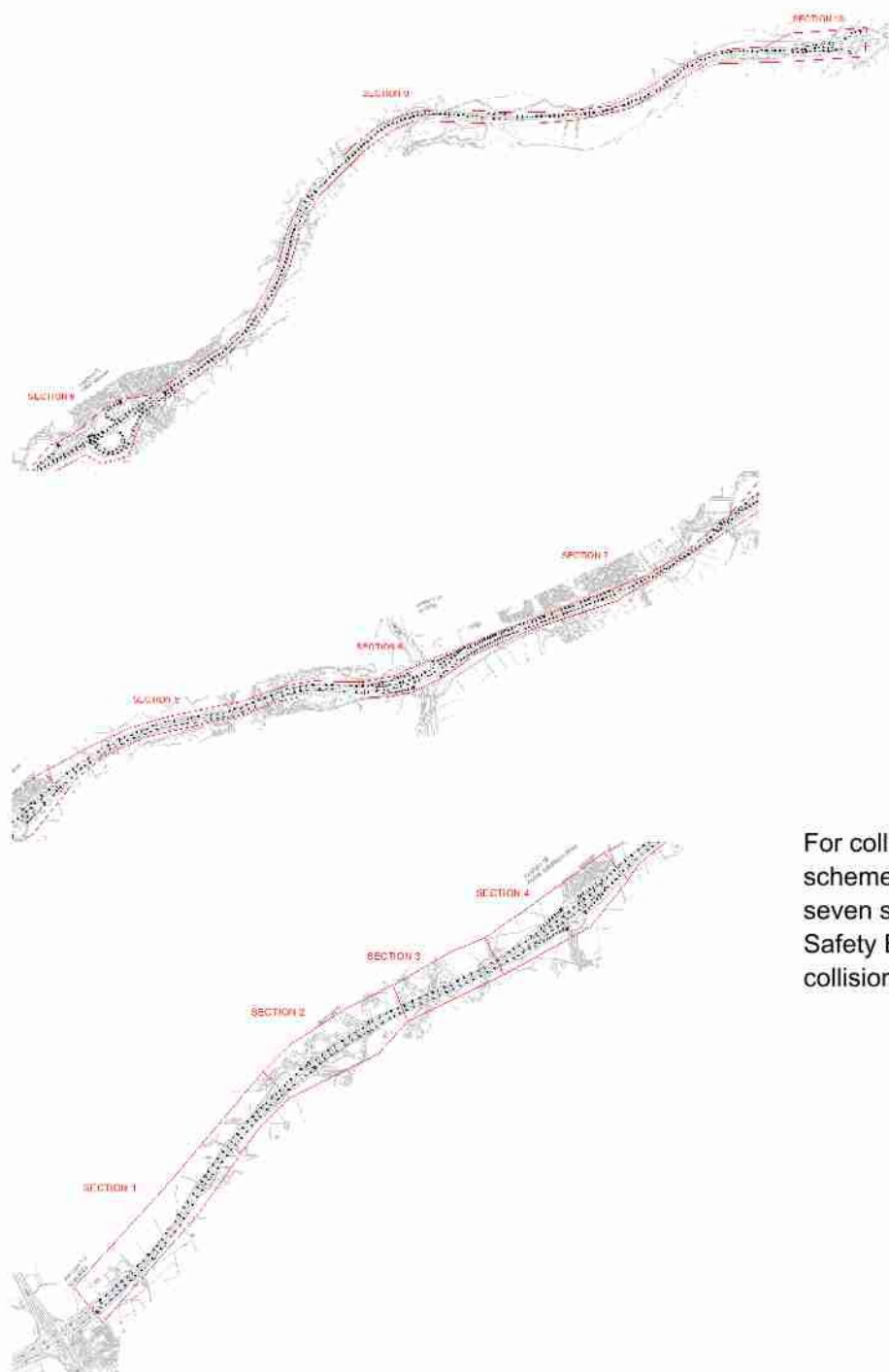
The STATS 19 dataset from the DfT website does not contain detailed text description of collision circumstances, so it was not possible to identify and exclude those where driver gross negligence (DGN) was a significant contributory factor. Therefore, the average number of darkness PICs during the five-year study period was 0.4 per year.

The likely reduction in PICs in darkness on a motorway with lighting has been taken as 10% (IAN 167/12 'Guidance for the Removal of Road Lighting' Highways Agency 2012).

Based on the darkness PIC saving calculation method for renewing lighting on a lit link / junction, as given in TA 501, the predicted PIC saving is:

$0.4 \times (10 / (100 - 10)) = 0.04$ PICs saved per year by renewing lighting.

M62 J18-22 SECTION 3 TA 501 ASSESSMENT – ROAD SAFETY ENGINEER REPORT



For collision analysis, the scheme has been split into seven sections. This Road Safety Engineer report covers collisions reported in **Section 3**.

1. COLLISION DATA SOURCE

Personal injury collision (PIC) data was provided by National Highways but when compared with validated STATS19 PIC data from the Department for Transport (DfT) website it was found to be incomplete. To allow accurate analysis of the full five-year period 2019-2023 the decision was made to use the DfT validated STATS19 data.

2. PERSONAL INJURY COLLISION DATA ANALYSIS

Two PICs were reported on the M62 within the extents of Section 3. These PICs are summarised by year and severity in Table 1 below:

PERIOD	COLLISIONS				CASUALTIES			
	FTL	SER	SLT	TOTAL	FTL	SER	SLT	TOTAL
01-01-19 – 31-12-19	0	0	0	0	0	0	0	0
01-01-20 – 31-12-20	0	0	0	0	0	0	0	0
01-01-21 – 31-12-21	0	0	1	1	0	0	2	2
01-01-22 – 31-12-22	0	0	0	0	0	0	0	0
01-01-23 – 31-12-23	0	0	1	1	0	0	1	1
TOTAL	0	0	2	2	0	0	3	3

Table 1 – Summary of collisions for the five-year period 2019-2023

The PICs were analysed and can be briefly summarised as follows:

- the average number of collisions was 0.4 per year
- the average number of casualties was 0.6 per year
- Both collisions occurred in daylight (100%)

3. DARKNESS PIC SAVING

No PICs that occurred in darkness were reported within the extents of Section 3.

M62 J18-22 SECTION 4 TA 501 ASSESSMENT – ROAD SAFETY ENGINEER REPORT



For collision analysis, the scheme has been split into seven sections. This Road Safety Engineer report covers collisions reported in **Section 4**.

1. COLLISION DATA SOURCE

Personal injury collision (PIC) data was provided by National Highways but when compared with validated STATS19 PIC data from the Department for Transport (DfT) website it was found to be incomplete. To allow accurate analysis of the full five-year period 2019-2023 the decision was made to use the DfT validated STATS19 data.

2. PERSONAL INJURY COLLISION DATA ANALYSIS

Eight PICs were reported on the M62 within the extents of Section 4. These PICs are summarised by year and severity in Table 1 below:

PERIOD	COLLISIONS				CASUALTIES			
	FTL	SER	SLT	TOTAL	FTL	SER	SLT	TOTAL
01-01-19 – 31-12-19	0	0	3	3	0	0	4	4
01-01-20 – 31-12-20	0	0	2	2	0	0	8	8
01-01-21 – 31-12-21	0	0	2	2	0	0	2	2
01-01-22 – 31-12-22	0	0	0	0	0	0	0	0
01-01-23 – 31-12-23	0	0	1	1	0	0	1	1
TOTAL	0	0	8	8	0	0	15	15

Table 1 – Summary of collisions for the five-year period 2019-2023

The PICs were analysed and can be briefly summarised as follows:

- the average number of collisions was 1.6 per year
- the average number of casualties was 3 per year
- Five collisions occurred in daylight (63%)
- Three collisions occurred in darkness (38%)

3. DARKNESS PIC SAVING

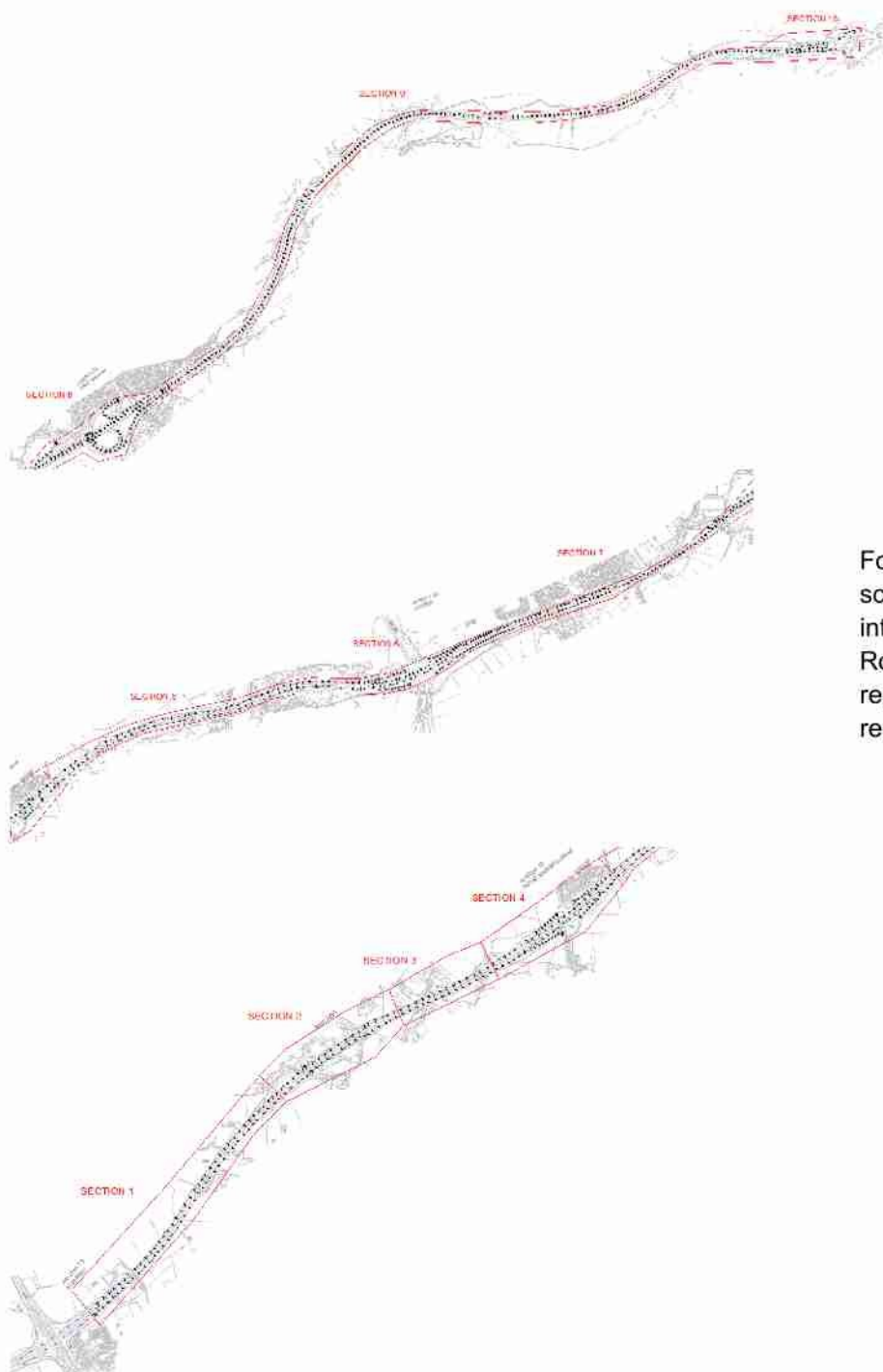
The STATS 19 dataset from the DfT website does not contain detailed text description of collision circumstances, so it was not possible to identify and exclude those where driver gross negligence (DGN) was a significant contributory factor. Therefore, the average number of darkness PICs during the five-year study period was 0.6 per year.

The likely reduction in PICs in darkness on a motorway with lighting has been taken as 10% (IAN 167/12 'Guidance for the Removal of Road Lighting' Highways Agency 2012).

Based on the darkness PIC saving calculation method for renewing lighting on a lit link / junction, as given in TA 501, the predicted PIC saving is:

$0.6 \times (10 / (100 - 10)) = 0.07$ PICs saved per year by renewing lighting.

M62 J18-22 SECTION 5 TA 501 ASSESSMENT – ROAD SAFETY ENGINEER REPORT



For collision analysis, the scheme has been split into seven sections. This Road Safety Engineer report covers collisions reported in **Section 5**.

1. COLLISION DATA SOURCE

Personal injury collision (PIC) data was provided by National Highways but when compared with validated STATS19 PIC data from the Department for Transport (DfT) website it was found to be incomplete. To allow accurate analysis of the full five-year period 2019-2023 the decision was made to use the DfT validated STATS19 data.

2. PERSONAL INJURY COLLISION DATA ANALYSIS

Eleven PICs were reported on the M62 within the extents of Section 5. These PICs are summarised by year and severity in Table 1 below:

PERIOD	COLLISIONS				CASUALTIES			
	FTL	SER	SLT	TOTAL	FTL	SER	SLT	TOTAL
01-01-19 – 31-12-19	0	0	2	2	0	0	5	5
01-01-20 – 31-12-20	0	0	1	1	0	0	1	1
01-01-21 – 31-12-21	0	1	4	5	0	2	6	8
01-01-22 – 31-12-22	0	0	1	1	0	0	1	1
01-01-23 – 31-12-23	0	1	1	2	0	1	5	6
TOTAL	0	2	9	11	0	3	18	21

Table 1 – Summary of collisions for the five-year period 2019-2023

The PICs were analysed and can be briefly summarised as follows:

- the average number of collisions was 2.2 per year
- the average number of casualties was 4.2 per year
- Six collisions occurred in daylight (55%)
- Five collisions occurred in darkness (45%)

3. DARKNESS PIC SAVING

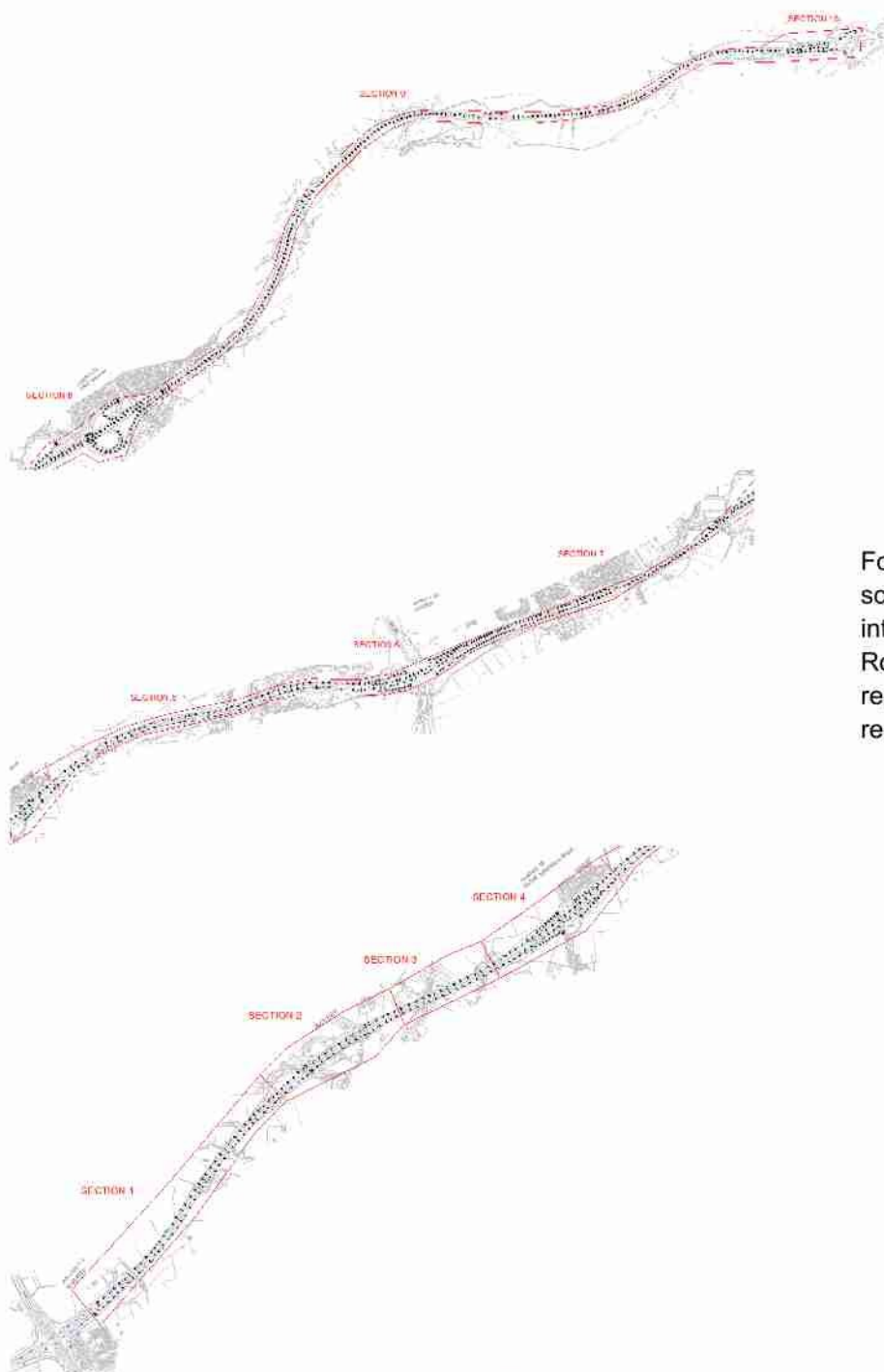
The STATS 19 dataset from the DfT website does not contain detailed text description of collision circumstances, so it was not possible to identify and exclude those where driver gross negligence (DGN) was a significant contributory factor. Therefore, the average number of darkness PICs during the five-year study period was 1 per year.

The likely reduction in PICs in darkness on a motorway with lighting has been taken as 10% (IAN 167/12 'Guidance for the Removal of Road Lighting' Highways Agency 2012).

Based on the darkness PIC saving calculation method for renewing lighting on a lit link / junction, as given in TA 501, the predicted PIC saving is:

$1 \times (10 / (100 - 10)) = 0.11$ PICs saved per year by renewing lighting.

M62 J18-22 SECTION 6 TA 501 ASSESSMENT – ROAD SAFETY ENGINEER REPORT



For collision analysis, the scheme has been split into seven sections. This Road Safety Engineer report covers collisions reported in **Section 6**.

1. COLLISION DATA SOURCE

Personal injury collision (PIC) data was provided by National Highways but when compared with validated STATS19 PIC data from the Department for Transport (DfT) website it was found to be incomplete. To allow accurate analysis of the full five-year period 2019-2023 the decision was made to use the DfT validated STATS19 data.

2. PERSONAL INJURY COLLISION DATA ANALYSIS

Six PICs were reported on the M62 within the extents of Section 6. These PICs are summarised by year and severity in Table 1 below:

PERIOD	COLLISIONS				CASUALTIES			
	FTL	SER	SLT	TOTAL	FTL	SER	SLT	TOTAL
01-01-19 – 31-12-19	0	0	2	2	0	0	2	2
01-01-20 – 31-12-20	0	0	2	2	0	0	2	2
01-01-21 – 31-12-21	0	0	2	2	0	0	2	2
01-01-22 – 31-12-22	0	0	0	0	0	0	0	0
01-01-23 – 31-12-23	0	0	0	0	0	0	0	0
TOTAL	0	0	6	6	0	0	6	6

Table 1 – Summary of collisions for the five-year period 2019-2023

The PICs were analysed and can be briefly summarised as follows:

- the average number of collisions was 1.2 per year
- the average number of casualties was 1.2 per year
- Five collisions occurred in daylight (83%)
- One collision occurred in darkness (17%)

3. DARKNESS PIC SAVING

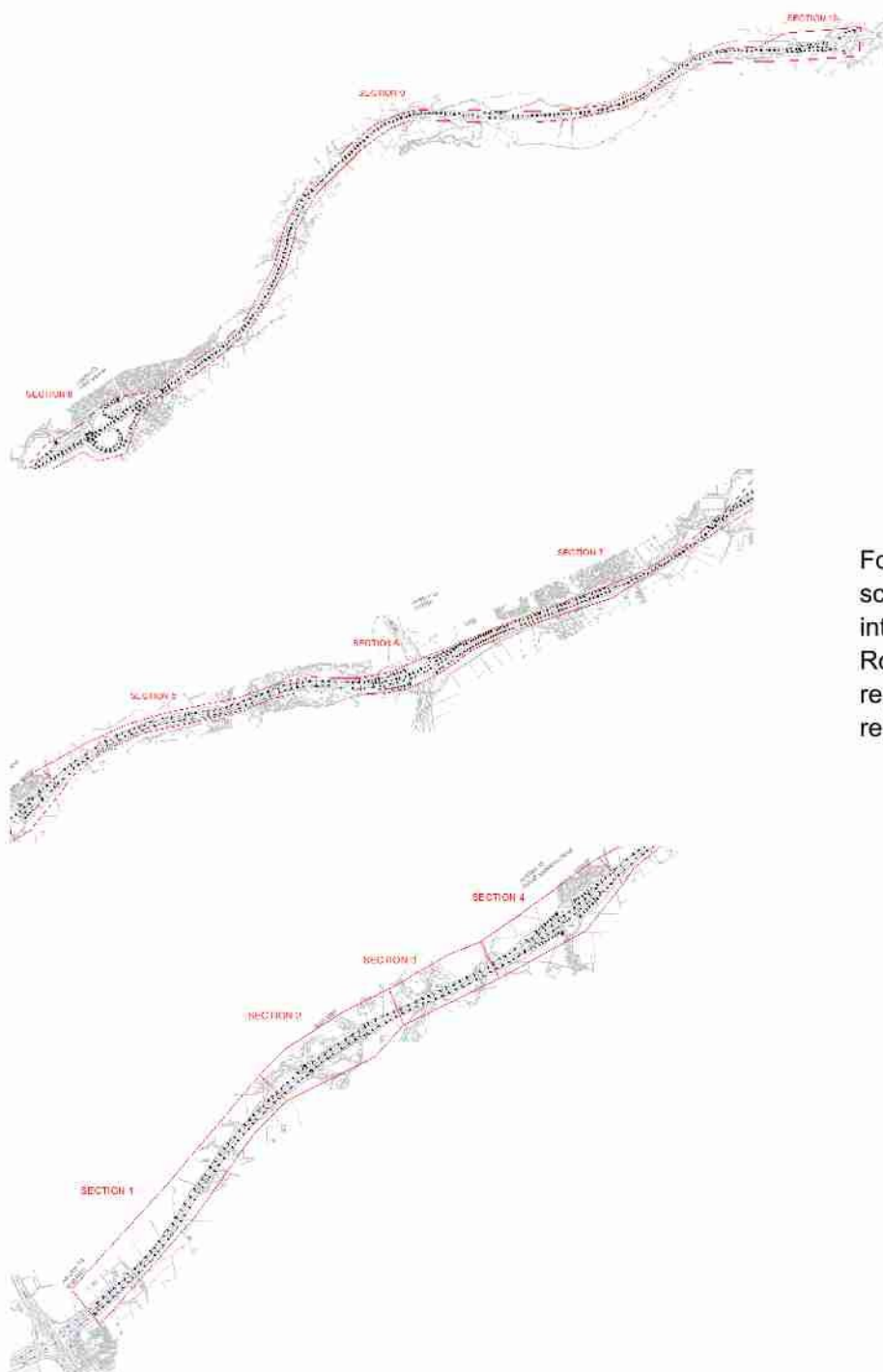
The STATS 19 dataset from the DfT website does not contain detailed text description of collision circumstances, so it was not possible to identify and exclude those where driver gross negligence (DGN) was a significant contributory factor. Therefore, the average number of darkness PICs during the five-year study period was 0.2 per year.

The likely reduction in PICs in darkness on a motorway with lighting has been taken as 10% (IAN 167/12 'Guidance for the Removal of Road Lighting' Highways Agency 2012).

Based on the darkness PIC saving calculation method for renewing lighting on a lit link / junction, as given in TA 501, the predicted PIC saving is:

$0.2 \times (10 / (100 - 10)) = 0.02$ PICs saved per year by renewing lighting.

M62 J18-22 SECTION 7 TA 501 ASSESSMENT – ROAD SAFETY ENGINEER REPORT



For collision analysis, the scheme has been split into seven sections. This Road Safety Engineer report covers collisions reported in **Section 7**.

1. COLLISION DATA SOURCE

Personal injury collision (PIC) data was provided by National Highways but when compared with validated STATS19 PIC data from the Department for Transport (DfT) website it was found to be incomplete. To allow accurate analysis of the full five-year period 2019-2023 the decision was made to use the DfT validated STATS19 data.

2. PERSONAL INJURY COLLISION DATA ANALYSIS

Three PICs were reported on the M62 within the extents of Section 7. These PICs are summarised by year and severity in Table 1 below:

PERIOD	COLLISIONS				CASUALTIES			
	FTL	SER	SLT	TOTAL	FTL	SER	SLT	TOTAL
01-01-19 – 31-12-19	0	0	0	0	0	0	0	0
01-01-20 – 31-12-20	0	0	0	0	0	0	0	0
01-01-21 – 31-12-21	0	0	0	0	0	0	0	0
01-01-22 – 31-12-22	0	0	1	1	0	0	4	4
01-01-23 – 31-12-23	1	1	0	2	1	3	1	5
TOTAL	1	1	1	3	1	3	5	9

Table 1 – Summary of collisions for the five-year period 2019-2023

The PICs were analysed and can be briefly summarised as follows:

- the average number of collisions was 0.6 per year
- the average number of casualties was 1.8 per year
- One collision occurred in daylight (33%)
- Two collisions occurred in darkness (67%)

3. DARKNESS PIC SAVING

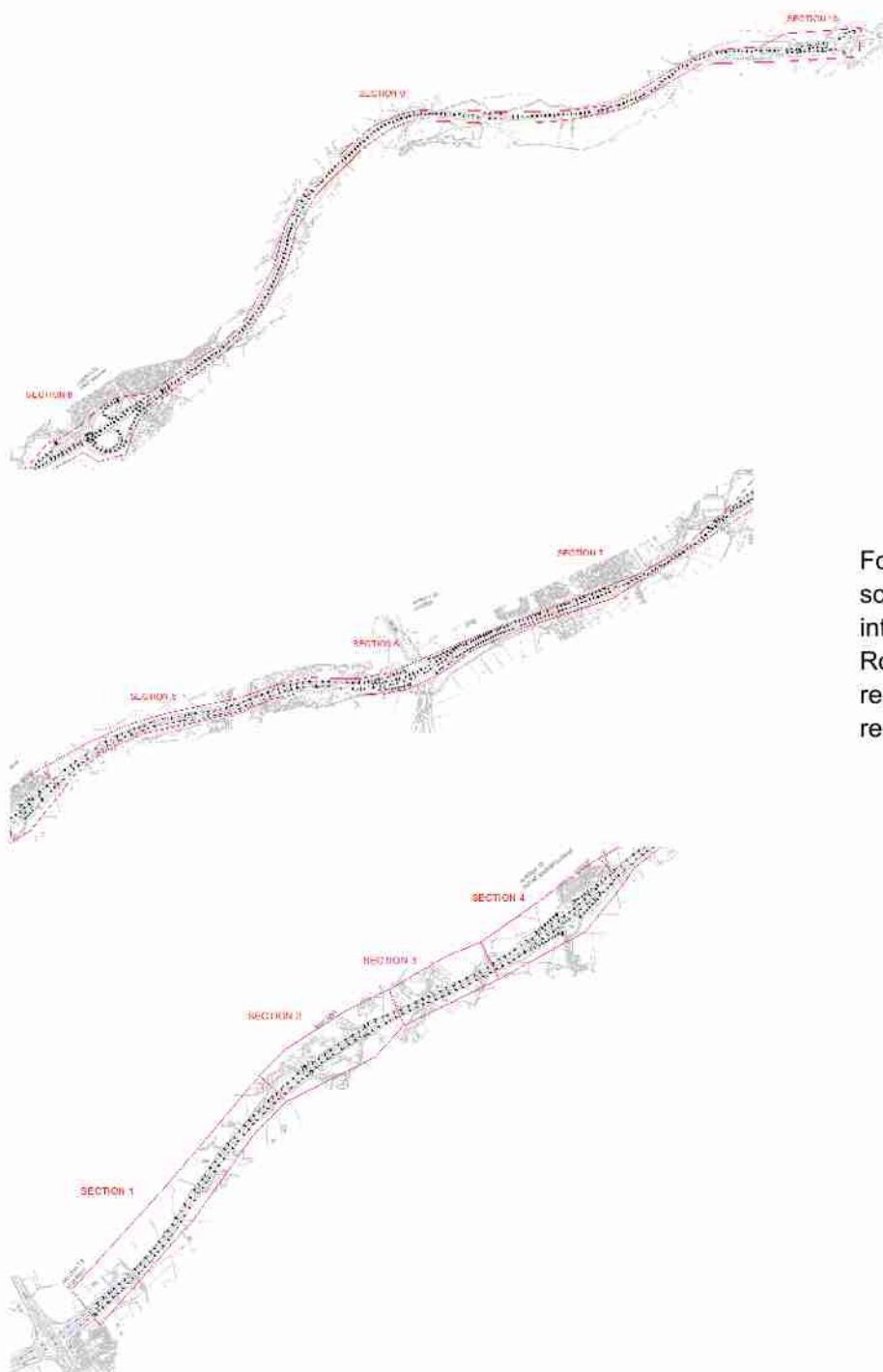
The STATS 19 dataset from the DfT website does not contain detailed text description of collision circumstances, so it was not possible to identify and exclude those where driver gross negligence (DGN) was a significant contributory factor. Therefore, the average number of darkness PICs during the five-year study period was 0.4 per year.

The likely reduction in PICs in darkness on a motorway with lighting has been taken as 10% (IAN 167/12 'Guidance for the Removal of Road Lighting' Highways Agency 2012).

Based on the darkness PIC saving calculation method for renewing lighting on a lit link / junction, as given in TA 501, the predicted PIC saving is:

$0.4 \times (10 / (100 - 10)) = 0.04$ PICs saved per year by renewing lighting.

M62 J18-22 SECTION 8 TA 501 ASSESSMENT – ROAD SAFETY ENGINEER REPORT



For collision analysis, the scheme has been split into seven sections. This Road Safety Engineer report covers collisions reported in **Section 8**.

1. COLLISION DATA SOURCE

Personal injury collision (PIC) data was provided by National Highways but when compared with validated STATS19 PIC data from the Department for Transport (DfT) website it was found to be incomplete. To allow accurate analysis of the full five-year period 2019-2023 the decision was made to use the DfT validated STATS19 data.

2. PERSONAL INJURY COLLISION DATA ANALYSIS

Five PICs were reported on the M62 within the extents of Section 8. These PICs are summarised by year and severity in Table 1 below:

PERIOD	COLLISIONS				CASUALTIES			
	FTL	SER	SLT	TOTAL	FTL	SER	SLT	TOTAL
01-01-19 – 31-12-19	0	0	3	3	0	0	5	5
01-01-20 – 31-12-20	0	0	0	0	0	0	0	0
01-01-21 – 31-12-21	0	0	0	0	0	0	0	0
01-01-22 – 31-12-22	0	1	0	1	0	1	1	2
01-01-23 – 31-12-23	0	0	1	1	0	0	2	2
TOTAL	0	1	4	5	0	1	8	9

Table 1 – Summary of collisions for the five-year period 2019-2023

The PICs were analysed and can be briefly summarised as follows:

- the average number of collisions was 1 per year
- the average number of casualties was 1.8 per year
- Three collisions occurred in daylight (60%)
- Two collisions occurred in darkness (40%)

3. DARKNESS PIC SAVING

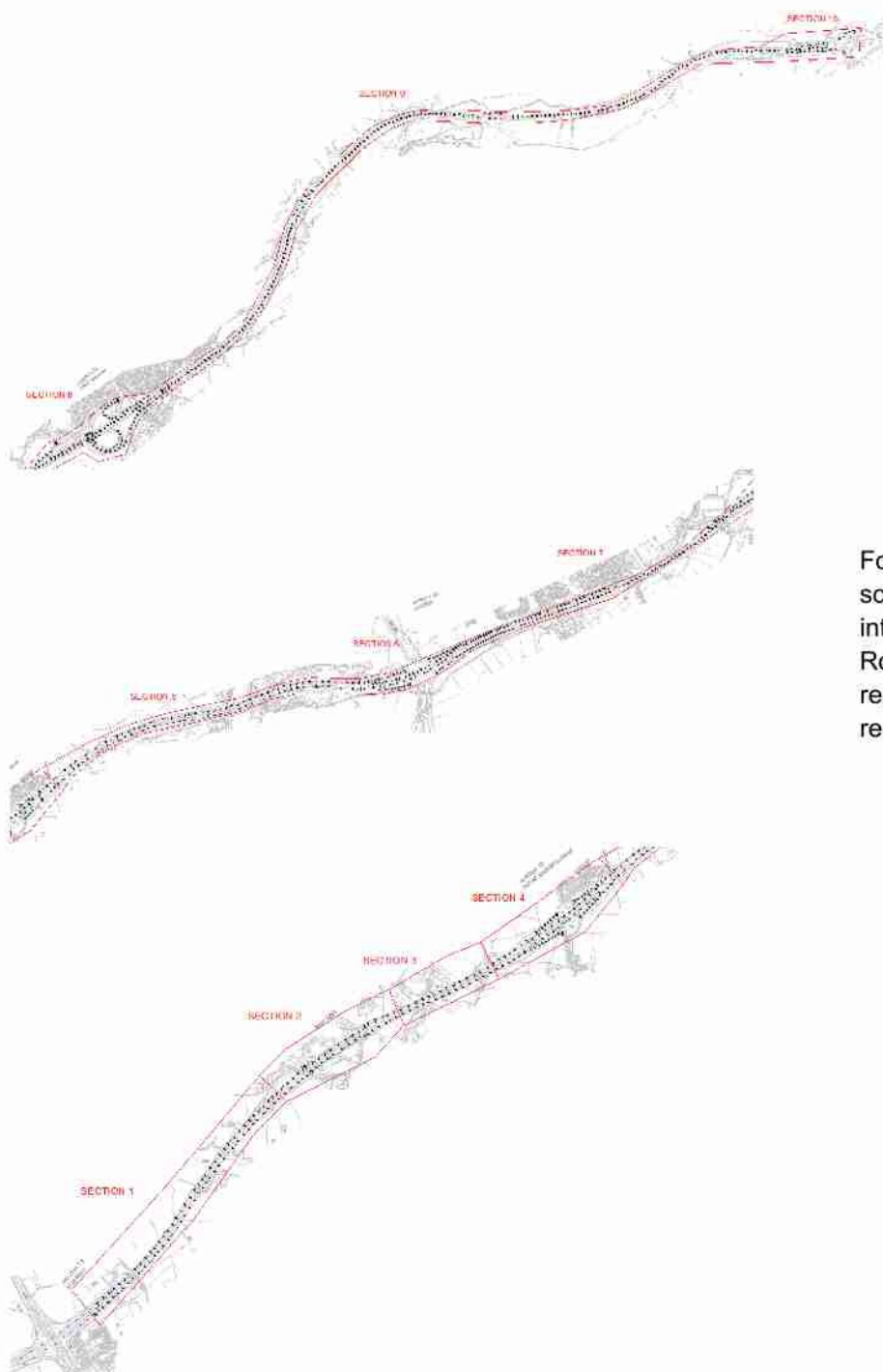
The STATS 19 dataset from the DfT website does not contain detailed text description of collision circumstances, so it was not possible to identify and exclude those where driver gross negligence (DGN) was a significant contributory factor. Therefore, the average number of darkness PICs during the five-year study period was 0.4 per year.

The likely reduction in PICs in darkness on a motorway with lighting has been taken as 10% (IAN 167/12 'Guidance for the Removal of Road Lighting' Highways Agency 2012).

Based on the darkness PIC saving calculation method for renewing lighting on a lit link / junction, as given in TA 501, the predicted PIC saving is:

$0.4 \times (10 / (100 - 10)) = 0.04$ PICs saved per year by renewing lighting.

M62 J18-22 SECTION 9 TA 501 ASSESSMENT – ROAD SAFETY ENGINEER REPORT



For collision analysis, the scheme has been split into seven sections. This Road Safety Engineer report covers collisions reported in **Section 9**.

1. COLLISION DATA SOURCE

Personal injury collision (PIC) data was provided by National Highways but when compared with validated STATS19 PIC data from the Department for Transport (DfT) website it was found to be incomplete. To allow accurate analysis of the full five-year period 2019-2023 the decision was made to use the DfT validated STATS19 data.

2. PERSONAL INJURY COLLISION DATA ANALYSIS

Twenty-eight PICs were reported on the M62 within the extents of Section 9. These PICs are summarised by year and severity in Table 1 below:

PERIOD	COLLISIONS				CASUALTIES			
	FTL	SER	SLT	TOTAL	FTL	SER	SLT	TOTAL
01-01-19 – 31-12-19	0	3	7	10	0	3	17	20
01-01-20 – 31-12-20	0	1	0	1	0	1	0	1
01-01-21 – 31-12-21	0	2	4	6	0	2	7	9
01-01-22 – 31-12-22	0	2	2	4	0	2	3	5
01-01-23 – 31-12-23	1	1	5	7	1	2	9	12
TOTAL	1	9	18	28	1	10	36	47

Table 1 – Summary of collisions for the five-year period 2019-2023

The PICs were analysed and can be briefly summarised as follows:

- the average number of collisions was 5.6 per year
- the average number of casualties was 9.4 per year
- nineteen collisions occurred in daylight (68%)
- nine collisions occurred in darkness (32%)

3. DARKNESS PIC SAVING

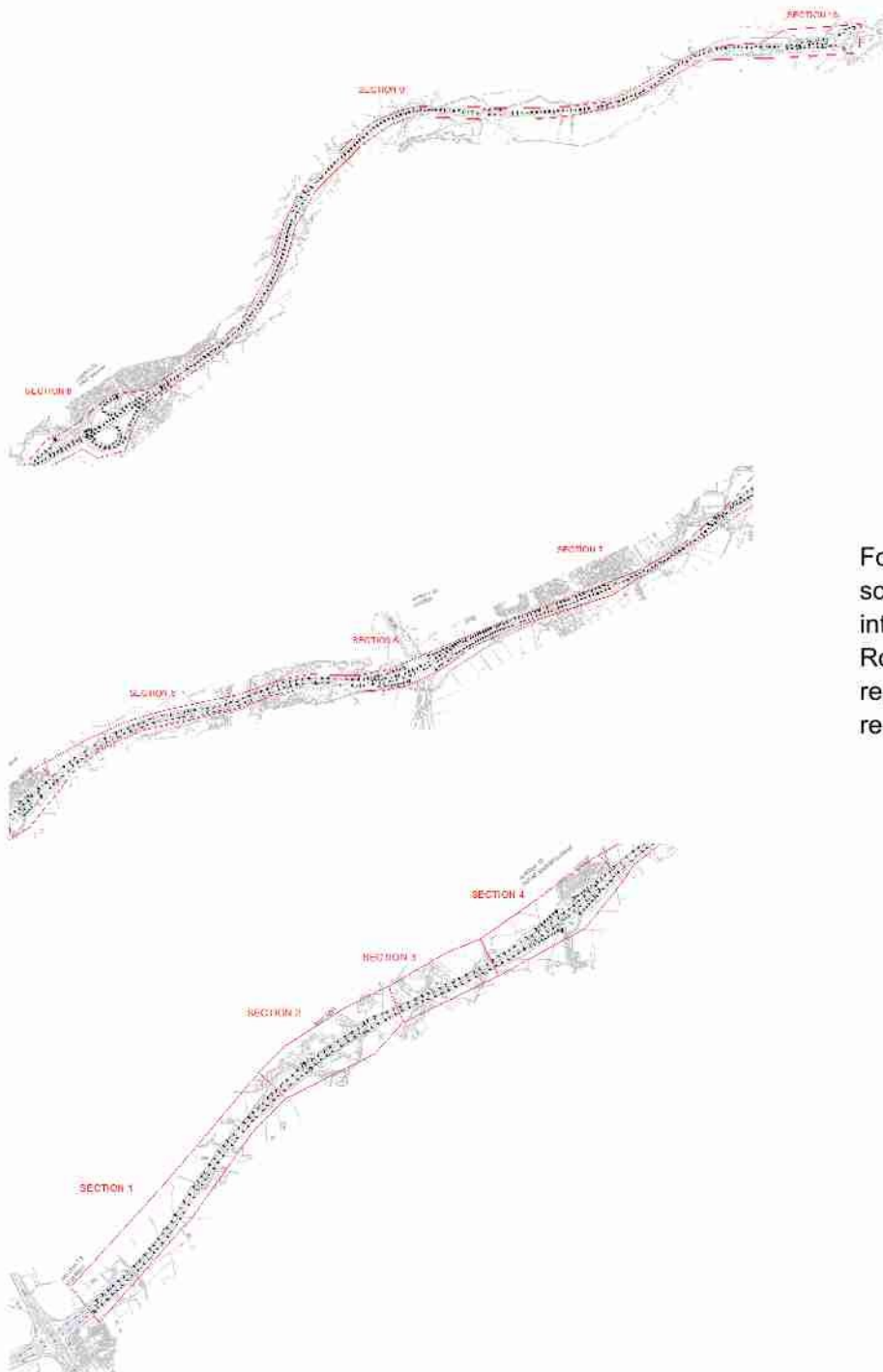
The STATS 19 dataset from the DfT website does not contain detailed text description of collision circumstances, so it was not possible to identify and exclude those where driver gross negligence (DGN) was a significant contributory factor. Therefore, the average number of darkness PICs during the five-year study period was 1.8 per year.

The likely reduction in PICs in darkness on a motorway with lighting has been taken as 10% (IAN 167/12 'Guidance for the Removal of Road Lighting' Highways Agency 2012).

Based on the darkness PIC saving calculation method for renewing lighting on a lit link / junction, as given in TA 501, the predicted PIC saving is:

$1.8 \times (10 / (100 - 10)) = 0.2$ PICs saved per year by renewing lighting.

M62 J18-22 SECTION 10 TA 501 ASSESSMENT – ROAD SAFETY ENGINEER REPORT



For collision analysis, the scheme has been split into seven sections. This Road Safety Engineer report covers collisions reported in **Section 10**.

1. COLLISION DATA SOURCE

Personal injury collision (PIC) data was provided by National Highways but when compared with validated STATS19 PIC data from the Department for Transport (DfT) website it was found to be incomplete. To allow accurate analysis of the full five-year period 2019-2023 the decision was made to use the DfT validated STATS19 data.

2. PERSONAL INJURY COLLISION DATA ANALYSIS

Seven PICs were reported on the M62 within the extents of Section 10. These PICs are summarised by year and severity in Table 1 below:

PERIOD	COLLISIONS				CASUALTIES			
	FTL	SER	SLT	TOTAL	FTL	SER	SLT	TOTAL
01-01-19 – 31-12-19	0	0	2	2	0	0	4	4
01-01-20 – 31-12-20	0	0	0	0	0	0	0	0
01-01-21 – 31-12-21	0	2	0	2	0	2	0	2
01-01-22 – 31-12-22	0	0	1	1	0	0	3	3
01-01-23 – 31-12-23	0	0	2	2	0	0	9	9
TOTAL	0	2	5	7	0	2	16	18

Table 1 – Summary of collisions for the five-year period 2019-2023

The PICs were analysed and can be briefly summarised as follows:

- the average number of collisions was 1.4 per year
- the average number of casualties was 3.6 per year
- six collisions occurred in daylight (86%)
- one collision occurred in darkness (14%)

3. DARKNESS PIC SAVING

The STATS 19 dataset from the DfT website does not contain detailed text description of collision circumstances, so it was not possible to identify and exclude those where driver gross negligence (DGN) was a significant contributory factor. Therefore, the average number of darkness PICs during the five-year study period was 0.2 per year.

The likely reduction in PICs in darkness on a motorway with lighting has been taken as 10% (IAN 167/12 'Guidance for the Removal of Road Lighting' Highways Agency 2012).

Based on the darkness PIC saving calculation method for renewing lighting on a lit link / junction, as given in TA 501, the predicted PIC saving is:

$0.2 \times (10 / (100 - 10)) = 0.02$ PICs saved per year by renewing lighting.

Appendix E - SAR

Documents included in Appendix E are listed below:

Item	Title
Option 1 SAR	13M62J18-22 SAR Option 1
Option 2 Section 1 SAR	13M62J18-22 SAR Option 2 S1
Option 2 Section 2 SAR	13M62J18-22 SAR Option 2 S2
Option 2 Section 3 SAR	13M62J18-22 SAR Option 2 S3
Option 2 Section 4 SAR	13M62J18-22 SAR Option 2 S4
Option 2 Section 5 SAR	13M62J18-22 SAR Option 2 S5
Option 2 Section 6 SAR	13M62J18-22 SAR Option 2 S6
Option 2 Section 7 SAR	13M62J18-22 SAR Option 2 S7
Option 2 Section 8 SAR	13M62J18-22 SAR Option 2 S8
Option 2 Section 9 SAR	13M62J18-22 SAR Option 2 S9
Option 2 Section 10 SAR	13M62J18-22 SAR Option 2 S10

Estimated scheme costs set as 2020. Estimated scheme opening set 2023.

Guidance from National Highways - Safety, Engineering & Standards on using SAR

From: National Highways - Safety, Engineering & Standards

[<automation@highwaysengland.atlassian.net>](mailto:automation@highwaysengland.atlassian.net)

Sent: Wednesday, January 15, 2025 1:06 PM

To: [REDACTED] [<\[REDACTED\]@kier.co.uk>](mailto:[REDACTED]@kier.co.uk)

Subject: [SRP-3526] Response to your feedback

Thank you for taking time to provide feedback on our standards. Your feedback has been reviewed, and the following response has been provided by a National Highways Safety, Engineering & Standards representative:

[REDACTED]

Thank you for contacting National Highways about the Design Manual for Roads and Bridges (DMRB) TA501 Road lighting appraisal document revision 0 issued March 2020.

The GOV.UK guidance for small scheme appraisal toolkit user guide was withdrawn on 14 June 2022 and the Highways England Scheme appraisal report (SAR) 2020 (the latest version) is no longer available for download from the [tamesoftware.co.uk](https://www.tamesoftware.co.uk) website.

Reference to the SAR will be removed in the latest version of the TA501 that is programmed for publication in September 2025.

In the interim period continue with the 2020 version of the SAR.

Regards

SES Road Lighting

Please note this is an automated email. Please submit any further related queries via our [Feedback management form](#) using the option 'Follow up on previous feedback' and your feedback reference only e.g. SRP-1234 with no spaces or additional text. Your feedback reference is SRP-3526.

If you need further assistance with this, please email standards_enquiries@nationalhighways.co.uk.

Summary of original feedback:

Feedback ref: **SRP-3526**

Feedback type: **General query about the suite of documents, website query, or publication related query**

Suite: **General (All other queries)**

Suite (Other) (if applicable):

Associated document: **Generic**

Clause feedback related to (if applicable):

Nature of challenge (if applicable):

Details of request/challenge: **TA 501 Road lighting appraisal states on page 15 in section 7. Scheme appraisal report (SAR) that, \"the Overseeing Organisation's SAR shall be used to determine the monetary benefit of the proposed lighting scheme through the calculation of the benefit cost ration (BCR).\" Can you please let me know where I can find a copy of the latest SAR? The one I have is dated 2020.**

Other associated documents (if applicable):

How should the standard be amended/updated (if applicable):

Key benefits (if applicable):

Assumptions, risks, issues or dependencies (if applicable):

Is feedback anonymous?: **No**

Originator name (if not anonymous): **[REDACTED]**

Originator company (if not anonymous): **Kier Transportation**

Originator role (if not anonymous): **Divisional Lead - Lighting, Technology and Traffic Signals**

Originator email (if not anonymous): **[REDACTED]** [@kier.co.uk](mailto:[REDACTED]@kier.co.uk)

Scope of feedback (if not anonymous): **I am feeding back on behalf of my organisation**

Is the feedback suitable for a case study?: **No**

Reason for case study (if applicable):

Should the feedback be treated as confidential: **No**

Reason for confidential (if applicable):