Sarnlea Consulting Engineers
128 City Road
London
EC1V 2NX

Tel: +44 7896 984328
alistair.mcmurray@sarnlea.co.uk

Sarnlea
Consulting Engineers

26 September 2025

Emissions Mitigation Assessment and Statement

Land South of Hammerwood Road, Ashurst Wood, West Sussex, RH19 3RX

Enclosure

Proposed Site Layout

TRICS Outputs (version 8.25.6)

EFT Outputs and Calculations

Executive Summary

This Emissions Mitigation Assessment (EMA) has been prepared to accompany a planning application for the development of twelve dwellings at Land South of Hammerwood Road, Ashurst Wood, West Sussex.

The purpose of the assessment is to calculate the transport-related emissions associated with the scheme and to set out an appropriate mitigation package in accordance with the Sussex Air Quality and Emissions Mitigation Guidance (2021).

The assessment demonstrates that the development will generate approximately 19,960 vehicle trips per year, equating to 199,600 vehicle kilometres.

Annual emissions calculated using DEFRA's Emissions Factor Toolkit (v11.0.1) equate to 44.5 kg of NOx and 4.0 kg of PM2.5 per year. When monetised using DEFRA's published damage cost values, the total five-year impact is calculated at approximately £3,841.

Preamble

This Emissions Mitigation Assessment (EMA) has been prepared on behalf of the applicant in support of a planning application for the development of twelve residential dwellings at Land South of Hammerwood Road, Ashurst Wood, West Sussex.

The purpose of the EMA is to calculate the traffic-related emissions associated with the scheme and to set out an appropriate package of mitigation measures in accordance with the Sussex Air Quality and Emissions Mitigation Guidance (2021).

EMAs are a relatively recent requirement in the planning process and reflect the increasing emphasis placed on local air quality and public health by both national and local policy.

Unlike a full Air Quality Impact Assessment, which may be required for larger or more sensitive proposals, an EMA focuses specifically on quantifying the additional road traffic emissions associated with new development.

These emissions are then monetised using DEFRA's nationally recognised damage cost values, and the resulting figure is used to determine the scale of mitigation required.

The applicant is expected to deliver a package of measures at least equivalent in value to the monetised emissions cost, ensuring the impacts of development are effectively neutralised.

Development Proposal and Context

The application site is located on land to the south of Hammerwood Road, within the settlement of Ashurst Wood in West Sussex. The site comprises a parcel of land that is currently open and undeveloped, characterised by a mix of grassed areas and boundary vegetation.

It lies on the southern edge of the built-up area of the village, immediately adjacent to existing residential properties to the north and west, with more open countryside to the south. The site benefits from direct frontage onto Hammerwood Road, which provides the principal point of access and links westwards towards East Grinstead.

In terms of its setting, the site sits within a transitional location at the interface between the defined settlement and the surrounding rural landscape.

Development to the north is predominantly residential in character, typically detached and semi-detached dwellings fronting Hammerwood Road. To the east and south, the land becomes more rural in character, with fields and hedgerows forming part of the wider countryside setting. The immediate context is therefore semi-rural, but one which has already experienced incremental residential development.

From a planning history perspective, the site has been identified previously through local engagement as a potential location for small-scale housing growth, reflecting its accessible edge-of-settlement location. The planning history does

not indicate the presence of significant constraints in terms of access or deliverability. Previous development in Ashurst Wood has followed a similar pattern of modest infill and edge-of-village schemes, generally supported where they respect the scale and form of the settlement.

The current proposals seek full planning permission for the erection of twelve new dwellings. The scheme has been designed to respond positively to its context, providing a balanced mix of dwelling types that reflect local needs. The indicative layout demonstrates that the dwellings can be arranged around a shared access point from Hammerwood Road, with internal circulation and turning areas sufficient to accommodate residents and servicing vehicles.

The dwellings will be of two-storey form, with pitched roofs and traditional design elements that complement the surrounding built form. Landscaping is proposed to reinforce the southern boundary and integrate the development into its rural edge setting.

The proposal includes on-plot parking provision in accordance with local standards, together with secure cycle storage for each dwelling and electric vehicle charging points. These measures ensure the development is capable of meeting the day-to-day needs of future residents while aligning with the Council's wider sustainable transport objectives.

Overall, the development represents a logical and proportionate extension to the settlement of Ashurst Wood, utilising an accessible edge-of-village site to deliver much-needed new housing in a sustainable manner. The scheme has been informed by the site's context, the prevailing character of the area, and national and local planning policy requirements.

Policy Context

National planning policy is clear in its expectation that new development should contribute to a low-carbon, sustainable future. Paragraphs 8, 105 and 186 of the National Planning Policy Framework (NPPF) emphasise that the planning system should promote sustainable transport and improve air quality.

The Planning Practice Guidance (PPG) reinforces this, setting out that mitigation of air quality impacts may include infrastructure to encourage low-emission vehicles, sustainable transport modes, and behaviour change.

At the local level, the requirement for EMAs in Sussex arises directly from the Sussex Air Quality and Emissions Mitigation Guidance (2021), jointly adopted by local authorities across the county.

The guidance establishes a consistent framework for assessing and mitigating emissions impacts from development. It applies to both strategic and smaller-scale schemes, ensuring that cumulative growth does not undermine local and regional air quality objectives.

Within Mid Sussex, relevant policies of the Local Plan (2014–2031) and associated Supplementary Planning Documents (SPDs) set out a clear requirement for developments to consider air quality impacts and deliver mitigation where necessary. Policies DP26 (Climate Change), DP29 (Noise, Air and Light Pollution) and DP21 (Transport) are all engaged in this respect.

Methodology

The following methodology has been applied in line with Sussex guidance:

Trip Generation

Vehicle trip generation has been derived from the TRICS database (version 8.25.6). The analysis was undertaken using the land use category “Houses, Privately Owned”, filtered to sites located in edge-of-town and village settings within the South East, South West and East of England.

A total of seven survey sites were considered appropriate comparators, representing settlements with similar accessibility and car ownership characteristics to Ashurst Wood.

The interrogation produced an average daily vehicle trip rate of 4.561 per dwelling. When applied to the twelve dwellings proposed, this equates to 54.7 trips per day. Annualised, this results in 19,960 vehicle trips.

Vehicle Kilometres

The Sussex methodology prescribes a standard trip length of 10 km, reflecting National Travel Survey data for average car journeys.

This approach provides consistency across assessments and avoids unnecessary dispute over localised trip length assumptions. Applying this distance to the annual trip forecast results in 199,600 vehicle kilometres generated per year by the proposed development.

Emissions Factors

Emissions factors were derived directly from DEFRA’s Emissions Factor Toolkit (EFT v11.0.1). The calculation was undertaken for 2025, Urban (not London) Minor Road, England (fleet average), with outputs extracted for NOx and PM2.5.

These were multiplied by the forecast vehicle-kilometres to produce annual totals.

Damage Costs

DEFRA publishes damage cost values which monetise the health and environmental harm associated with each tonne of pollutant emitted.

For 2025, the central estimates are £11,331 per tonne of NOx and £65,448 per tonne of PM2.5.

These values have been applied to the calculated emissions to produce a monetised damage cost. In line with the Sussex guidance, the annual cost has then been multiplied by a five-year period to reflect the operational phase of the development.

Results

The calculation outputs are presented in Tables 1 and 2 below.

Table 1: Annual Emissions from Development Traffic

Pollutant	Annual Emissions (kg/year)	Annual Emissions (tonnes)
NOx	44.531	0.0445
PM2.5	4.022	0.0040

Table 2: Damage Cost Calculation

Pollutant	Tonnes/year	£/tonne (DEFRA 2023)	Annual Cost (£)	Five-Year Cost (£)
NOx	0.0445	£11,331	£505	£2,525
PM2.5	0.0040	£65,448	£263	£1,316
Total			£768	£3,841

The total monetised emissions cost associated with the development is therefore £3,841 (rounded). This confirms that the assessment has been undertaken directly using DEFRA's EFT v11.0.1 rather than estimated factors.

Mitigation

The applicant has identified a package of mitigation measures that will be delivered as part of the development. Each dwelling will be provided with an active electric vehicle charging point, representing a total investment of £14,400 (12 units × £1,200). Secure storage for two bicycles will also be provided per dwelling, delivering twenty-four cycle spaces in total at an estimated cost of £6,000.

In addition to this physical infrastructure, the applicant will commit to providing resident travel information packs to encourage sustainable travel choices. This initiative is costed at £1,000.

The total value of the mitigation package is therefore approximately £21,400.

This is more than four times the calculated emissions cost, ensuring the impact of the development is fully offset.

Should the Local Planning Authority consider additional measures appropriate, such as contributions towards wider sustainable transport infrastructure or car club membership initiatives, the applicant would be willing to discuss these in principle.

Conclusion

The five-year impact is calculated at £3,841.

The applicant has committed to mitigation measures valued at £21,400, including universal EV charging, secure cycle storage, and resident travel packs. The value of the mitigation package comfortably exceeds the monetised emissions impact.

On this basis, it is concluded that the development is compliant with national and local policy requirements relating to air quality and transport emissions.

The proposed mitigation is proportionate, deliverable, and appropriate to the scale of the development, and ensures that the residual impact of the scheme is effectively neutralised.

-----END----

Alistair McMurray MSc BSc CEng MCIHT MCILT

Director – Traffic Engineering and Transport Planning

Hammerwood Road

Yewhurst Close

1 3br
2 3br
3 3br
4 3br
5 2br
6 2br
7 2br
8 2 br
9 4br
10 4br
11 4br
12 4br

cyc

0 5 10 15 20 25 m

Scale 1:200 at A1

N

Note: Levels are indicative and approximate. Final levels may vary according to construction and local conditions.

MEASURES SCARFE

ARCHITECTS

Project
Land at Hammerwood Road RH19 3RX (2025)

Client
Turnbull Land Ltd

Title
Site layout

Scale
1:200@A1

Date
September 2025

Drawing Number
923:1181/PL100

68 Kings Road
Teddington
Middlesex TW11 0QE
Tel 020 8943 4767
Email: richard@measuresscarfe.co.uk
Mobile 07989 485 105

Filtering Summary:

Land Use: 03/A RESIDENTIAL/HOUSES PRIVATELY OWNED

Selected Trip Rate Calculation Parameter Range: 1 - 50 DWELLS

Actual Trip Rate Calculation Parameter Range: N/A DWELLS

Date Range: Minimum: 01/01/2013 Maximum: 17/09/2024

Parking Spaces Range: All Surveys Selected

Parking Spaces Per Dwelling Range: All Surveys Selected

Bedrooms Per Dwelling Range: All Surveys Selected

Percentage of Dwellings Privately Owned: All Surveys Selected

Population Within 500m Range: 750 2742

Days of the week selected:

Friday	2
Monday	1
Thursday	2
Wednesday	2

Main Location Types selected:

Edge of Town	6
Suburban Area (PPS6 Out of Centre)	1

Inclusion of Servicing Vehicles Counts:

Servicing Vehicle Excluded	6
Servicing Vehicles Included	1

Population <1 Mile ranges selected:

1,001 to 5,000	2
5,001 to 10,000	5

Population <5 Mile ranges selected:

25,001 to 50,000	4
5,001 to 25,000	2
50,001 to 75,000	1

Car Ownership <5 Mile ranges selected:

0.6 to 1.0	1
1.1 to 1.5	5
1.6 to 2.0	1

PTAL Rating:

No PTAL Present	7

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use: 03 - RESIDENTIAL

Category: A - HOUSES PRIVATELY OWNED

Selected Vehicle Type: Total Vehicles

Selected regions and areas:

02	**SOUTH EAST**		
	ES	EAST SUSSEX	1 day
	HC	HAMPSHIRE	2 days
03	**SOUTH WEST**		
	DC	DORSET	2 days
04	**EAST ANGLIA**		
	NF	NORFOLK	2 days

This section displays the number of survey days per TRICS® sub-region in the selected set.

Primary Filtering Selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter:	DWELLS
Actual Range:	0.7 to 2.17 (units:DWELLS)
Range Selected by User:	1 to 50 (units:DWELLS)
Parking Spaces Range:	6 - 2696

Public Transport Provision:

Selection by:	All Surveys Included
Date Range:	01/01/13 to 17/09/24

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Friday	2 days
Monday	1 days
Thursday	2 days
Wednesday	2 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	7
Direction ATC Count	0

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaking using machines

Selected Locations:

Edge of Town	6 days
Suburban Area (PPS6 Out of Centre)	1 days

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

No Sub Category	1 days
Residential Zone	6 days

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Inclusion of Servicing Vehicle Counts:

Servicing vehicles Excluded	6 days
Servicing vehicles Included	1 days

Secondary Filtering Selection:

Use Class:

C3	7 surveys

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order (England) 2020 has been used for this purpose, which can be found within the Library module of TRICS®.

Population within 500m Range:

350 - 3091

Population within 1 mile:

1,001 to 5,000	2 surveys
5,001 to 10,000	5 surveys

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

25,001 to 50,000	4 surveys
5,001 to 25,000	2 surveys
50,001 to 75,000	1 surveys

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.6 to 1.0	1 surveys
1.1 to 1.5	5 surveys
1.6 to 2.0	1 surveys

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Petrol filling station:

This data displays the number of surveys within the selected set that include petrol filling station activity, and the number of surveys that do not.

Travel Plan:

No	2 surveys
Yes	5 surveys

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

PTAL Rating:

No PTAL Present	7 surveys

This data displays the number of surveys within the selected set that include petrol filling station activity, and the number of surveys that do not.

COVID-19 Restrictions:

No

1	**DC-03-A-09**	**MIXED HOUSES**	**DORSET**

A350
SHAFTESBURY
Edge of Town
No Sub Category
Site area: 1.65 hect
Survey date: Friday 19/11/2021 Survey Type: Manual

2	**DC-03-A-10**	**MIXED HOUSES**	**DORSET**

ADDISON CLOSE
GILLINGHAM
Edge of Town
Residential Zone
Site area: 1.4 hect
Survey date: Wednesday 09/11/2022 Survey Type: Manual

3	**ES-03-A-13**	**DETACHED HOUSES**	**EAST SUSSEX**

A265
HEATHFIELD
Edge of Town
Residential Zone
Site area: 1.7 hect
Survey date: Monday 18/03/2024 Survey Type: Manual

4	**HC-03-A-17**	**HOUSES & FLATS**	**HAMPSHIRE**

CANADA WAY
LIPHOOK
Suburban Area (PPS6 Out of Centre)
Residential Zone
Site area: 0.8 hect
Survey date: Thursday 12/11/2015 Survey Type: Manual

5	**HC-03-A-31**	**MIXED HOUSES & FLATS**	**HAMPSHIRE**

KILN ROAD
LIPHOOK
Edge of Town
Residential Zone
Site area: 2.17 hect
Survey date: Friday 07/10/2022 Survey Type: Manual

6	**NF-03-A-05**	**MIXED HOUSES**	**NORFOLK**

HEATH DRIVE
HOLT
Edge of Town
Residential Zone
Site area: 1.57 hect
Survey date: Thursday 19/09/2019 Survey Type: Manual

7	**NF-03-A-10**	**MIXED HOUSES & FLATS**	**NORFOLK**

HUNSTANTON ROAD
HUNSTANTON
Edge of Town
Residential Zone
Site area: 0.7 hect
Survey date: Wednesday 12/09/2018 Survey Type: Manual

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED

Total Vehicles

Calculation factor: 1 DWELLS

Estimated TRIP rate value per 11 DWELLS shown in shaded columns

**BOLD print indicates peak (busiest) period*

Time Range	No. Days	Ave. DWELLS	Arrivals	Estimated Trip Rate	Departures	Estimated Trip Rate	Totals	Estimated Trip Rate
00:00-01:00								
01:00-02:00								
02:00-03:00								
03:00-04:00								
04:00-05:00								
05:00-06:00								
06:00-07:00								
07:00-08:00	7	36	0.084	0.928	0.253	2.783	0.337	3.711
08:00-09:00	7	36	0.157	1.723	0.301	3.313	0.458	5.036
09:00-10:00	7	36	0.177	1.944	0.189	2.076	0.366	4.020
10:00-11:00	7	36	0.133	1.458	0.112	1.237	0.245	2.695
11:00-12:00	7	36	0.165	1.811	0.185	2.032	0.350	3.843
12:00-13:00	7	36	0.197	2.165	0.209	2.297	0.406	4.462
13:00-14:00	7	36	0.177	1.944	0.173	1.900	0.350	3.844
14:00-15:00	7	36	0.149	1.635	0.173	1.900	0.322	3.535
15:00-16:00	7	36	0.265	2.916	0.169	1.855	0.434	4.771
16:00-17:00	7	36	0.261	2.871	0.201	2.209	0.462	5.080
17:00-18:00	7	36	0.337	3.711	0.169	1.855	0.506	5.566
18:00-19:00	7	36	0.209	2.297	0.116	1.281	0.325	3.578
19:00-20:00								
20:00-21:00								
21:00-22:00								
22:00-23:00								
23:00-00:00								
Total Rates:			2.311	25.402	2.250	24.739	4.561	50.141

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

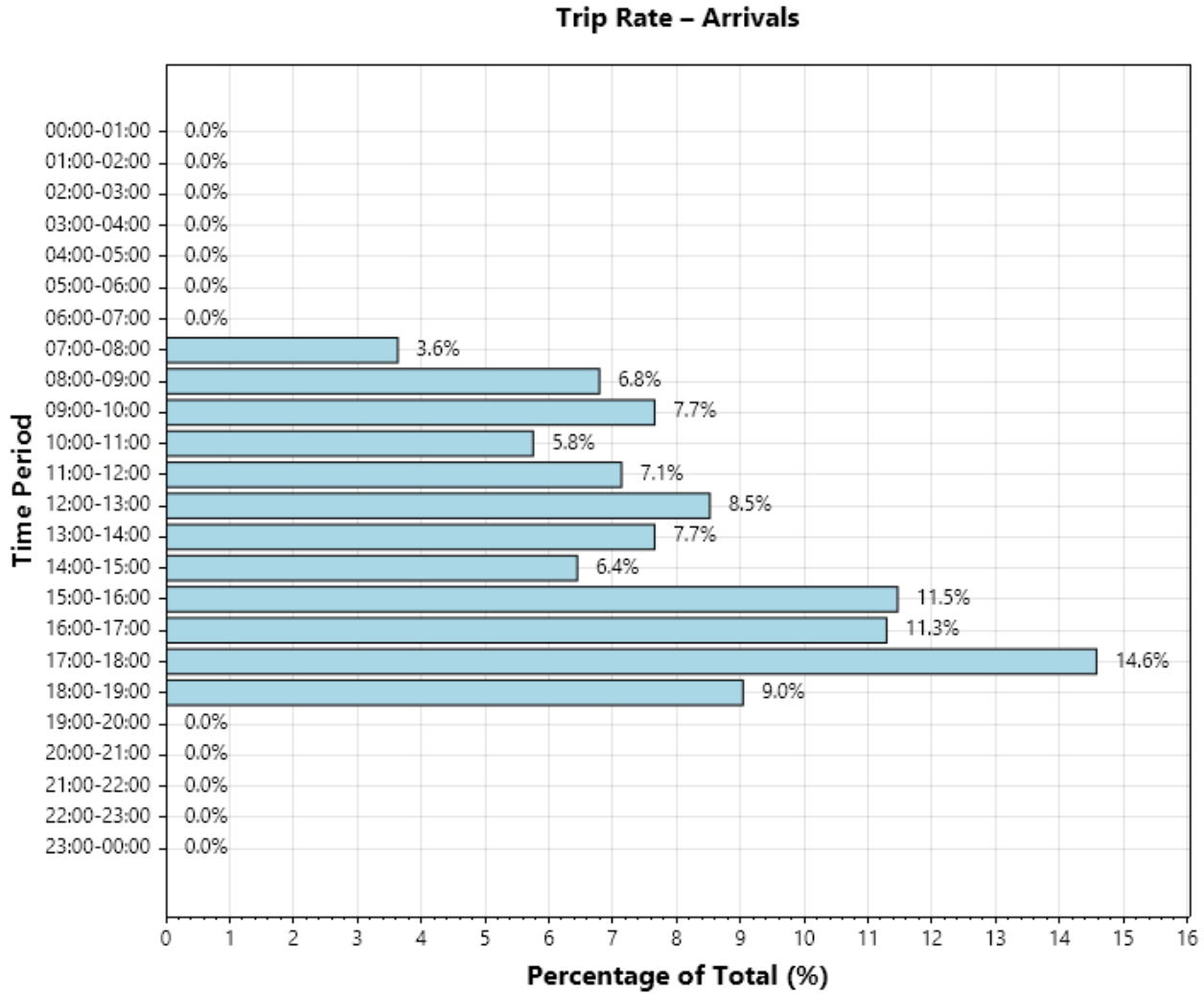
*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

Parameter Summary:

Trip rate parameter range selected:	1 - 50 (units: DWELLS)
Survey date date range:	12/11/2015 - 18/03/2024
Number of weekdays (Monday-Friday):	7
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	15
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

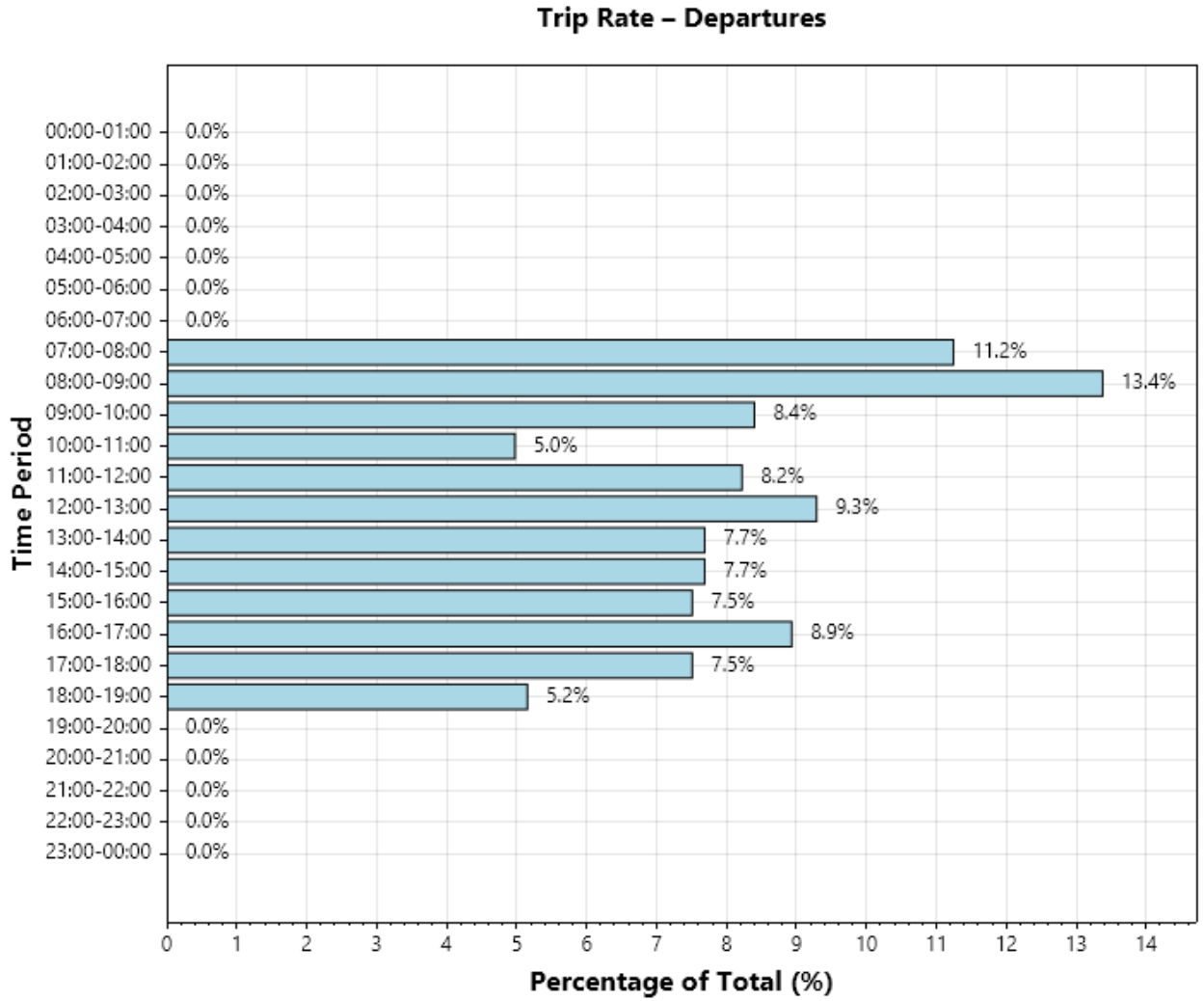
Trip Rate Total Vehicles – Arrivals



This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.

Generated on: 2025-10-01 15:47

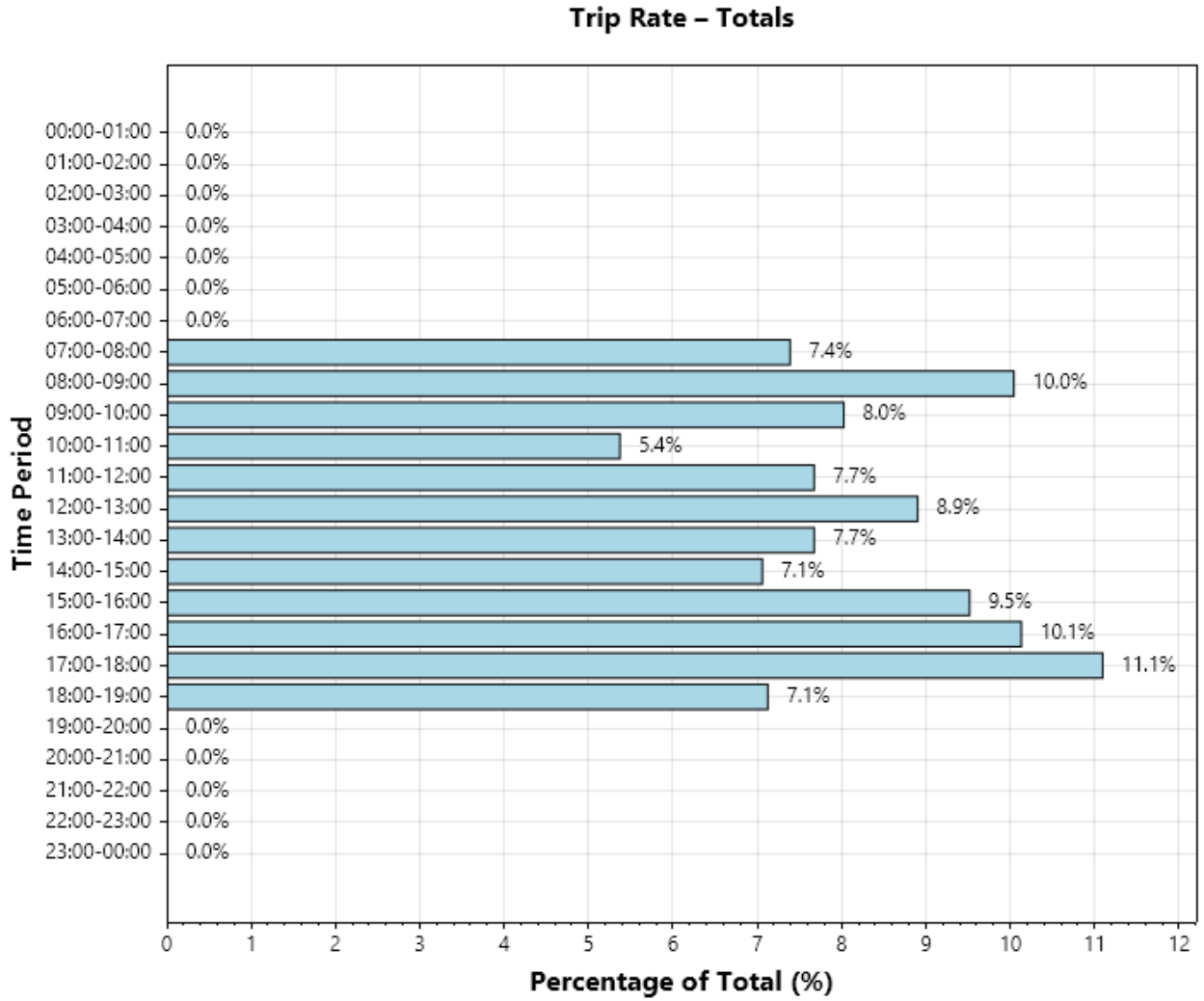
Trip Rate Total Vehicles – Departures



This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.

Generated on: 2025-10-01 15:47

Trip Rate Total Vehicles – Totals



This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.

Generated on: 2025-10-01 15:47

Emissions Factor Toolkit (EFT) Outputs and Calculations

Table A1: EFT v11.0.1 Inputs (Primary Settings)

Parameter	Input Value	Notes
Area	England (not London)	Per Sussex AQ Guidance
Year	2025	Assessment year
Road Type	Urban (not London) Minor Road	Appropriate for residential setting
Flow	55 vehicles/day	From TRICS (12 dwellings)
Link Length	10 km	Default per Sussex methodology
Average Speed	30 km/h	Typical local road
Gradient	0%	Flat
Hours	24	Daily traffic
Pollutants Selected	NOx, PM2.5	Sussex EMA requirement
Output Type	Annual Link Emissions	Required for EMA

Table A2: EFT v11.0.1 Output Results

Source ID	Pollutant	Annual Emissions (kg/year)	Annual Emissions (tonnes/year)
1	NOx	44.531	0.0445
1	PM2.5	4.022	0.0040

Table A3: Monetised Emissions Costs (DEFRA Damage Costs 2023, Central Values)

Pollutant	Tonnes/year	£/tonne	Annual Cost (£)	5-Year Cost (£)
NOx	0.0445	£11,331	£505	£2,525
PM2.5	0.0040	£65,448	£263	£1,316
Total	-	-	£768	£3,841