Vale of Glamorgan
Adopted Local Development Plan
2011 - 2026

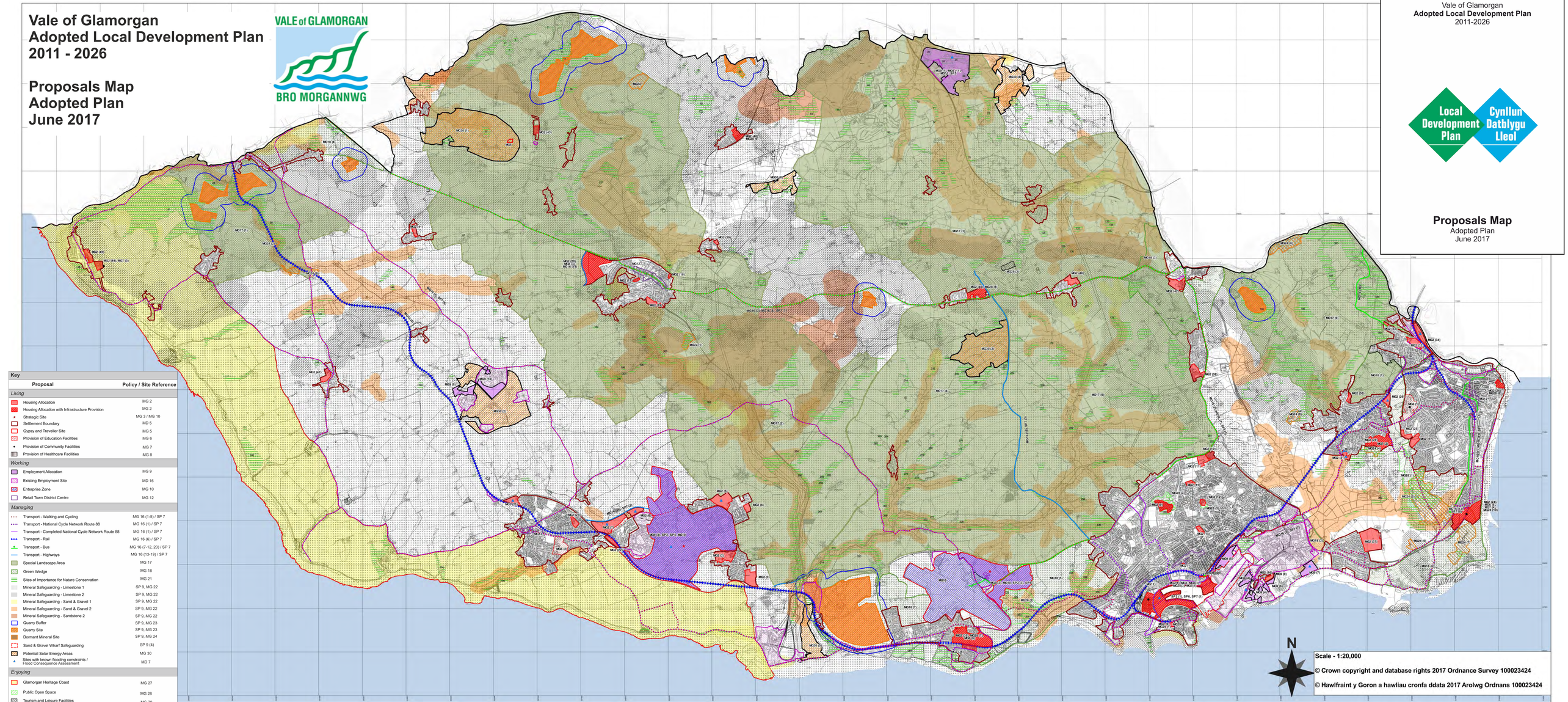
Proposals Map
Adopted Plan
June 2017

VALE of GLAMORGAN
BRO MORGANNWG

Vale of Glamorgan
Adopted Local Development Plan
2011-2026

Local Development Plan
Cynllun Datblygu Lleol

Proposals Map
Adopted Plan
June 2017



Key	
Proposal	**Policy / Site Reference**
Living	
Housing Allocation	MG 2
Housing Allocation with Infrastructure Provision	MG 2
Strategic Site	MG 3 / MG 10
Settlement Boundary	MD 5
Gypsy and Traveller Site	MG 5
Provision of Education Facilities	MG 6
Provision of Community Facilities	MG 7
Provision of Healthcare Facilities	MG 8
Working	
Employment Allocation	MG 9
Existing Employment Site	MD 16
Enterprise Zone	MG 10
Retail Town District Centre	MG 12
Managing	
Transport - Walking and Cycling	MG 16 (1-5) / SP 7
Transport - National Cycle Network Route 88	MG 16 (1) / SP 7
Transport - Completed National Cycle Network Route 88	MG 16 (1) / SP 7
Transport - Rail	MG 16 (6) / SP 7
Transport - Bus	MG 16 (7-12, 20) / SP 7
Transport - Highways	MG 16 (13-19) / SP 7
Special Landscape Area	MG 17
Green Wedge	MG 18
Sites of Importance for Nature Conservation	MG 21
Mineral Safeguarding - Limestone 1	SP 9, MG 22
Mineral Safeguarding - Limestone 2	SP 9, MG 22
Mineral Safeguarding - Sand & Gravel 1	SP 9, MG 22
Mineral Safeguarding - Sand & Gravel 2	SP 9, MG 22
Mineral Safeguarding - Sandstone 2	SP 9, MG 22
Quarry Buffer	SP 9, MG 23
Quarry Site	SP 9, MG 23
Dormant Mineral Site	SP 9, MG 24
Sand & Gravel Wharf Safeguarding	SP 9 (4)
Potential Solar Energy Areas	MG 30
Sites with known flooding constraints / Flood Consequence Assessment	MD 7
Enjoying	
Glamorgan Heritage Coast	MG 27
Public Open Space	MG 28
Tourism and Leisure Facilities	MG 29

N

Scale - 1:20,000

Appendix C – JNY9624-02 Scoping Note

TECHNICAL NOTE

Project Title:	Land at Model Farm, Rhoose
Report Reference:	JNY9624-02
Date:	November 2018

TRANSPORT ASSESSMENT SCOPING NOTE

1. Introduction

1.1 This Scoping Report sets out the preferred approach to the preparation of an appropriate Transportation Assessment (TA), Transport Implementation Strategy (ITS) and Travel Plan (TP) to be submitted with a planning submission for development at Model Farm, Rhoose. The planning submission would seek outline planning permission with all matters reserved except the points of access.

1.2 It is envisaged that the development will accommodate business and employment uses on approximately 40 hectares of land. The proposed land uses are envisaged to be a mix of B1, B2 and B8 plus ancillary development.

1.3 The site is located to the immediate east of Cardiff airport and is bounded by the A4226 to the north, Port Road to the west, agricultural fields and Porthkerry Country Park to the south and agricultural fields to the east. It is located approximately two kilometres north east of Rhoose and four kilometres west of Barry.

1.4 The site forms part of the wider Cardiff Airport - St. Athan Enterprise Zone, which is allocated within the Vale of Glamorgan Local Development Plan 2011 ï 2026 (adopted June 2017). The Zone is allocated in the Local Development Plan for 77.4ha of B1, B2 and B8 employment uses and an extension to the Porthkerry Park. The ultimate Council led vision for the wider allocation is to create an 'airport city' taking the form of a business destination for local and international businesses including quality office accommodation, specialist education, training facilities and leisure developments. The development would be entirely consistent with the Council led vision.

1.5 An initially assumed development profile includes approximately 158,982m^2 square metres Gross Floor Area (GFA) of employment floorspace, comprising 63,593 m^2 GFA of B1 land uses, 63,593m^2 of B2 land uses and 31,796m^2 of B8 land uses (i.e. B1/B2/B8 provided on an approximate 40:40:20 ratio).

1.6 It is important to note that it is assumed at this time that an extensive trip distribution and assignment exercise is not required. This is on the basis that an existing SATURN model is validated and in place (further to work carried out for the Five Mile Lane improvements scheme) and that it allows for the allocation.

1.7 A response is sought from the highway authority at the Vale of Glamorgan Council and also from Transport for Wales and the intention is to reach agreement on the scope of work, working collaboratively with these stakeholders as appropriate. An initial discussion with the case highway officer at VoG suggested that a formal pre-application meeting with the local planning authority would be the best approach as a first-step.

2. Broad Structure of Reports

2.1 The TA will contain information and address matters under the following broad structure of headings:

1. Existing Highway Context;
2. Planning Background;
3. Highway Safety;
4. Accessibility;
5. Relevant Transport Related Planning Policy and Guidance;
6. Proposed Development;
7. Trip Attraction and Distribution; and
8. Impact and Mitigation.

2.2 A site-wide Travel Plan will be prepared which will consider how to reduce single vehicle occupancy further to occupation of the development, with reference as appropriate to targets, monitoring and an action plan. A structure for site-wide governance will be considered as part of this so as to ensure the message transfers to various occupying companies in due course.

2.3 A Transport Implementation Strategy (TIS) will be prepared to formally set out the objectives and targets relating to managing travel demand and will set out the infrastructure and demand management measures and financial contributions necessary to achieve them. The TIS will set out a framework for monitoring the objectives and targets including the future model split. There will be a direct synergy between the Travel Plan and the Parking Strategy to deter single occupancy vehicle journeys to and from the site.

3. Five Mile Lane Improvements Scheme (Planning Ref: 2016/00305/RG3)

3.1 It is understood that the Five Mile Lane Improvement Scheme has been designed to improve the connections between the M4 corridor and Cardiff to St Athan and the Cardiff Airport Enterprise Zone. The scheme is to improve journey times and network resilience.

3.2 The Transport Assessment that supported the planning application utilised the strategic SATURN model. It is assumed at this stage that the traffic flows associated with the Cardiff Airport - St. Athan Enterprise Zone were included within this model. The provision of more information from VoG and TfW would be welcomed in order to help refine the TA approach, going forward.

3.3 The scheme will result in a new and upgraded single lane carriageway 7.3m wide with a 1m wide hardstrip over a 4,850 metre stretch of Five Mile Lane, from just north of the Amelia Methodist Trust Farm in the north to Waycock Cross roundabout in the south. Three new junctions will be constructed along the route including two T-junctions and one staggered junction. It will also include

improvements at the existing signalised Sycamore Cross junction and at the existing Waycock Cross roundabout and also at the Culverhouse Cross signalised roundabout, all in order to provide capacity increases. The proposed improvements at the existing Waycock Cross and Culverhouse Cross roundabouts will improve efficiency although we understand that there will still be residual levels of congestion and that this has been accepted by the highway authorities.

4. M4 (Junction 34) to A48 (Sycamore Cross) Road Link

4.1 To enhance connectivity to Cardiff Airport and the strategic employment sites in the region and to improve network resilience The Vale of Glamorgan Council and the Welsh Government are currently developing proposals for a new road linking the M4 (junction 34) and the A48 (Sycamore Cross).

4.2 Earlier this year consultation was undertaken on two route options (east and west of Pendoylan) and a Parkway railway station. The outcome of the consultation and the preferred route option / full business case is awaited.

5. Study Area

5.1 It is proposed the Study Area can generally be confined to the lengths of the A4226, Port Road and Porthkerry Road in proximity to the site. It is assumed that impacts on the wider network has been accounted for through the Five Mile Lane assessment which utilised the strategic SATURN model. We are seeking immediate views on this approach.

Traffic and Parking Context

5.2 Classified turning count and queue length surveys will be carried out at the following locations.

1. A4226 / Port Road ï three-arm roundabout; and
2. Port Road / Cardiff airport access / Holiday Inn Express access four-arm roundabout.

5.3 Vehicles will be classified to COBA specification and disaggregated to 15-minute intervals. Queue lengths will be recorded for each approach lane at five-minute intervals.

5.4 Automatic Traffic Counts (ATC) will be installed for a seven-day period at the following locations:

1. A4226 east of the A4226/ Port Road roundabout; and
2. Port Road north of the Port Road / Cardiff airport access / Holiday Inn Express access roundabout.

5.5 The ATCs will be set to record class and speed by direction.

5.6 Local parking restrictions on the highway network will be set out.

Highway Safety

5.7 An assessment of Personal Injury Data for the most recent three-year period for which data is available for the roads and junctions within the area of scope will be undertaken.

Accessibility

5.8 An assessment of existing facilities for all modes of travel will be provided with reference to plans as appropriate. It is not considered necessary to carry out full Non-Motorised User audits or equivalent, given the principle of development here is already established.

6. Development Proposals

6.1 A remodelled roundabout at the A4226 / Port Road junction is proposed as the primary access with a secondary access formed from an existing stub on the Holiday Inn Express access road as indicatively shown on RPS Drawing No. JNY9283-05 attached at **Appendix A**. The junction designs will be refined as part of the TA work and will be subject to Stage One Road Safety Audits (RSAs) and Designerôs Responses.

6.2 Car, HGV, disabled, motorcycle and cycle parking will be developed in discussion with the stakeholders.

7. Planning Policy Guidance

7.1 The development proposals will be considered against the following transport policies and guidance:

- Planning Policy Wales (Edition 9, 2016);
- Technical Advice Note (TAN) 18: Transport (2007);
- People, Places, Futures ï The Wales Spatial Plan (2008);
- The Wales Transport Strategy (2008);
- The National Transport Plan (2010);
- Vale of Glamorgan Local Transport Plan (LTP3) 2015 ï 2030;
- Vale of Glamorgan Local Development Plan 2011 ï 2026 (2017);
- Vale of Glamorgan Supplementary Planning Guidance - Parking Standards (2015); and
- Vale of Glamorgan Supplementary Planning Guidance ï Travel Plan (2018).

8. Assessment Years

8.1 It is anticipated at this stage that the planning application will be submitted in 2019 and that the assessment years will be in line with what is contained in the SATURN model i.e. 2032.

8.2 If necessary (i.e. if the SATURN model is not available), the assessment years are assumed to be as follows:

1. 2019 Base;
2. 2024 Forecast Base;
3. 2024 Forecast + Development;
4. 2029 Forecast Base; and

5. 2029 Forecast + Development.

8.3 The various scenarios will include committed developed identified and agreed through discussions with VoG and TfW and information about these is requested urgently. Subject to availability of the SATURN model, background traffic growth will be derived from the NTM AF 15 dataset adjusted using TEMPRO for Middle Super Output Areas (MSOA) ôThe Vale of Glamorgan 014ô(W02000250). Growth factors would be adjusted to take into consideration committed development traffic.

9. Trip Attraction and Distribution

9.1 It is anticipated at this stage that previous assumptions on trip attraction can be extracted from the SATURN model and replaced with the traffic forecast to be associated with the current profile of development. A new four stage model is assumed not to be required.

9.2 The network weekday peak hours in proximity of the site will be confirmed further to the traffic surveys being carried out. However, for the purposes of this scoping note, trip attraction for the traditional weekday AM (08:00-09:00) and PM (17:00-18:00) peak hours has been assumed.

9.3 The number of vehicle trips likely to be attracted by the proposed development of up to 63,593m^2 of B1 Use, 63,593m^2 of B2 Use and 31,796m^2 of B8 Use has been estimated using the TRICS Version 7.5.2 database. The TRICS output reports are attached at **Appendix B**.

9.4 The TRICS weekday trip rates and associated vehicle trips are set out in **Table 9.1** below.

Table 9.1: Forecast Vehicle Trip Rates and Trips (Assumed Profile)

Time	Arrivals		Departures		Two-way	
B1 Office (63,593m^2)						
	Trip Rate	Trips	Trip Rate	Trips	Trip Rate	Trips
AM Peak (08:00-09:00)	1.222	777	0.196	125	1.418	902
PM Peak (17:00-18:00)	0.146	93	0.931	592	1.077	685
12 Hour (07:00 ï 19:00)	4.096	2,605	4.128	2,625	8.224	5,230
B2 General Industrial (63,593m^2)						
	Trip Rate	Trips	Trip Rate	Trips	Trip Rate	Trips
AM Peak (08:00-09:00)	0.325	207	0.148	94	0.473	301
PM Peak (17:00-18:00)	0.065	41	0.343	218	0.408	259
12 Hour (07:00 ï 19:00)	2.045	1,300	2.051	1,304	4.096	2,605
B8 Storage & Distribution (31,796m^2)						
	Trip Rate	Trips	Trip Rate	Trips	Trip Rate	Trips
AM Peak (08:00-09:00)	0.099	31	0.061	19	0.160	51
PM Peak (17:00-18:00)	0.028	9	0.104	33	0.132	42
12 Hour (07:00 ï 19:00)	1.025	276	1.064	280	2.089	556
TOTAL						
	Trip Rate	Trips	Trip Rate	Trips	Trip Rate	Trips
AM Peak (08:00-09:00)	0.639	1,015	0.150	238	0.788	1,253
PM Peak (17:00-18:00)	0.090	143	0.530	843	0.620	986
12 Hour (07:00 ï 19:00)	2.661	4,182	2.684	4210	5.346	8,391

9.5 The ratio of cars to HGVs will be calculated from the TRICS data.

9.6 Person trips for the proposed development will be derived from the attracted vehicle trips and the application of the Census 2011 Journey to Work modal choice data as shown in **Table 9.2** (should the SATURN model not have multi-modal data for example). The data, attached as **Appendix C**, has been calculated using zone W35001991.

Table 9.2: Census 2011 Journey to Work Modal Split

Method of Travel to Work	Number	Percentage
Train	26	2%
Bus, minibus or coach	46	3%
Taxi	8	0%
Motorcycle, scooter or moped	21	1%
Driving a car or van	1,423	86%
Passenger in a car or van	87	5%
Bicycle	22	1%
On foot	29	2%
Total	**1,662**	**100.0%**

9.7 Trips associated with the proposed development will be distributed using SATURN or alternatively using origin and destination data for journeys to work held in the 2011 Census data for the MSOA õGlamorgan 014ö(W0200250).

10. Trip Impact

10.1 Given it is assumed that SATURN modelling has already accounted for impacts further afield associated with the full Enterprize Zone, peak hour operational assessments, both with and without the development in place are anticipated at this stage to be limited to the following junctions:

- A4226 / Port Road - three-arm roundabout; and
- Port Road / Cardiff airport access / Holiday Inn Express access four-arm roundabout.

10.2 Other local junctions may be subject to assessment, depending on the difference in trips between what is in the SATURN model now, and what the TA forecasts as set out in **Table 9.1** (as evolved).

10.3 Operational assessments will be undertaken using Department for Transport approved industry standard software Junctions 9 ARCADY and PICADY.

10.4 The junction assessments will be calibrated against the observed queue length surveys undertaken for the classified turning count surveys.

10.5 The maximum Ratio of Flow to Capacity (RFC) and maximum queue length will be set out for each arm of each junction for each of the assessment scenarios.

10.6 The impact of the development on the walking and cycling routes in the vicinity of the site and public transport will be considered within the TA and improvements will be identified.

10.7 A public transport strategy will be proposed to link the development with local conurbations and transport hubs. This will be aligned with the objectives of the Travel Plan.

11. Parking Strategy

11.1 The VoG parking standards are set out in their Supplementary Planning Guidance document ôParking Standardsô(2015). The standards, deemed as maximums are set out in **Table 11.1**.

Table 11.1: Vale of Glamorgan's Maximum Parking Standards

Use Class	Size / Type	Parking Ratio	
		Operational	Non-operational
B1 Office	< 1000m^2	1 space per 25m^2	
	> 1000m^2	1 space per 40m^2	
B2 Industry	< 100m^2	1 van space	1 space
	< 235m^2	1 van space	2 spaces
	> 235m^2	10% of GFA	1 space per 80m^2
	High Tech Industry	10% of GFA	1 space per 20m^2
B8 Warehousing / Distribution	Industrial	10% of GFA	1 space per 140m^2
	Storage	1 space per 500m^2	Nil
	Distribution <1000m^2	35% of GFA	1 space per 80m^2
	Distribution >1000m^2	25% of GFA	1 space per 80m^2

11.2 A parking strategy, using these parking standards as a foundation will be evolved to both rationalise parking and to reduce travel to the site by single occupancy vehicles. It will relate to the Travel Plan as appropriate.

12. Points for Discussion

12.1 A meeting is requested with the highway authorities to discuss and agree the scope of the Transport Assessment, in particular in relation to:

- Confirmation that the SATURN model is recently validated and includes traffic flows associated with the Cardiff Airport ï St Athan Enterprise Zone;
- Confirmation that if the model includes the Zoneôs traffic flows that the wider highway network can be considered not to require any further assessment;
- Confirmation that if the model includes the developmentôs traffic flows the highway authorities are content with the currently proposed scope;
- Confirmation of the future years of assessment;
- Confirmation of relevant committed developments;
- Agreement on the developmentôs trip rates;
- Agreement on the approach on assignment;
- Areas that require further work or examination in detail; and
- Any other matters.

APPENDICES

APPENDIX A – RPS DRAWING NO. JNY9283-05

A 4226
Issues
Drain
Farming Land
Existing Hedge and Tree Line
Camping Site
The Vale Hotel & Touring Caravan Park
Meadowcroft
PORT ROAD
BUCKTON LANE
Model Farm
Pond
Proposed Development Site
60.0
2.00
2.30
3.50
A
Unnamed River
Holiday Inn Express
Shelter
Whitelands Brook
House Platform

NOTES

1. This drawing has been prepared in accordance with the scope of RPS's appointment with its client and is subject to the terms and conditions of that appointment. RPS accepts no liability for any use of this document other than by its client and only for the purposes for which it was prepared and provided.
2. If received electronically it is the recipients responsibility to print to correct scale. Only written dimensions should be used.
3. Background layout based on OS mapping dated 18/05/2018
3. Proposed road alignment based on Bruce Gilbreth Architects Ltd, Gate Wales Mixed Use commercial Master Plan, dated 03/08/2010.

KEY

- Proposed Kerb Alignment
- Proposed 2.0m width Footway
- Proposed 7.3m width Carriageway
- Proposed 3.5m width Cyclepath
- Proposed splitter Island

Footway | Carriageway | Cyclepath

2.0 | 3.65 | 3.65 | 3.5

SECTION A-A
TIPYCAL CROSS SECTION

Rev	Description	Date	Initial	Checked

RPS
20 Milton Park
Abingdon, Oxfordshire, OX14 4SH.
T: +44(0)1235 432 190 E: transport@rpsgroup.com F: +44(0)1235 834 698

Client: Bruce Gilbreth Architects Ltd.

Project: Model Farm-Land Near Cardiff Airport

Title: Plan Showing Preliminary Junctions and Route of Access Road Serving New Development

Status	Drawn By	Checked by
Preliminary	CA	LMC
Project Number	Scale @ A1	Date Created
JNY9283	1:1500	June 2018

Drawing Number: JNY9283-05
Rev:

rpsgroup.com

Drawing Ref: P:\JNY9283 - MODEL FARM - LAND NEAR CARDIFF AIRPORT\CHANA\SI\DRAWINGS\JNY9283-05_PRELIMINARY_ROAD_JUNCTION_COMPOSITE LAYOUT.DWG Plotted Date: 6/1/2018 4:57 PM

APPENDIX B – TRICS OUTPUT REPORTS

Calculation Reference: AUDIT-515501-181012-1055

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 02 - EMPLOYMENT
Category : B - BUSINESS PARK
VEHICLES

Selected regions and areas:

04	EAST ANGLIA		
	CA	CAMBRIDGESHIRE	1 days
06	WEST MIDLANDS		
	HE	HEREFORDSHIRE	1 days
	ST	STAFFORDSHIRE	1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE		
	WY	WEST YORKSHIRE	1 days
10	WALES		
	CP	CAERPHILLY	1 days

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

Secondary 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: Gross floor area
Actual Range: 9200 to 20760 (units: sqm)
Range Selected by User: 0 to 142687 (units: sqm)

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/10 to 22/11/17

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:

Tuesday	2 days
Wednesday	3 days

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

Selected survey types:

Manual count	5 days
Directional ATC Count	0 days

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	4
Neighbourhood Centre (PPS6 Local Centre)	1

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:

Industrial Zone	1
Commercial Zone	2
Village	1
No Sub Category	1

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.

Secondary Filtering selection:

Use Class:

B1	5 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Secondary Filtering selection (Cont.):

Population within 1 mile:

1,001 to 5,000	1 days
5,001 to 10,000	3 days
10,001 to 15,000	1 days

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

Population within 5 miles:

25,001 to 50,000	1 days
50,001 to 75,000	2 days
125,001 to 250,000	2 days

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 days
1.1 to 1.5	4 days

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.

Travel Plan:

Yes	1 days
No	4 days

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	5 days

This data displays the number of selected surveys with PTAL Ratings.

LIST OF SITES relevant to selection parameters

1 CA-02-B-02 BUSINESS PARK CAMBRIDGESHIRE
LYNCH WOOD
PETERBOROUGH

Edge of Town
Commercial Zone
Total Gross floor area: 12800 sqm
Survey date: WEDNESDAY 19/10/16 Survey Type: MANUAL

2 CP-02-B-01 BUSINESS PARK CAERPHILLY
VAN ROAD
CAERPHILLY

Edge of Town
Commercial Zone
Total Gross floor area: 14450 sqm
Survey date: TUESDAY 17/07/12 Survey Type: MANUAL

3 HE-02-B-01 BUSINESS PARK HEREFORDSHIRE
A4103
NEAR HEREFORD
WHITESTONE
Neighbourhood Centre (PPS6 Local Centre)
Village
Total Gross floor area: 18808 sqm
Survey date: TUESDAY 13/09/11 Survey Type: MANUAL

4 ST-02-B-04 BUSINESS PARK STAFFORDSHIRE
STONE ROAD
STAFFORD

Edge of Town
Industrial Zone
Total Gross floor area: 20760 sqm
Survey date: WEDNESDAY 22/11/17 Survey Type: MANUAL

5 WY-02-B-02 BUSINESS PARK WEST YORKSHIRE
ARMITAGE BRIDGE
HUDDERSFIELD

Edge of Town
No Sub Category
Total Gross floor area: 9200 sqm
Survey date: WEDNESDAY 23/04/14 Survey Type: MANUAL

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

MANUALLY DESELECTED SITES

Site Ref	Reason for Deselection
CA-02-B-03	GFA
CH-02-B-01	GFA
DV-02-B-01	GFA
LN-02-B-02	GFA
WY-02-B-03	GFA

TRIP RATE for Land Use 02 - EMPLOYMENT/B - BUSINESS PARK
VEHICLES
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	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	5	15204	0.720	5	15204	0.071	5	15204	0.791
08:00 - 09:00	5	15204	1.222	5	15204	0.196	5	15204	1.418
09:00 - 10:00	5	15204	0.609	5	15204	0.183	5	15204	0.792
10:00 - 11:00	5	15204	0.187	5	15204	0.141	5	15204	0.328
11:00 - 12:00	5	15204	0.164	5	15204	0.172	5	15204	0.336
12:00 - 13:00	5	15204	0.283	5	15204	0.333	5	15204	0.616
13:00 - 14:00	5	15204	0.262	5	15204	0.203	5	15204	0.465
14:00 - 15:00	5	15204	0.179	5	15204	0.188	5	15204	0.367
15:00 - 16:00	5	15204	0.159	5	15204	0.388	5	15204	0.547
16:00 - 17:00	5	15204	0.120	5	15204	0.822	5	15204	0.942
17:00 - 18:00	5	15204	0.146	5	15204	0.931	5	15204	1.077
18:00 - 19:00	4	16705	0.045	4	16705	0.500	4	16705	0.545
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			4.096			4.128			8.224

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:	9200 - 20760 (units: sqm)
Survey date date range:	01/01/10 - 22/11/17
Number of weekdays (Monday-Friday):	5
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	5

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 for Land Use 02 - EMPLOYMENT/B - BUSINESS PARK
OGVS
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	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	5	15204	0.008	5	15204	0.005	5	15204	0.013
08:00 - 09:00	5	15204	0.016	5	15204	0.016	5	15204	0.032
09:00 - 10:00	5	15204	0.011	5	15204	0.011	5	15204	0.022
10:00 - 11:00	5	15204	0.007	5	15204	0.008	5	15204	0.015
11:00 - 12:00	5	15204	0.011	5	15204	0.009	5	15204	0.020
12:00 - 13:00	5	15204	0.016	5	15204	0.005	5	15204	0.021
13:00 - 14:00	5	15204	0.004	5	15204	0.012	5	15204	0.016
14:00 - 15:00	5	15204	0.008	5	15204	0.008	5	15204	0.016
15:00 - 16:00	5	15204	0.009	5	15204	0.009	5	15204	0.018
16:00 - 17:00	5	15204	0.005	5	15204	0.013	5	15204	0.018
17:00 - 18:00	5	15204	0.004	5	15204	0.004	5	15204	0.008
18:00 - 19:00	3	17456	0.000	3	17456	0.002	3	17456	0.002
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.099			0.102			0.201

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.*

Calculation Reference: AUDIT-515501-181012-1051

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 02 - EMPLOYMENT
Category : D - INDUSTRIAL ESTATE
VEHICLES

Selected regions and areas:

03	SOUTH WEST		
	CW	CORNWALL	1 days
	DC	DORSET	1 days
06	WEST MIDLANDS		
	WM	WEST MIDLANDS	1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE		
	WY	WEST YORKSHIRE	2 days

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

Secondary 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: Gross floor area
Actual Range: 23226 to 70000 (units: sqm)
Range Selected by User: 20000 to 234115 (units: sqm)

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/10 to 15/09/16

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:

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

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

Selected survey types:

Manual count	5 days
Directional ATC Count	0 days

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:

Suburban Area (PPS6 Out of Centre)	1
Edge of Town	2
Neighbourhood Centre (PPS6 Local Centre)	1
Free Standing (PPS6 Out of Town)	1

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:

Industrial Zone	2
Residential Zone	1
Village	1
Out of Town	1

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.

Secondary Filtering selection:

Use Class:

B2	4 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Population within 1 mile:

1,000 or Less	1 days
5,001 to 10,000	2 days
10,001 to 15,000	1 days
25,001 to 50,000	1 days

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

Population within 5 miles:

25,001 to 50,000	1 days
50,001 to 75,000	2 days
125,001 to 250,000	1 days
500,001 or More	1 days

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	3 days
1.1 to 1.5	2 days

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.

Travel Plan:

No	5 days

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	5 days

This data displays the number of selected surveys with PTAL Ratings.

LIST OF SITES relevant to selection parameters

1 CW-02-D-03 IND. ESTATE CORNWALL
LONG ROCK ROAD
NEAR PENZANCE
LONG ROCK
Neighbourhood Centre (PPS6 Local Centre)
Village
Total Gross floor area: 36500 sqm
Survey date: MONDAY *03/10/11* *Survey Type: MANUAL*

2 DC-02-D-20 INDUSTRIAL ESTATE DORSET
OLD BARN FARM ROAD
NEAR BOURNEMOUTH
THREE LEGGED CROSS
Free Standing (PPS6 Out of Town)
Out of Town
Total Gross floor area: 70000 sqm
Survey date: MONDAY *24/03/14* *Survey Type: MANUAL*

3 WM-02-D-02 INDUSTRIAL ESTATE WEST MIDLANDS
DUNLOP WAY
BIRMINGHAM

Edge of Town
Residential Zone
Total Gross floor area: 23480 sqm
Survey date: WEDNESDAY *07/11/12* *Survey Type: MANUAL*

4 WY-02-D-03 INDUSTRIAL ESTATE WEST YORKSHIRE
ARMLEY ROAD
LEEDS

Suburban Area (PPS6 Out of Centre)
Industrial Zone
Total Gross floor area: 24980 sqm
Survey date: FRIDAY *20/09/13* *Survey Type: MANUAL*

5 WY-02-D-04 INDUSTRIAL ESTATE WEST YORKSHIRE
LAW STREET
CLECKHEATON

Edge of Town
Industrial Zone
Total Gross floor area: 23226 sqm
Survey date: THURSDAY *15/09/16* *Survey Type: MANUAL*

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

TRIP RATE for Land Use 02 - EMPLOYMENT/D - INDUSTRIAL ESTATE
VEHICLES
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	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	5	35637	0.263	5	35637	0.086	5	35637	0.349
08:00 - 09:00	5	35637	0.325	5	35637	0.148	5	35637	0.473
09:00 - 10:00	5	35637	0.199	5	35637	0.148	5	35637	0.347
10:00 - 11:00	5	35637	0.161	5	35637	0.141	5	35637	0.302
11:00 - 12:00	5	35637	0.179	5	35637	0.169	5	35637	0.348
12:00 - 13:00	5	35637	0.155	5	35637	0.154	5	35637	0.309
13:00 - 14:00	5	35637	0.182	5	35637	0.186	5	35637	0.368
14:00 - 15:00	5	35637	0.141	5	35637	0.171	5	35637	0.312
15:00 - 16:00	5	35637	0.130	5	35637	0.185	5	35637	0.315
16:00 - 17:00	5	35637	0.198	5	35637	0.217	5	35637	0.415
17:00 - 18:00	5	35637	0.065	5	35637	0.343	5	35637	0.408
18:00 - 19:00	5	35637	0.047	5	35637	0.103	5	35637	0.150
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			2.045			2.051			4.096

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:	23226 - 70000 (units: sqm)
Survey date date range:	01/01/10 - 15/09/16
Number of weekdays (Monday-Friday):	5
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
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 for Land Use 02 - EMPLOYMENT/D - INDUSTRIAL ESTATE
OGVS
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	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	5	35637	0.014	5	35637	0.011	5	35637	0.025
08:00 - 09:00	5	35637	0.011	5	35637	0.011	5	35637	0.022
09:00 - 10:00	5	35637	0.017	5	35637	0.012	5	35637	0.029
10:00 - 11:00	5	35637	0.015	5	35637	0.016	5	35637	0.031
11:00 - 12:00	5	35637	0.016	5	35637	0.016	5	35637	0.032
12:00 - 13:00	5	35637	0.017	5	35637	0.013	5	35637	0.030
13:00 - 14:00	5	35637	0.015	5	35637	0.016	5	35637	0.031
14:00 - 15:00	5	35637	0.006	5	35637	0.011	5	35637	0.017
15:00 - 16:00	5	35637	0.009	5	35637	0.013	5	35637	0.022
16:00 - 17:00	5	35637	0.011	5	35637	0.014	5	35637	0.025
17:00 - 18:00	5	35637	0.008	5	35637	0.008	5	35637	0.016
18:00 - 19:00	5	35637	0.003	5	35637	0.003	5	35637	0.006
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.142			0.144			0.286

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.*

Calculation Reference: AUDIT-515501-181012-1009

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 02 - EMPLOYMENT
Category : F - WAREHOUSING (COMMERCIAL)
VEHICLES

Selected regions and areas:

02	SOUTH EAST		
	KC	KENT	1 days
04	EAST ANGLIA		
	SF	SUFFOLK	1 days
10	WALES		
	WR	WREXHAM	1 days

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

Secondary 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: Gross floor area
Actual Range: 9000 to 22270 (units: sqm)
Range Selected by User: 634 to 80066 (units: sqm)

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/10 to 22/09/17

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:

Tuesday	1 days
Thursday	1 days
Friday	1 days

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

Selected survey types:

Manual count	3 days
Directional ATC Count	0 days

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:

Suburban Area (PPS6 Out of Centre)	1
Edge of Town	1
Free Standing (PPS6 Out of Town)	1

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:

Industrial Zone	3

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.

Secondary Filtering selection:

Use Class:

B8	3 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Secondary Filtering selection (Cont.):

Population within 1 mile:

1,000 or Less	1 days
1,001 to 5,000	1 days
15,001 to 20,000	1 days

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

Population within 5 miles:

5,001 to 25,000	1 days
50,001 to 75,000	1 days
125,001 to 250,000	1 days

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 days
1.1 to 1.5	2 days

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.

Travel Plan:

No	3 days

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	3 days

This data displays the number of selected surveys with PTAL Ratings.

LIST OF SITES relevant to selection parameters

1 KC-02-F-02 COMMERCIAL WAREHOUSING KENT
MILLS ROAD
AYLESFORD
QUARRY WOOD
Edge of Town
Industrial Zone
Total Gross floor area: 11200 sqm
Survey date: FRIDAY *22/09/17* *Survey Type: MANUAL*

2 SF-02-F-02 WAREHOUSING SUFFOLK
WALTON ROAD
FELIXSTOWE

Suburban Area (PPS6 Out of Centre)
Industrial Zone
Total Gross floor area: 22270 sqm
Survey date: THURSDAY *11/07/13* *Survey Type: MANUAL*

3 WR-02-F-01 WAREHOUSE WREXHAM
UNIT 1-2 PACIFIC PARK
NEAR WREXHAM
WREXHAM IND. ESTATE
Free Standing (PPS6 Out of Town)
Industrial Zone
Total Gross floor area: 9000 sqm
Survey date: TUESDAY *18/10/11* *Survey Type: MANUAL*

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

MANUALLY DESELECTED SITES

Site Ref	Reason for Deselection
BG-02-F-01	GFA
CB-02-F-01	GFA
HC-02-F-02	logistics
LN-02-F-01	book service
SF-02-F-03	GFA

TRIP RATE for Land Use 02 - EMPLOYMENT/F - WAREHOUSING (COMMERCIAL)
VEHICLES
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	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	1	22270	0.018	1	22270	0.040	1	22270	0.058
06:00 - 07:00	1	22270	0.058	1	22270	0.063	1	22270	0.121
07:00 - 08:00	3	14157	0.141	3	14157	0.052	3	14157	0.193
08:00 - 09:00	3	14157	0.099	3	14157	0.061	3	14157	0.160
09:00 - 10:00	3	14157	0.106	3	14157	0.082	3	14157	0.188
10:00 - 11:00	3	14157	0.078	3	14157	0.064	3	14157	0.142
11:00 - 12:00	3	14157	0.064	3	14157	0.066	3	14157	0.130
12:00 - 13:00	3	14157	0.064	3	14157	0.054	3	14157	0.118
13:00 - 14:00	3	14157	0.064	3	14157	0.078	3	14157	0.142
14:00 - 15:00	3	14157	0.075	3	14157	0.092	3	14157	0.167
15:00 - 16:00	3	14157	0.080	3	14157	0.073	3	14157	0.153
16:00 - 17:00	3	14157	0.054	3	14157	0.120	3	14157	0.174
17:00 - 18:00	3	14157	0.028	3	14157	0.104	3	14157	0.132
18:00 - 19:00	3	14157	0.016	3	14157	0.035	3	14157	0.051
19:00 - 20:00	1	22270	0.036	1	22270	0.031	1	22270	0.067
20:00 - 21:00	1	22270	0.013	1	22270	0.031	1	22270	0.044
21:00 - 22:00	1	22270	0.031	1	22270	0.018	1	22270	0.049
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.025			1.064			2.089

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:	9000 - 22270 (units: sqm)
Survey date date range:	01/01/10 - 22/09/17
Number of weekdays (Monday-Friday):	3
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	5

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 for Land Use 02 - EMPLOYMENT/F - WAREHOUSING (COMMERCIAL)
OGVS
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	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	1	22270	0.013	1	22270	0.040	1	22270	0.053
06:00 - 07:00	1	22270	0.027	1	22270	0.063	1	22270	0.090
07:00 - 08:00	3	14157	0.031	3	14157	0.021	3	14157	0.052
08:00 - 09:00	3	14157	0.016	3	14157	0.014	3	14157	0.030
09:00 - 10:00	3	14157	0.033	3	14157	0.028	3	14157	0.061
10:00 - 11:00	3	14157	0.033	3	14157	0.019	3	14157	0.052
11:00 - 12:00	3	14157	0.019	3	14157	0.016	3	14157	0.035
12:00 - 13:00	3	14157	0.019	3	14157	0.019	3	14157	0.038
13:00 - 14:00	3	14157	0.024	3	14157	0.026	3	14157	0.050
14:00 - 15:00	3	14157	0.026	3	14157	0.021	3	14157	0.047
15:00 - 16:00	3	14157	0.031	3	14157	0.019	3	14157	0.050
16:00 - 17:00	3	14157	0.019	3	14157	0.021	3	14157	0.040
17:00 - 18:00	3	14157	0.016	3	14157	0.021	3	14157	0.037
18:00 - 19:00	3	14157	0.009	3	14157	0.014	3	14157	0.023
19:00 - 20:00	1	22270	0.018	1	22270	0.022	1	22270	0.040
20:00 - 21:00	1	22270	0.013	1	22270	0.027	1	22270	0.040
21:00 - 22:00	1	22270	0.027	1	22270	0.004	1	22270	0.031
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.374			0.395			0.769

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.*

APPENDIX C – CENSUS 2011 JOURNEY TO WORK DATA

WP703EW - Method of travel to work (2001 specification) (Workplace population)

population	All usual residents aged 16 to 74 in employment in the area the week before the census
units	Persons
area type	2011 census workplace zones
area name	W35001991

Method of travel to work	2011
Train	26
Bus, minibus or coach	46
Taxi	8
Motorcycle, scooter or moped	21
Driving a car or van	1,423
Passenger in a car or van	87
Bicycle	22
On foot	29

In order to protect against disclosure of personal information, records have been swapped between different geographic areas. Some counts will be affected, particularly small counts at the lowest geographies.

Appendix D – JNY9624-03 Scoping Note Addendum

TECHNICAL NOTE

Project Title:	Land at Model Farm, Rhoose
Report Reference:	JNY9624-03a Second (Final) Stage Scoping
Date:	05 April 2019

1 Introduction

1.1 RPS is working on behalf of Legal and General (Strategic Land) Ltd. in order to address the transportation issues associated with a mixed employment development at Model Farm, Rhoose. The site forms part of the wider Cardiff Airport - St. Athan Enterprise Zone, which is allocated within the Vale of Glamorgan Local Development Plan 2011 – 2026 (adopted June 2017).

1.2 A Transport Assessment Scoping Note (Ref: JNY9624-02), submitted on 06 November 2018 to The Vale of Glamorgan Council (TVoGC) set out the preferred approach for the preparation of an appropriate Transportation Assessment, Transport Implementation Strategy and Travel Plan.

1.3 Since production of the original Scoping Note, the land use profile has been adjusted to reflect TVoGC's wider pre-application advice and now comprises a ratio of 40:20:40, B1:B2:B8. The original Scoping Note was submitted as part of a wider pre-application enquiry.

1.4 The assumed development floor area is now 189,725m^2 Gross Floor Area (GFA). However, the floorspace may be subject to alteration as the scheme progresses.

1.5 This Technical Note sets out additional information associated with the scheme for agreement prior to confirmation of trip assignment and impact by traffic modelling using the Transport for Wales' (TfW's) SEWTM model (Modelling Methodology attached at **Appendix A**). This TN therefore represents the final stage scoping in advance of the general production of the Transportation Assessment work.

2 Background

2.1 The highway authority at TVoGC responded, as part of a wider pre-application response, on 31 January 2019 (Ref: P/DC/2018/00134/PRE). The response stated that the Scoping Note is acceptable in broad terms and the following observations were made (along with the RPS response in **bold**);

i. Transport Assessment required and to include the analysis of the effect of the development on existing movement patterns and proposals for how these are to be managed and highway works, or public transport improvements required to accommodate the development. **Agreed**.

ii. Travel Plan required and to set out how sustainable means of transport are to be promoted and form part of the evidence base for any modal shift upon which the highway assessment is based. **Agreed**.

iii. Area-wide modelling to be undertaken – the highway elements of the SEWTM model is considered acceptable – using SEWTM to identify percentage impacts at key nodes (junctions) on route to M4 is an acceptable approach to help determine the scope and requirement for detailed link and junction assessment. **Agreed and to be provided by Norman Rourke Pryme (NRP) modelling specialists**.

iv. Trip rates should be obtained from TRICS or derived from first principles – key assumptions and calculations will need to be provided – the trip generation provided in the submitted Scoping Note requires refinement. **Agreed and provided here.**

v. Modal shift towards non-car modes will need to be justified and evidence based, relating to the Travel Plan and Public Transport proposal. **Agreed and to be developed in TA work**.

vi. A revised Transport Scoping Note to be prepared and a final scoping report needs to include a chapter setting out the modelling methodology in detail. **Agreed and to be supplied by NRP**.

vii. Subject to SEWTM outputs it is expected that detailed modelling will need to extend from the immediate highway network to the Weycock Cross junction and may also need to include Five Mile Lane, Sycamore Cross and Port Road (to the Barry Dock Link). **To be confirmed in due course.**

viii. Continued liaison with Welsh Government and Transport for Wales in relation to the scope and impacts on the motorway/trunk road network. **Agreed and on-going**.

ix. Consideration of the Sustainable Transport Hierarchy to encourage modal shift. **Agreed**.

a. Walking and cycling: ensure the site is well-connected to Barry and public transport services (Active Travel Act, links to local authority Existing Route Maps and Integrated Network Mapping);

b. Bus: improving access to bus services; improving the frequency of bus services; improving bus infrastructure;

c. Rail: Improving access to Cardiff International Railway Station;

x. The development is not to restrict future sustainable transport options for travel to and from Cardiff Airport (new rail spur/ improvement of existing bus services together with enhanced

walking and cycling infrastructure). **The scheme will be designed not to prejudice other proposals coming forward as appropriate**.

xi. Reference to the forthcoming SPG relating to the Airport and Gateway Development Zone which is anticipated to guide the wider public transport strategy for the area. **Agreed, subject to the draft SPG being published suitably in advance of the planning application submission**.

2.2 A previous version of this Technical Note was sent to TVoGC and TfW on 5th March 2019. A response received on 7th March requested confirmation of future modal share. Subsequent discussions with TVoGC's advisor have led to the modal shares set out in Chapter 5.

2.3 Further to discussion with TVoGC's advisor and email correspondence from TfW t is understood that 2026 and 2036 are agreed as the years for assessing the impact of the development with no earlier year requirement.

2.4 A meeting was held with Kyle Phillips (TVoGC's Group Manager Transport Services) on 12th March 2019 to discuss future public transport provision in the local area which has led to the approach on future modal share.

3 Vehicle Trip Rate and Vehicle Trips Methodology

3.1 The TRICS database has been interrogated further to negotiations to date in order to provide a forecast for the development's trip attraction on weekday morning and evening peak hours.

3.2 The TRICS database provides trip rate information based on surveys of existing trips observed at similar use class sites throughout the United Kingdom.

3.3 The following criteria have been used during the TRICS site selection process to estimate trip data that is representative of the proposed development:

i. Employment Business Park; Employment Industrial Estate and Employment Warehousing (Commercial);
ii. Vehicle surveys (inclusive of those containing multi-modal surveys);
iii. Sites in England, Scotland and Wales excluding Greater London;
iv. Survey dates: 01/01/2008 onwards;
v. GFA of 5,000m^2 and above;
vi. Town Centre, Edge of Town Centre and Suburban sites excluded;
vii. GFA not in use excluded from trip rate calculations;
viii. Sites with Travel Plans excluded; and
ix. Site with a Public Transport frequency of 10 or above services per hour were excluded.

3.4 Journey to Work data from the 2011 Census for Middle Super Output Area (MSOA) 'Vale of Glamorgan 014' has been utilised to produce a proposed modal share profile.

3.5 The Census modal share has been calculated using the following methodology:

i. People not in employment not included;
ii. People working mainly from home not included; and
iii. Public transport modes combined (train, bus, taxi).

3.6 This existing modal share profile has been adjusted to reflect the fact that a robust Travel Plan will be provided to support the proposed development. However, the percentage of pedestrians has been reduced to reflect that areas of the proposed development are above 2km from areas of Rhoose (although 2km is not considered to be an upper limit as RPS considers that 3.2km is realistic for a number of walking journeys (Ref: Para 2.3, Design Manual for Roads and Bridges TD91/05, 2005)).

3.7 Pedestrian and cycling isochrones have been produced for 3.2km and 8km respectively to inform the modal split. The isochrones are attached at **Appendix B**.

3.8 Finally, the adjusted modal share has been used to produce the forecast vehicle trip rates and vehicle trips to be utilised for the traffic modelling going forward.

4 Initial Vehicle Trip Rates and Vehicle Trips

4.1 Using the criteria above, the estimated initial vehicle trip rates and numbers, produced from the TRICS database for the B1, B2 and B8 Use Classes, are shown in **Table 4.1**.

4.2 The TRICS output reports are provided in **Appendices C**, **D** and **E** for the B1 Use, B2 Use and B8 Use respectively.

Table 4.1: Initial Vehicle Trip Rates and Vehicle Trips

Time	Arrivals		Departures		Two-way	
B1 Office (75,890m²)						
	Trip Rate	**Trips**	**Trip Rate**	**Trips**	**Trip Rate**	**Trips**
AM Peak (08:00-09:00)	1.313	996	0.217	165	1.53	1161
PM Peak (17:00-18:00)	0.156	118	0.995	755	1.151	873
12 Hour (07:00 – 19:00)	4.697	3,565	4.698	3,565	9.395	7,130
B2 General Industrial (37,945m²)						
	Trip Rate	**Trips**	**Trip Rate**	**Trips**	**Trip Rate**	**Trips**
AM Peak (08:00-09:00)	0.276	105	0.118	45	0.394	150
PM Peak (17:00-18:00)	0.053	20	0.325	123	0.378	143
12 Hour (07:00 – 19:00)	1.695	643	1.801	683	3.496	1,327
B8 Storage & Distribution (75,890m²)						
	Trip Rate	**Trips**	**Trip Rate**	**Trips**	**Trip Rate**	**Trips**
AM Peak (08:00-09:00)	0.091	69	0.048	36	0.139	105
PM Peak (17:00-18:00)	0.024	18	0.086	65	0.110	83
12 Hour (07:00 – 19:00)	0.906	688	1.006	763	1.912	1,451
TOTAL						
		Trips		**Trips**		**Trips**
AM Peak (08:00-09:00)		1,170		246		1,416
PM Peak (17:00-18:00)		156		943		1,099
12 Hour (07:00 – 19:00)		4,896		5,011		9,908

5 Modal Share

5.1 The modal share, taken from the 2011 Census 'Journey to Work by Method of Travel' for the MSOA 'Glamorgan 014' and the forecast modal share (that reflects a 18.9% reduction in Single Occupancy Vehicle use through the implementation of a robust Travel Plan) is shown in **Table 5.1.** The Census output data is attached at **Appendix F**.

5.2 The Travel Plan measures are to be confirmed but at this stage are likely to include the following:

- Steering Group;
- Travel Plan Co-ordinator(s);
- New / enhanced bus service frequencies and associated public transport infrastructure;
- Pedestrian infrastructure linking to existing routes;
- Cycle parking;
- Cycle infrastructure linking to existing routes;
- Motorcycle parking;
- Showers, changing facilities and lockers;
- Parking strategy together with parking restrictions on internal roads;
- Car sharing priority parking spaces;
- Promotion of travel by walking, cycling, public transport and car sharing including PTP; and
- Trip banking from PTP at local residential areas (tbc).

5.3 A meeting with TVoGC's Group Manager Transport Services on 12th March confirmed the following in respect of future transport provision:

- Rail services at Rhoose will increase from 1 train per hour to two trains per hour in 2022/23 and bus links increased to match;
- The T9 bus service could form a basis of good bus connection (additional bus stops with possibly the requirement for additional bus(es));
- Penetration within the site by the 303 bus service is a realistic opportunity; and
- Active travel route along Port Road and A4226 to Weycock Cross roundabout (the development could deliver a route along the spine road as an alternative to Port Road).

Table 5.1 Initial and Proposed Modal Share		
Method of Travel to Work	**2011 Census Data**	**Travel Plan Adjusted**
On Foot	14.4%	5.0%
Bicycle	3.9%	10.0%
Rail (with bus connection)	1.4%	2.5%
Bus	1.9%	12.5%
Motorcycle	1.2%	2.5%
Passenger in a car or van	5.0%	10.0%
Driving a car or van	70.9	57.5%
Other	1.4%	0%
Total	100.0%	100.0%

6 Proposed Vehicle Trip Rates and Vehicle Trips

6.1 The forecast adjusted vehicle trip rates and vehicle trips which will be delivered through the proposed infrastructure and implementation of the Travel Plan are shown in **Table 6.1**.

Table 6.1: Proposed Vehicle Trip Rates and Vehicle Trips

Time	Arrivals		Departures		Two-way	
B1 Office (75,890m²)						
	Trip Rate	**Trips**	**Trip Rate**	**Trips**	**Trip Rate**	**Trips**
AM Peak (08:00-09:00)	1.065	808	0.176	134	1.241	942
PM Peak (17:00-18:00)	0.127	96	0.807	612	0.933	708
12 Hour (07:00 – 19:00)	3.809	2,891	3.810	2,891	7.619	5,782
B2 General Industrial (37,945m²)						
	Trip Rate	**Trips**	**Trip Rate**	**Trips**	**Trip Rate**	**Trips**
AM Peak (08:00-09:00)	0.224	85	0.096	36	0.320	121
PM Peak (17:00-18:00)	0.043	16	0.264	100	0.307	116
12 Hour (07:00 – 19:00)	1.375	522	1.461	554	2.835	1,076
B8 Storage & Distribution (75,890m²)						
	Trip Rate	**Trips**	**Trip Rate**	**Trips**	**Trip Rate**	**Trips**
AM Peak (08:00-09:00)	0.074	56	0.039	30	0.110	86
PM Peak (17:00-18:00)	0.019	15	0.070	53	0.090	68
12 Hour (07:00 – 19:00)	0.735	558	0.816	619	1.550	1,177
TOTAL						
	Trip Rate	**Trips**	**Trip Rate**	**Trips**	**Trip Rate**	**Trips**
AM Peak (08:00-09:00)		949		199		1,148
PM Peak (17:00-18:00)		127		765		892
12 Hour (07:00 – 19:00)		3,970		4,065		8,035

6.2 A 12-hour profile of vehicle trip rates and vehicle trips for each Use Class and vehicle trips for the total development for both the initial TRICS analysis and the proposed trip rates is shown in tables attached at **Appendix G**.

7 Way Forward

7.1 Confirmation that the issues addressed in this technical note are agreed is now sought from VoG highway authority, TfW and Welsh Government.

Appendices

Appendix A – Modelling Methodology Report

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traffic and transportation

Model Farm, Cardiff

Strategic Transport Modelling Methodology

Produced for RPS

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Report

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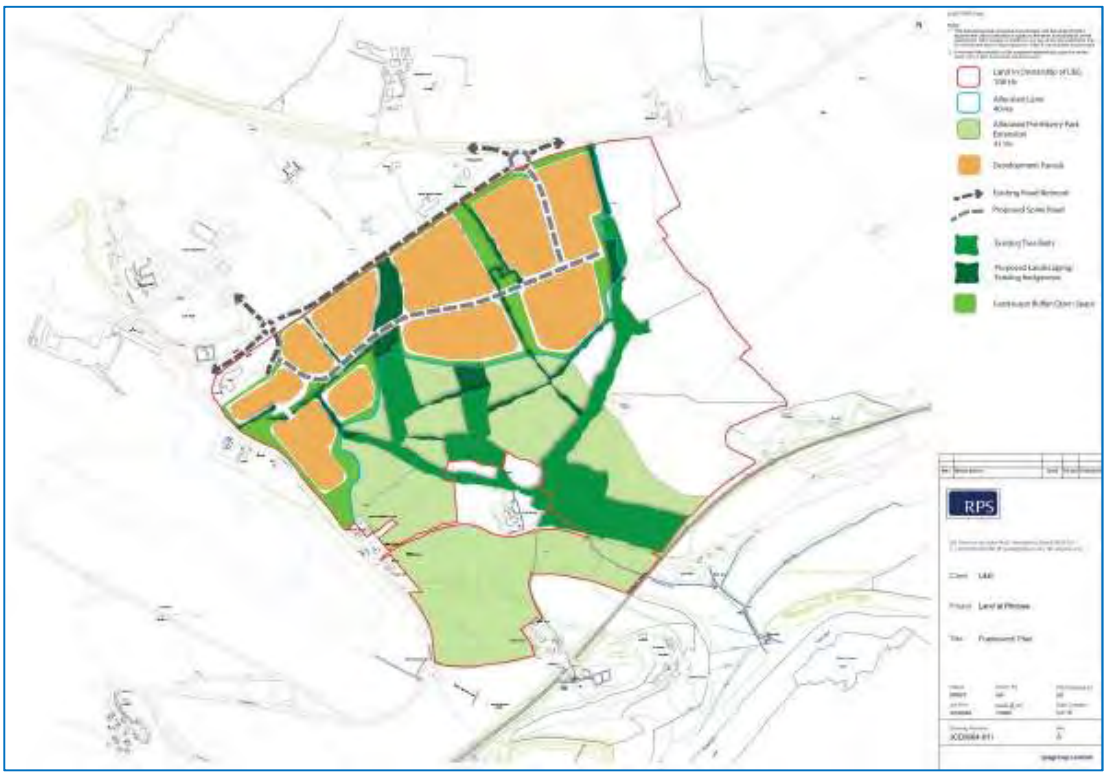
1 INTRODUCTION

1.1.1 This report presents a methodology summary of the assessment of the impact the Model Farm Local Plan development is likely to have on the local highway network. The assessment will be undertaken using a computerised transport model that predicts future year conditions based upon a validated and calibrated existing condition model.

1.1.2 The site is located immediately east of Cardiff Airport, as shown in Figure 1.1. The development will consist of a mix of employment land uses (B1, B2 and B8).

Figure 1.1: Development site location



1.2 EVIDENCE BASE

1.2.1 The South East Wales Transport Model (SEWTM) - Strategic Highway Model will be used as the basis for the scheme assessment. The base year of the SEWTM is 2015 and the model was developed to represent average weekday AM peak period (07:00 - 09:30) and PM peak period (15:30 - 18:00).

1.2.2 The model development was guided by the following units of the DfT's WebTAG guidance:

- Unit M1 "Principles of Modelling and Forecasting"(January 2014)
- Unit M1.2 "Data Sources and Surveys" (January 2014)
- Unit M3.1 "Highway Assignment Modelling" (January 2014).

1.2.3 The SEWTM was developed using PTV VISUM, a software program for strategic traffic and transport analyses and forecasts.

1.2.4 The simulation area of the SEWTM is shown in Figure 1.2.

Figure 1.2: Simulation area of SEWTM

1.2.5 The performance of the base year highway model was examined through comparison of modelled and observed total counts on links, screenlines and cordons, junction turning counts as well as journey times along selected routes and routing comparison.

1.3 STRUCTURE OF THE DOCUMENT

1.3.1 This report is intended to form part of transport assessment methodology technical notes in order to support the assessment of the development site in the emerging West Cardiff area. The modelled forecast scenarios will enable the detailed assessment of the impact of this potential commercial development on those parts of the highway most likely to be affected, based upon the spatial layout of the site allocation. The strategic modelling will be focusing on where detrimental traffic conditions might exacerbate junction delays and queues and where mitigation may be required in the form of infrastructure improvements, demand management or softer policy measures.

1.3.2 The main body of the report covers the following chapters:

- Chapter 2. Forecasting Methodology
- Chapter 3. Evaluation and Presenting Results

2 FORECASTING METHODOLOGY

2.1 FORECAST SCENARIOS

2.1.1 The strategic transport modelling work element of the project will consist of the following modelled scenarios and all the associated model runs and model output analysis according to the requirements set by Transport for Wales (TfW), The Vale of Glamorgan Council (TVOGC) and Welsh Government:

- Base Year (2015);
- Future Year (2026)
- Future Year (2036);
- Future Year (2026) + Model Farm; and
- Future Year (2036) + Model Farm.

2.1.2 Three forecast scenarios will be produced and run through the SEWTM to enable the analysis of impact of this development in the forecast years of 2026 and 2036.

- **Scenario A:** will include planned developments outside the local area and committed developments in the local area but does not include the Model Farm development.
- **Scenario B:** based on Scenario A but also includes this Local Plan development in the local area
- **Scenario C:** based on Scenario B but also includes mitigation measures on the highway infrastructure.

2.1.3 **Scenario A** will be prepared representing the future years of 2026 and 2036 AM peak and PM peak highway conditions. Scenario A will provide a future case with baseline conditions representing the minimum projected development in the intervening years. In this case it represents a scenario devoid of any Local Plan sites and only includes:

- planned development outside the local area;
- committed dwellings within the local area as provided in the housing trajectory; and
- committed jobs within the local as provided in the job trajectory.

2.1.4 Planned development outside the SEWTM was accounted for in the model using national projections. Car growth was obtained from TEMPRO version 7.1, a software tool that provides projections of growth over time for use in transport models based on outputs from the National Trip End Model (NTEM). NTEM version 7.1 datasets were used for forecasting future growth. NTEM trip growth projections refer to future trip demand due to changes in demography, land use and changes in car ownership and trip rates. It assumes trip costs at base year levels, and it does not allow for changes in travel times, perceived value of time, cost of fuel, and other car operating costs.

2.1.5 **Scenario B** will apply the same TEMPRO v7.1 growth factors (cars) and regional growth traffic (LGV and HGV) forecasts outside the local area and committed development in the local area as Scenario A but also includes the development site as defined in the project specification in accordance with the size and parameters of the Model Farm.

2.1.6 In addition, all the committed highway infrastructure schemes in Scenario A will be also considered in Scenario B. Scenario B will also include any development site related highway infrastructure developments.

2.1.7 **Scenario C** will also include the site infrastructure mitigation of the scheme on top of all highway infrastructure development coded into Scenario A and B.

2.2 MODEL REFINEMENT

2.2.1 The refinement of the current territory model (demand zone system) in SEWTM may be required in order to ensure that the model can properly accommodate the development site and it is suitable and accurate enough to calculate wider traffic impact.

2.2.2 Traffic zones in the proximity (simulation area) of the development site may be disaggregated using, but not limited to, potential data sources such as land use data and Census data.

2.2.3 Disaggregation of traffic zones by using external data sources for weighting the origin, destination and corresponding production and attraction factors respectively will also involve the disaggregation of origin-destination (OD) matrices. Re-distribution of existing internal trips may be considered if the information is stored in the current 2026 forecast year matrices and this will then be replicated for forecast year 2036.

2.2.4 In addition, the highway network can also be extended by using OpenStreetMap data to make sure that the network model can accommodate the local / internal traffic of the refined West of Cardiff area.

2.3 TRIP GENERATION

2.3.1 In order to produce trips from the anticipated developments in the SEWTM included within Scenario A and Scenario B a trip rate must be applied to the development quantum. This trip rate is produced in TRICS®, which is the UK and Ireland's national system of trip generation analysis, containing over 7,150 directional transport surveys at over 110 types of development.

2.3.2 The trip rates will be applied to the site based on the land use and split into all assignment model user classes using the proportions from the base year trip matrix totals.

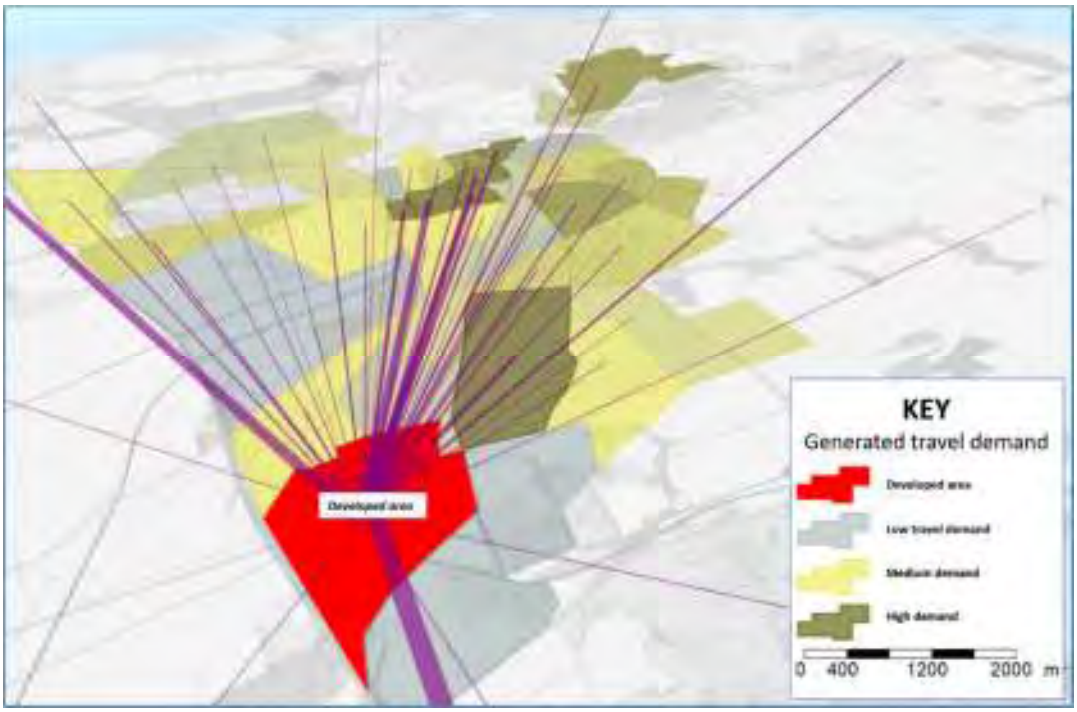
2.3.3 RPS will provide trip rates and trip generation as agreed with TfW, TVOGC and Welsh Government.

2.3.4 It should also acknowledged that the modelled time period may be different from the absolute peak hour of the day.

2.4 TRIP DISTRIBUTION

2.4.1 The new development site distribution will be based on the 2015 base and both 2026 and 2036 future year modelled existing zone distribution with the similar land use and averaged before being applied to the committed and local plan sites. An example of this type of output is provided in Figure 2.1 below.

Figure 2.1: Output of a trip distribution (example)



2.4.2 By undertaking the trip distribution exercise, we will directly get the origin-destination trips associated with the development sites for all transport systems and demand segments of the highway assignment model. The same exercise will be executed for all forecast years and assignment time intervals to ensure the consistency across of all time period of the highway assignment model. Thus, the generated trips can be directly used in the updated matrices which then need to be revised to meet with all corresponding criteria, see the more detailed discussion in Chapter 2.5.

2.5 REVISED FORECAST YEAR MATRICES

2.5.1 In the updated 2026 and 2036 matrices, including the trips associated with the Model Farm development, the total number of trips will be maintained in accordance with WebTAG Unit 4 – Forecasting and Uncertainty (January 2014). This means a constant value across trip ends in the matrices on the level of the National Transport Model zoning system represented by TEMPRO software. This will also ensure that no double counting of the trips associated with the Model Farm development will take place. Updating the matrices with the Model Farm trips will be consist of three key steps:

- Calculating and adding trips of the development site;
- checking TEMPRO constraint trip end numbers in forecast matrices; and
- scaling back existing trips in order to meet TEMPRO growth rates and corresponding WebTAG criteria.

2.5.2 The revised forecast year matrices will be validated and tested against the current 2026 forecast year matrices in terms of the following key validation criteria:

- Matrix and trip end totals;
- trip length distribution;
- trip distribution on sector level; and
- journey time information on key routes.

3 EVALUATION AND PRESENTING RESULTS

3.1.1 To determine the impact of the development on the highway network the analysis will be undertaken for both the 2026 and 2036 AM peak and PM peak hours and will consider:

- Junction Level of Service (LoS);
- journey times on selected routes, which demonstrate the impact on travel conditions within the modelled area; and
- link flow analysis and creating various traffic flow difference plots.

3.1.2 To understand the incremental changes associated with development growth outside and inside the simulation area Scenario A will be compared against base and Scenario B will be compared against Scenario A. The same comparisons will also be undertaken for Scenario C.

3.2 JUNCTION LEVEL OF SERVICE

3.2.1 To undertake the assessment of the impact of the development of the sites included, the junctions throughout simulation area will be assessed and monitored in each scenario.

3.2.2 Full analysis of Level of Service (LoS) at junctions and turns within junctions will be undertaken to form a complete picture of how development in the area would impact on junctions and the traffic network within SEWTM. An explanation of Levels of Service is given in Table 3.1.

Table 3.1: Assessment year scenarios

LoS	Interpretation	RFC value
A	Uncongested operations; all queues clear in a single cycle (if junction is signalised).	< 0.60
B	Very light congestion; an occasional approach phase is fully utilised	0.60 – 0.69
C	Light congestion; occasional backups on critical approaches	0.70 – 0.79
D	Significant congestion on critical approaches, but junction is functional. Cars required to wait through more than one cycle during short peaks. No long-standing queues formed.	0.80 – 0.89
E	Severe congestion with some long-standing queues on critical approaches. Blockage of intersection may occur if traffic signal does not provide for protected turning movements (yellow box). Traffic may block back to upstream junctions.	0.90 – 0.99
F	Total breakdown. Stop and go operation.	>=1.00

3.2.3 A direct comparison of junctions with LoS D, E or F for the base year, Scenario A, Scenario B and Scenario C will be carried out to fully understand the step change and impact of the development on the surrounding network. Junctions will be highlighted and reported where the node as a whole is performing at a LoS D, LoS E or LoS F. At these junctions, an average LoS will be calculated as weighted averages across all turning movements, which may hide some of the congestion issues.

3.2.4 In addition, therefore, all individual turning movements with LoS E or LoS F will be also extracted. This ensures that all the junctions where significant congestion and queuing behaviour will be observed within the model are captured.

3.3 JOURNEY TIMES

3.3.1 Travel times provide a representation of network performance that is easier for a wide audience of readers to understand. A series of routes will be identified to assess network performance, including a wide range of routes that provide representative journey times across the network.

3.3.2 The results of the journey time routes for both time periods in each of the scenarios as well as comparisons between the different scenarios will be presented in graphs and tables. The tables shall demonstrate the absolute difference (in seconds) and percentage difference between the various scenarios being assessed.

Figure 3.1: Extended journey time analysis (example)

3.3.3 Graphs comparing the base year, Scenario A, Scenario B and Scenario C for each of the time periods will also be produced. A detailed list of all the timing points used for the assessment will also be presented in the final report. The journey time routes will be plotted by distance in the graphs, in order to show where delay can occur and highlight junctions that potentially require mitigation. An example output is provided at Figure 3.1.

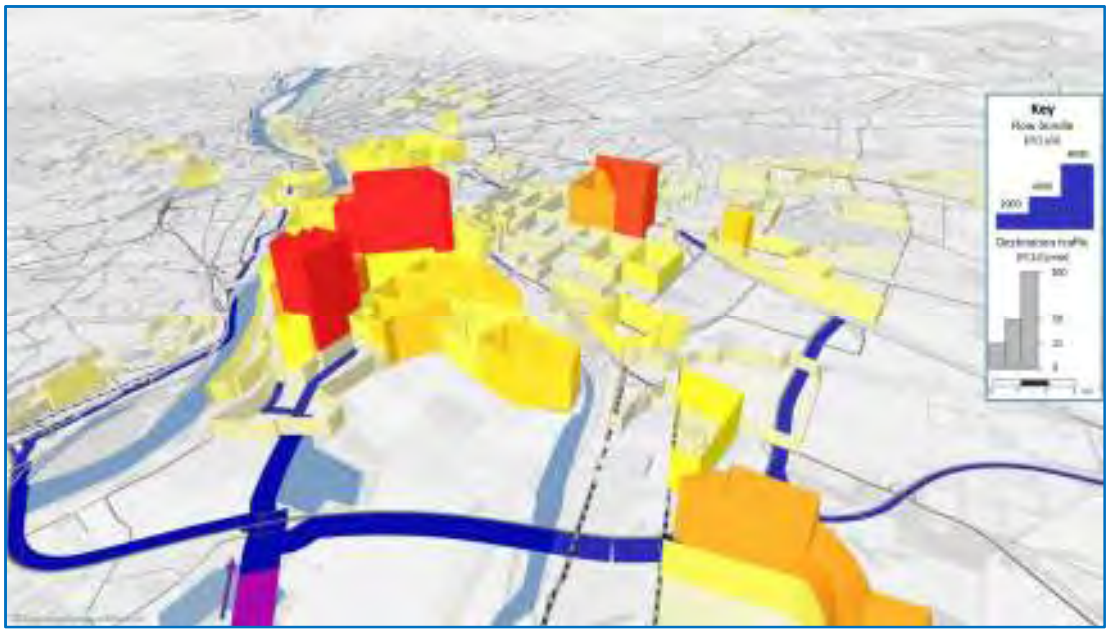
3.4 COMPARISON AND ANALYSIS OF TRAFFIC FLOWS

3.4.1 Traffic flow analysis will be carried out on various levels and comparison plots will be produced in order to be able to examine the relative impact of the development against the future year base network. Data and graphical outputs, shown as examples in Figures 3.2, 3.3 and 3.4, will be extracted for the following network objects:

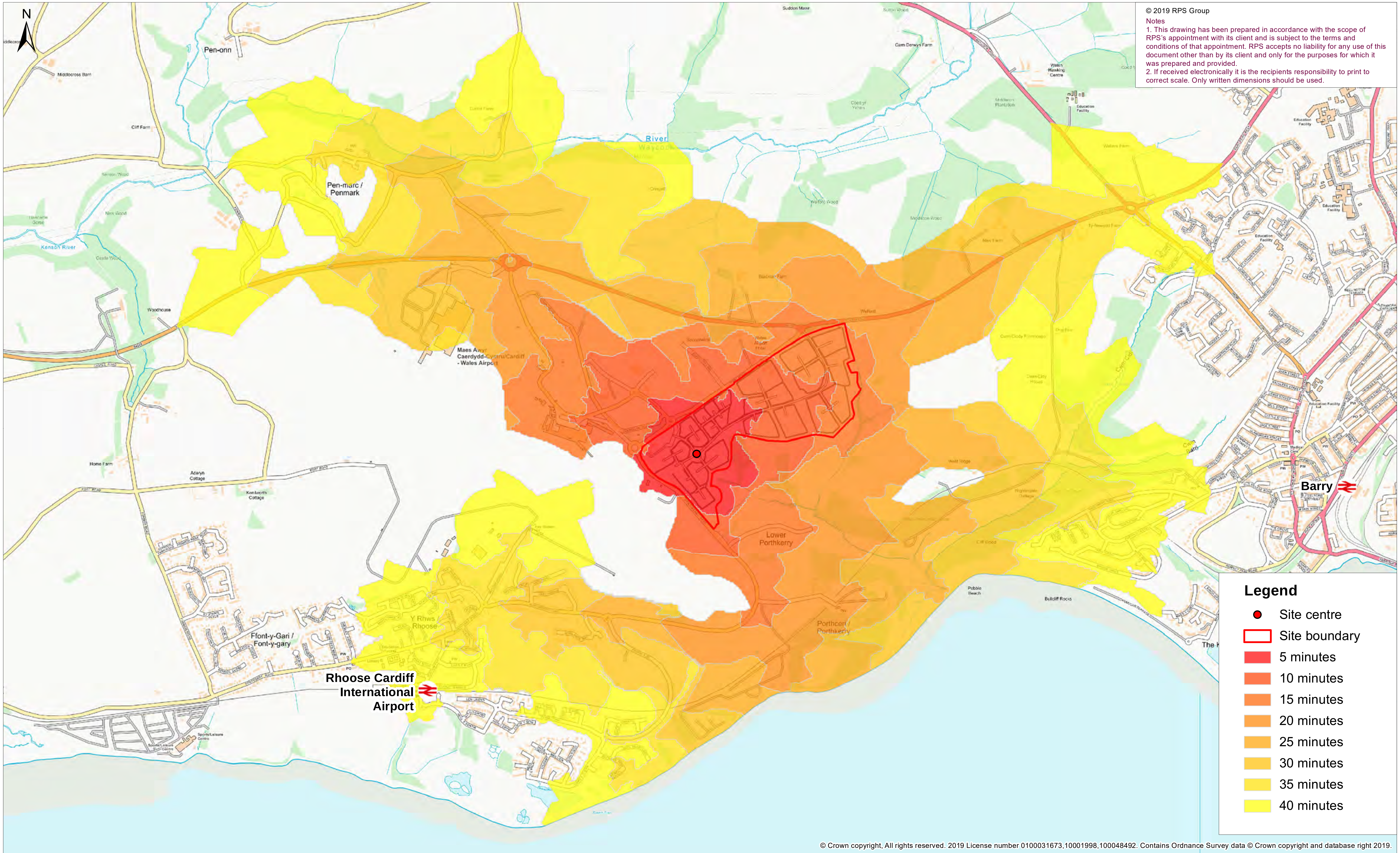
Figure 3.2: Relative traffic flow difference on the entire network (example)

- Link traffic flows – to display and analyse relative and absolute change in number of vehicles on the local and wider highway network;
- Turning movements – to provide input data for further micro-level traffic assessments;
- Traffic flows of screen lines – to ensure that the magnitude of the traffic is maintained in the West Cardiff area;
- Link flow bundle analysis – to analyse the origin-destination movements of the key sections on the network; and
- Accessibility analysis of key objects in the simulation area.

Figure 3.3: Detailed flow bundle analysis of the selected link (example)



Appendix B – Pedestrian and Cycling Isochrones



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Rev	Description	By	CB	Date

Figure Number: 3
Rev: -

Client: Legal and General Capital
Project: Model Farm
Title: Western Walk Isochrone

Status: DRAFT
Drawn By: BG
PM/Checked By: CM
Project Number: JNY9624
Scale @ A3: 1:17,000
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