Response to LHA consultation report

Land at Penllergaer Business Park

Stantec

Prepared for:
Stoford Properties Ltd

Prepared by:
Lizzie Clark

Date:
30 January 2026

Project/File:
35251-HYD-XX-XX-RP-TP-1002-P05

Stantec UK Limited

Revision Record

Revision	Description	Author	Date	Quality Check	Date	Independent Review	Date
P01	For comment and review	EC	20.01.26	JB	22.01.26	JS	22.01.26
P02	For final submission	EC	22.01.26	JB	22.01.26	JS	22.01.26
P03	For client submission	EC	22.01.26	JB	22.01.26	JS	22.01.26
P04	For final submission	JB	30.01.26	AB	30.01.26	AB	30.01.26
P05	For final submission	EC	05.02.26	AB	05.02.26	AB	05.02.26

Disclaimer

The conclusions in the Report titled Response to LHA consultation report are Stantec's professional opinion, as of the time of the Report, and concerning the scope described in the Report. The opinions in the document are based on conditions and information existing at the time the scope of work was conducted and do not take into account any subsequent changes. The Report relates solely to the specific project for which Stantec was retained and the stated purpose for which the Report was prepared. The Report is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorized use or reliance is at the recipient's own risk.

Stantec has assumed all information received from Stoford Properties Ltd (the "Client") and third parties in the preparation of the Report to be correct. While Stantec has exercised a customary level of judgment or due diligence in the use of such information, Stantec assumes no responsibility for the consequences of any error or omission contained therein.

This Report is intended solely for use by the Client in accordance with Stantec's contract with the Client. While the Report may be provided by the Client to applicable authorities having jurisdiction and to other third parties in connection with the project, Stantec disclaims any legal duty based upon warranty, reliance or any other theory to any third party, and will not be liable to such third party for any damages or losses of any kind that may result.

Table of Contents

1 Introduction 2
1.1 Overview 2
1.2 Purpose of report 2
2 Swept path analysis 4
3 Parking 6
4 Site access / Section 278 works 8
5 Transport Assessment 10
6 Mitigation measures 12
7 Welsh Government Response 14
8 Additional items 15
8.1 Travel Plan 15
8.2 Construction Traffic Management Plan 15

List of Tables

Table 5-1 Proposed development trip generation (sensitivity test) 11
Table 7-1 Junction 46 and 47 - Mean Queue (vehicles) 14

List of Figures

Figure 2-1 Minor overhang of a 18m articulated vehicle 4
Figure 2-2 18m articulated vehicle safety manoeuvring at the Heol Y Ddraig access junction 5
Figure 4-1 Dropped kerbs and tactile paving along the main pedestrian desire lines 9
Figure 6-1 Mitigation Measures M4 Junction 47-A48: Option B 13

List of Appendices

Appendix A LHA Consultation Response
Appendix B 18m articulated vehicle safety manoeuvring at the Heol Y Ddraig access junction
Appendix C Vehicle Movement Strategy
Appendix D Site layout
Appendix E Sensitivity Test Modelling Report
Appendix F Mitigation Measures M4 Junction 47-A48: Option B

1 Introduction

1.1 Overview

This Technical Note has been prepared by Stantec on behalf of Stoford Properties Ltd following the Local Highway Authority (LHA) consultation response received on 19th January 2026 in relation to planning application 2025/2027/FUL.

The planning application is in support of the redevelopment of Mechatronics Systems Wales Ltd to provide a Distribution Centre on land at Penllergaer Business Park. As part of the development, it is proposed to provide 12,465m^2 (GEA) of B8 and ancillary B1 use classes, together with associated parking, servicing yard areas, landscaping and engineering works, including modifications to the existing access junction including the provision of a fourth arm on the existing Heol Y Ddraig roundabout junction.

A planning application was submitted in 2025 (2025/2027/FUL) for the demolition of existing buildings/structures and erection of a single storage and distribution unit. This application was supported by the following transport planning documents:

- Transport Assessment: 35251-HYD-XX-XX-RP-TP-5000.P06
- Model Validation Report: 35251-HYD-XX-XX-RP-TP-8001.P02
- Future Year Modelling Report: 35251-HYD-XX-XX-RP-TP-8002.P03
- Tavel Plan: 35251-HYD-XX-XX-RP-TP 6000.P02
- Draft Construction Traffic Management Plan: 35251-HYD-XX-XX-RP-TP-1000.P02
- Active Travel Audit: 35251-HYD-XX-XX-RP-TP-1001.P01
- Stage 1 RSA – Brief: 35251-HYD-XX-XX-RP-TP-9000.P02
- Stage 1 RSA - Designer's Response: 35251-HYD-XX-XX-RP-TP-9001.P03
- Land at Penllergaer Business Park, Swansea. RSA 1: RW-DC-25-4754-RSA1
- Stage 1 RSA Brief Junction 47: 35251-HYD-XX-XX-RP-TP-9003. P01
- Stage 1 RSA Designer's Response Junction 47: 35251-HYD-XX-XX-RP-TP-9004
- Stage 1 RSA Road Safety Audit M4 Junction 47: 250709 M4 Junction 47 1 Final

In January 2026, LHA submitted their consultation response in relation to planning application 2025/2027/FUL. This is presented in full in Appendix A.

1.2 Purpose of report

This Technical Note has been produced following the LHA consultation response received in relation to planning application 2025/2027/FUL. A summary of the key points which were raised by the LHA are set out below:

- **Swept path analysis:** A review of the 18m articulated vehicle tracking indicates that a larger HGV cannot access the distribution warehouse loading bay without significant encroachment into adjacent carriageways on two occasions.
- **Parking:** LHA currently considers the parking strategy presented within the application to be inconsistent with adopted planning policy and therefore non-compliant with SPG requirements.
- **Site access / Section 278 works:** including the design of S278 works, HGV manoeuvres, provision of a zebra crossing on the minor arm of the proposed Heol Y Ddraig access junction.

- **Transport Assessment:** lack of information in relation to warehouse staff and the associated trip generation that would result from this element.
- **Mitigation measures:** reliance on reinstating a measure that was previously trialled and proven unsuccessful as the sole mitigation strategy to offset the development's transport impacts raises significant safety concerns.
- **Welsh Government Response:** Quantification of both the existing and proposed queue length on the M4 junction 46 and 47 off slips, during peak periods to determine the impact of the development on the motorway network.

Following this introductory section, this Technical Note provides a response to the queries raised by the LHA.

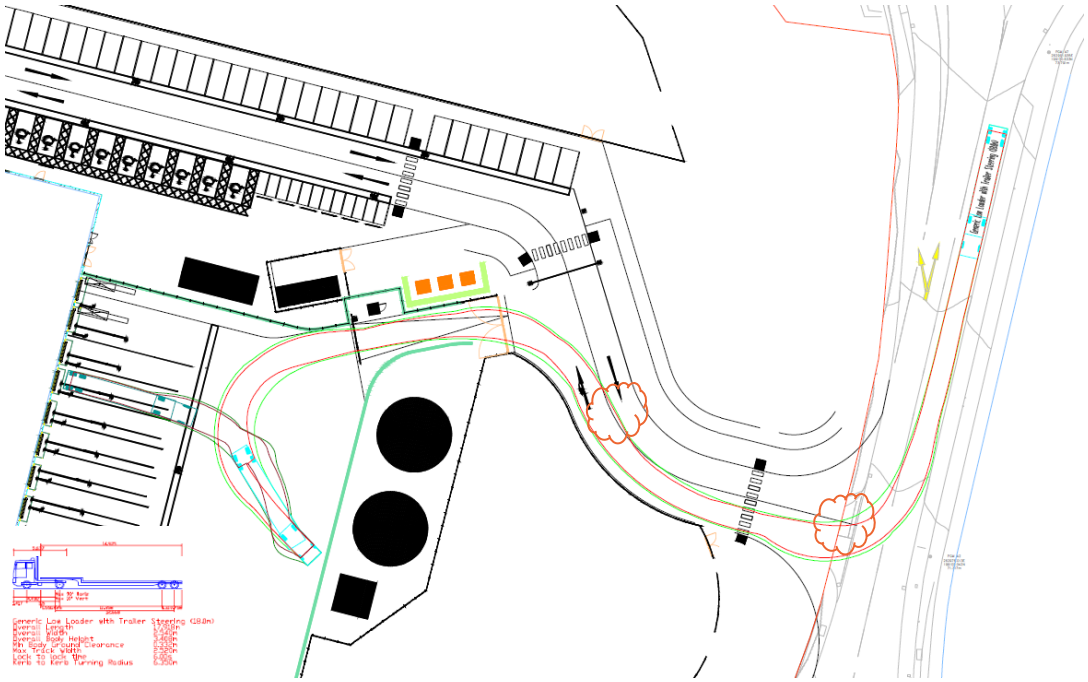
2 Swept path analysis

The consultation response received from Swansea LHA states that:

> *"A review of the 18m articulated vehicle tracking indicates that a larger HGV cannot access the distribution warehouse loading bay without significant encroachment into adjacent carriageways on two occasions.*
>
> *First, both the wheel and body paths cross the junction centre line when entering the Heol Y Ddraig access junction.*
>
> *Second, the wheel and body tracking again cross the carriageway centre line as the vehicle approaches the loading bay access gate. This is particularly concerning as the proposed access road is intended to be shared with general warehouse staff and site visitors for parking. Such encroachment by larger HGVs could create operational conflicts and increase safety risks for anyone leaving the general car park when warehouse deliveries are undertaken"*

As set out in Appendix D of the Transport Assessment submitted in support of planning application 2025/2027/FUL (35251-HYD-XX-XX-RP-TP-5000.P06), drawing 5251-HYD-XX-XX-DR-TP-0109.P01 shows that a 18m articulated vehicle can access the site via the Heol Y Ddraig access junction and into the loading bay access gate.

The drawing submitted at planning shows a minor body overhang onto the adjacent carriageway at the Heol Y Ddraig access junction, and onto the opposing carriageway when manoeuvring into the loading bay access gate, as shown in Figure 2-1 below.



The swept paths analysis has been updated to show that the 18m articulated vehicle can safely access the development site without any body overhang onto the adjacent carriageway at the Heol Y Ddraig access junction, and onto the opposing carriageway when manoeuvring into the loading bay access gate. This is shown in Figure 2-2 below, and presented in full in Appendix B.



Figure 2-2 18m articulated vehicle safety manoeuvring at the Heol Y Ddraig access junction

The swept path analysis carried out demonstrates that the layout is capable of accommodating all HGV types and the layout meets the adoptable standards.

3 Parking

The LHA consultation response states that:

> *"It is noted that the proposed quantity of parking for both operational and non-operational uses represent a significant increase compared to the existing site allocation. This increase is understandable given the change of use proposed within the application"*

However, goes onto to state that:

> *"Considering the SPG parking standards guidance, the overall quantum of operational parking does not comply with current requirements. In particular, the calculation for staff parking based on gross floor area indicates that the provision of 221 spaces exceeds the maximum permitted under SPG."*

A Vehicle Movement Summary has been submitted to the LHA which sets out the context on the intended operation of the site's parking arrangements. This is presented in full in Appendix C and provides a description of both the operational and non-operation parking provision.

Operational Vans

Within the Vehicle Movement Strategy this sets out a rationale for the need to store fleet vehicles on-site overnight, as drivers are not allocated dedicated vehicles for home use. Drivers will travel to the site by their own means, collect a delivery vehicle for their rounds, and return it to the site upon completion before departing via their original mode of transport. The proposed level of operational space within the development site provides a sufficient space for this arrangement, which is also support in City and County of Swansea Parking Standards SPG, which states that:

> *"If the premises are to be used as a distribution depot, adequate space should also be provided to accommodate commercial vehicles that are likely to be parked overnight"*

Furthermore, City and County of Swansea Parking Standards SPG, which states that:

> *"Relaxation permitted for operational space when special servicing arrangements are made"*

This shows that the operational van provision onsite has been provided to accommodate the likely operations of the distribution centre, which is also supported by City and County of Swansea Parking Standards.

Parking

For staff and visitor parking for distribution centres (greater than 1,000m^2 within Zones 5&6) City and County of Swansea Parking Standards requires one space to be provided per 80m^2. For the proposed distribution centre of 12,465m^2 this equates to a total of 156 car parking spaces.

It is important to note that warehouse staff in last mile facilities such as this generally operate on a 24/7 basis which means the usual assumptions about modal shift do not apply. Therefore, the parking onsite has been designed to accommodate an element of overlap of parking for the warehouse staff on site and to reflect the potential for staff to arrive outside of the hours where other public transport methods

may not be available / operational. This has led to a greater parking requirement for non-operational parking, compared to that for a typical distribution centre set out in City and County of Swansea Parking Standards. Furthermore, as the proposed development is bespoke to the operation as a last mile facility, the parking has been assessed to facilitate a smooth operation of the unit and to ensure there is sufficient parking for staff.

Due to the size of the distribution centre, the provision of 221 car parking spaces onsite is sufficient to accommodate the likely parking demand generated by onsite staff, together with the provision of visitor parking onsite. The onsite layout has been designed to accommodate all of the likely parking demand on-site, without over-spilling onto the surrounding local highway network.

Traffic Regulation Order

The LHA consultation response states that:

> *"to mitigate the risk of staff overspill parking on the adjacent adopted highway, should on-site provision prove insufficient, a Section 106 contribution will be required from the developer. This contribution will fund the implementation of a Traffic Regulation Order (TRO) along the site approach road, introducing parking restrictions to prevent staff vehicles from parking on the adjacent adopted highway"*

However, as set out above, even though the parking provision onsite is slightly higher than the proposed car parking standards, the onsite layout has been designed to accommodate the operational element of the proposed development, the likely number of staff employed onsite, together with a requirement for visitor parking all within the red-line boundary. For these reasons, it is not considered that the parking associated with the proposed development will overspill onto the surrounding highway network, and negate the need for a TRO to be implemented on the adjacent adopted highway.

4 Site access / Section 278 works

Visibility splays

The LHA consultation response states that:

> *"As a guide it should be noted that any areas which are identified to be within visibility splay envelopes should be dedicated to highways and appropriately hard scaped. Where other treatments are proposed this should be limited to vegetation with a mature growth height of 600mm or constructed features of a maximum of 900mm height".*

This is noted. The visibility splays carried out show that the appropriate visibility can be achieved at the site access junctions based on the appropriate speed of the road. The appropriate visibility splay can be achieved within highway land or land owned by the application. The layout will ensure that the area of land within the visibility splays will be appropriately hard scaped and limited to vegetation with a mature growth height of 600mm or constructed features of a maximum of 900mm height.

Access arrangements for HGV

The LHA consultation response states that:

> *"An alternative layout design should be provided to eliminate the identified issues with HGVs encroaching into oncoming traffic when approaching the HGV delivery service yard access".*

As set out in Chapter 2 of this Technical Note, the swept paths analysis has been updated to show that the layout is capable of accommodating all HGV types, and the proposed layout meets the adoptable standards.

Pedestrian crossing points

The LHA consultation response states that:

> *"the proposed layout for the Heol Y Ddraig access junction includes a zebra crossing on the minor arm, positioned slightly offset from the main road. While the intention to prioritise pedestrians aligns with Welsh Government's hierarchy of road users, the LHA considers its inclusion inappropriate in this instance. The risk of vehicles stopping abruptly within the junction area could lead to obstruction of traffic on the main road. Instead, the crossing should be replaced with an uncontrolled crossing point incorporating dropped kerbs and tactile paving, located along the pedestrian desire line and designed in accordance with the latest guidance."*

The layout has since been updated which includes the removal of the zebra crossing point and the provision of an uncontrolled crossing point incorporating dropped kerbs and tactile paving. The provision of dropped kerbs and tactile paving along the main pedestrian desire lines is shown in Figure 4-1 below and presented in full in Appendix D.

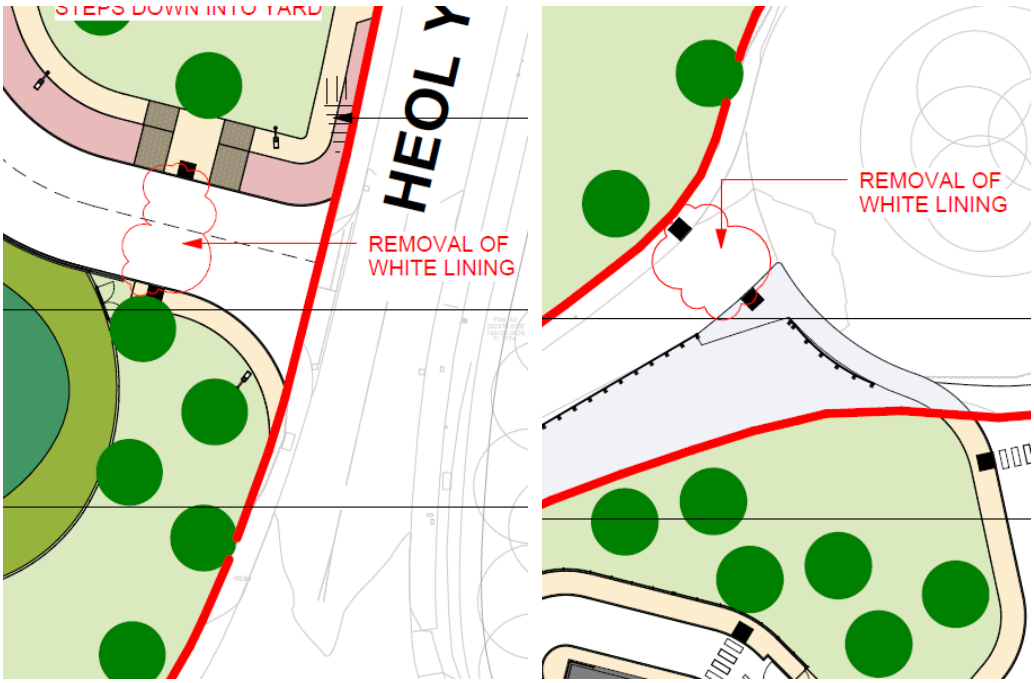


Figure 4-1 Dropped kerbs and tactile paving along the main pedestrian desire lines

The zebra crossing points have been replaced with an uncontrolled crossing point incorporating dropped kerbs and tactile paving, located along the pedestrian desire line and designed in accordance with the latest guidance.

5 Transport Assessment

The LHA consultation response states that:

> *"Taking the additional information into account, the LHA is satisfied that the proposed methodology for assessing operational traffic associated with the distribution fleet has been robustly assessed and appropriately reflects the potential maximum turnover of vehicle trips, inclusive of potential deliveries from HGV, during the two peak house scenarios"*

However, the LHA raised concerns in regards to the information provided in relation to warehouse staff and the associated trip generation that would result from this element, stating that:

> *"The Local Highway Authority has not been provided with any information relating to the number of warehouse staff that would be employed at the site, nor has any assessment made of the vehicle trips that would be generated by this element of the development. In the absence of quantifying staff numbers or shift patterns, there is no robust evidence to prove that warehouse staff arrivals and departures would occur outside of the forecasted network peak hours."*

As part of the planning submission, the supporting technical reports have outlined that the peak operation of the warehouse cannot function unless the warehouse staff are onsite prior to commencement of delivery deliveries arriving at site in the morning peak period. However, the LHA maintains its concern that staff-related trips have not been fully assessed, therefore, a sensitivity test has been modelled to assess a scenario where a change of shift for warehouse staff occurs during the peak highway and site operation hour.

This scenario should be treated as a sensitivity test and is not considered to be a realistic representation of how the site would operate; however, it serves to satisfy the local highway authority in their concerns over a 'what if' scenario. The Sensitivity Test Modelling Report (35251-HYD-XX-XX-RP-TP-8003 Land at Penllergaer Business Park Future Sensitivity Modelling) is presented in full in Appendix E.

As presented in the Sensitivity Test Modelling Report, the peak network hours have been calculated using the base traffic demand within the model study area. This shows the AM peak hour is 0800 to 0900 and the PM peak hour is 1600 to 1700. For the purposes of a robust sensitivity test warehouse staff movements have been included during these peak hours.

The sensitivity test has modelled the arrivals and departures of warehouse staff in the peak hour, with 100 car vehicle arrivals and departures during the AM peak (0800 to 0900) and PM peak (1600 to 1700). These trips have been included in the sensitivity test development demand matrices, and the total trip generation vehicles flows for the purpose of the sensitivity test is presented in Table 5-1 below.

Table 5-1 Proposed development trip generation (sensitivity test)

Time period	Car		LGV		HGV	
	Arrivals	**Departures**	**Arrivals**	**Departures**	**Arrivals**	**Departures**
AM Peak Period						
7am-8am	0	0	216	216	11	11
8am-9am	100	100	216	216	11	11
9am-10am	0	0	216	216	11	11
PM Peak Period						
3pm-4pm	0	0	216	216	11	11
4pm-5pm	100	100	216	216	11	11
5pm-6pm	0	0	216	216	11	11
6pm-7pm	0	0	216	216	11	11

As presented in the Sensitivity Test Modelling Report, the modelling demonstrates that even in the unlikely scenario of warehouse vehicle trips occurring during the peak period of the highway network hour, the development can be mitigated with the proposed highway mitigation scheme. The proposed mitigation is predicted to lead to significant decreases in queueing, delay and journey times which leads to an overall general betterment of the network compared to the Do Minimum scenario.

6 Mitigation measures

A Future Year Modelling Report has been submitted in support of the planning application. The modelling assesses the impact of the development on the highway network for the 2027 opening year and 2037 future year scenarios, considering both AM and PM peak periods.

The modelling report demonstrates that to accommodate the likely impact of the proposed development mitigation measures at the M4 Junctions 47 roundabout are required which would lead to significant improvements on the existing highway network and an overall general betterment of the network compared to the Do Minimum scenario.

The proposed mitigation measures seek to increase capacity at the Penllergaer M4 Junction 47 roundabout by reopening the third lane currently closed to traffic. This would allow lanes 1 and 2 to filter from the A48 westbound toward Gorseinon, with traffic required to perform a zipper merge when exiting the roundabout.

The LHA has raised concern as a similar arrangement was previously implemented at this location, which was subsequently removed due to negative driver feedback, increased driver conflict during merging on the bend, and a rise in reported collisions.

The LHA consultation response states that:

> *"The reliance on reinstating a measure that was previously trialled and proven unsuccessful as the sole mitigation strategy to offset the development's transport impacts raises significant safety concerns".*

Therefore, an alternative arrangement has been presented to the LHA which consists of carriageway widening primarily from the northern side of the A48, with localised widening into the splitter island, to provide a longer merge length and improved taper from the roundabout junction. These Option B mitigation works are shown in Figure 6-1 below, and presented in full in Appendix F.

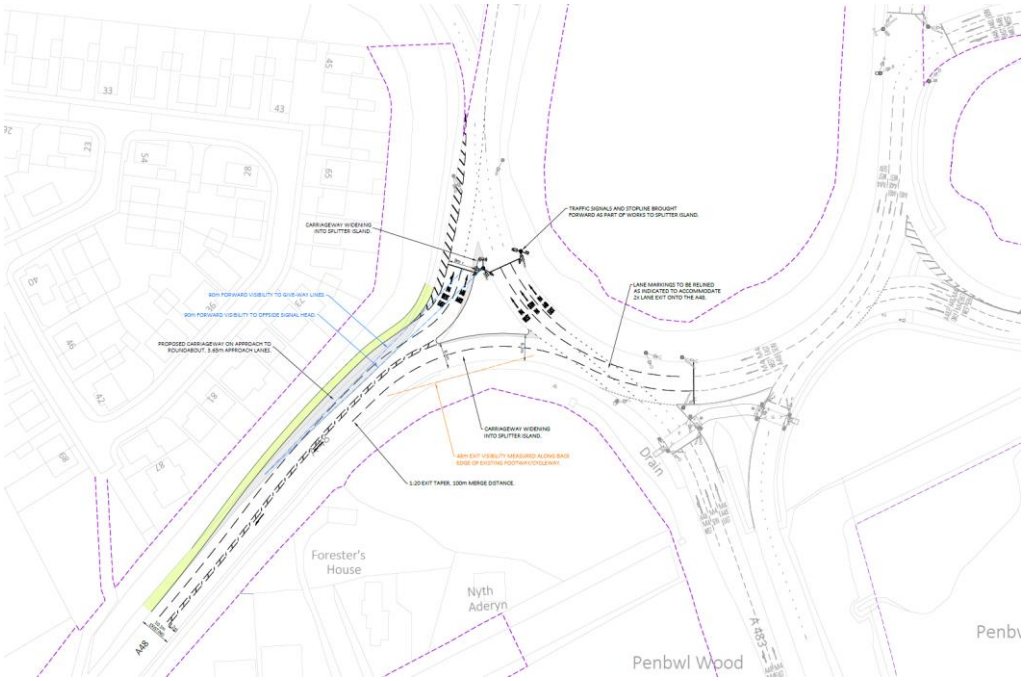


Figure 6-1 Mitigation Measures M4 Junction 47-A48: Option B

This design removes the need for a zipper merge arrangement and provides a sufficient taper length for vehicles to safely exit the roundabout, increasing the merge length where two lanes converge.

The merge length has been designed in accordance with clauses 3.28.6 and 3.28.8 of DMRB CD 116. The exit merge uses a 1:20 taper length, measured after the nosing of the island (where the carriageway width is 8.3m) and extends for 100m (the merge terminates where the lane width is 3.2m).

As requested by the LHA, the proposed mitigation measures have been modified so that:

- The lane widths on the roundabout exit remain consistent at 8.3m throughout the turn
- Hatching is included where the A48 entry and exit meet beyond the triangular island
- The underutilised stop line flare on the A48 has been removed to provide a two-lane approach lane. This consists of a left-turn straight ahead lane (M4 West and M4 East) and ahead only lane (A48/A483).

7 Welsh Government Response

It is noted that the Welsh Government (WG) Transportation Office has reviewed the application and submitted comments to Swansea Council's Planning Department, requesting additional supporting information specifically relating to transportation matters:

> *"1) Quantification of both the existing and proposed queue length on the M4 junction 46 and 47 off slips, during peak periods to determine the impact of the development on the motorway network.*
>
> *2) An update to the Construction Traffic Management Plan (CTMP) to include for the proposed mitigation works to junction 47, identifying proposals to minimise construction impacts on the SRN".*

Queue length on the M4 junction 46 and 47

The development impact on the slip roads of Junction 46 and 47 are presented within Tables 16-19 of the Future Year Modelling Report (35251-HYD-XX-XX-RP-TP-8002.P03) and summarised in Table 7-1.

Table 7-1 Junction 46 and 47 - Mean Queue (vehicles)

	2027 Do Minimum	2027 Do Something	2027 Do Something Mitigation	Difference	2037 Do Minimum	2037 Do Something	2037 Do Something Mitigation	Difference
Junction 46								
AM Peak Period								
M4 east	3.6	5.2	6.5	2.9	2.7	4.2	5.2	2.4
M4 west	0.8	0.9	0.9	0.1	0.8	0.8	0.8	0.1
PM Peak Period								
M4 east	0.7	0.8	0.8	0.2	0.7	0.8	0.8	0.1
M4 west	0.8	0.8	0.8	0.1	0.8	0.8	0.8	0.0
Junction 47								
AM Peak Period								
M4 east	11.5	13.0	2.2	-9.3	30.9	31.0	2.5	-28.4
M4 west	2.5	3.6	3.7	1.2	2.7	4.4	4.5	1.8
PM Peak Period								
M4 east	13.0	15.0	2.3	-10.7	28.1	30.1	2.5	-25.7
M4 west	1.3	1.4	1.6	0.3	1.3	1.4	1.7	0.4

Construction Traffic Management Plan

WG have requested that an update to the CTMP is required to include for the proposed mitigation works to junction 47, identifying proposals to minimise construction impacts on the SRN.

It should be noted that the construction of the proposed mitigation works at J47 would be undertaken as part of a Section 106 agreement, and therefore, the construction of these works would be the responsibility of the LA, not the developer. Therefore, there is no need to update the CTMP to include the construction of the mitigation works.

8 Additional items

8.1 Travel Plan

The LHA consultation response states that an approved first draft of the Travel Plan must be prepared and formally agreed with the LHA prior to any meaningful occupation of the site. It is agreed that this requirement should be secured through an appropriate planning condition as part of any future planning consent.

8.2 Construction Traffic Management Plan

It is acknowledged that the CTMP is classed as a live document and will evolve through the planning process through to and during the construction phase. The LHA consultation response states that Swansea Council can provide a copy of the CTMP guidance, at the appropriate stage, which will be required to be addressed and satisfied prior to the commencement of any construction and more appropriately completed when the contractor is appointed.

It is agreed that this requirement should be secured through an appropriate planning condition as part of any future planning consent. This will include, but not limited to, detailed information regarding onsite plans, key personal qualifications and contact details, pre-commencement highway conditions surveys, confirmation of vehicle routing strategy and construction vehicle trip generation.

Appendix A

LHA Consultation Response

Local Highway Authority planning application consultation response

2025/2027/FUL: Demolition of existing buildings/structures and erection of a single storage and distribution unit (Use Class B8) including ancillary offices (Use Class B1) and associated access, internal roads and paths, parking and van storage, service yard and loading areas, gatehouses and substations, utilities/energy infrastructure, hard and soft landscaping, sustainable drainage infrastructure and earthworks.

Location: Electronic Motion Systems Uk Ltd Penllergaer Business Park Heol Y Ddraig Penllergaer Swansea SA4 9HL
Date: 07/01/2025

Introduction

This document sets out the findings of the Local Highway Authority (LHA) following its review of information submitted by Turley on behalf of the applicant, Stoford Properties Limited, in relation to planning application 2025/2027/FUL. The consultation is informed by a suite of highway-related technical reports and drawings provided by the applicant in support of the full planning application.

The application has been assessed on a site-specific basis and without prejudice. All comments from the LHA are based solely on the documents and information submitted to Swansea Council as part of the planning application process.

Planning History

There is a previous planning history directly related to the above application which is detailed below:

- 2024/1959/PRE For a distribution centre alongside associated parking, outdoor storage and landscaping (Use Class B8). Location: Penllergaer Business Park, Heol Y Ddraig, Penllergaer, Swansea SA4 9HL. Date: 22/01/2025

Highway comments:

In conclusion, the proposed development of the B8 Storage and Distribution Centre at Penllergaer Business Park requires careful consideration of several key factors.

The LHA has highlighted the need for separate access points for operational and staff vehicles to mitigate safety risks, particularly for pedestrians and cyclists. Additionally, the proposed modifications to existing junctions and the introduction of a new arm to the Heol Y Ddraig roundabout must achieve appropriate levels of visibility and safety, as demonstrated through swept path analyses.

The current proposal includes 899 operational spaces and 221 non-operational spaces, but there are discrepancies regarding the inclusion of van loading spaces and the total operational capacity. Additionally, the calculations for staff parking appear to exceed the maximum requirements based on the gross building floor area. The applicant must confirm the basis of these calculations and ensure that

all parking provisions, including cycle and motorcycle spaces, meet the Swansea Council Supplementary Planning Guidance (SPG) Parking Standards.

The applicant must provide information on agreed servicing routes, including a full swept path analysis for the largest expected vehicles. Additionally, the storage and management of waste within the site should be clearly outlined, ensuring that pedestrian and cyclist safety is not compromised.

The trip generation and distribution analysis for the proposed development requires further refinement to ensure accuracy and reliability. The current methodology, which is based on the turnover of van loading spaces, does not fully account for HGV trips or the extensive number of operational spaces. The applicant must provide detailed evidence from similar sites to substantiate the proposed trip generation figures.

Additionally, the use of 2011 census data for employment trips needs to be supported with robust contextual information to accurately reflect the vehicle demand generated by the workforce. The analysis should also consider multiple peak operational hours and their potential impact on the network.

Recent highway improvements need to be considered with the need to provide new traffic turning count surveys to reflect current driver behaviours. Additionally, the inclusion of committed development sites in the wider area is to be included in the analysis.

The LHA agrees to the seven sites listed for analysis and has requested the inclusion of two additional junctions along the A48. The applicant must ensure that the impact of increased through traffic on these junctions is accurately assessed.

The Highway Authority is prepared to continue dialogue and discussion on the above, informing the necessary assessments, should the application proposals proceed.

- Pre-Application Consultation (PAC)

The applicant carried out a Pre-Application Consultation (PAC) for the proposed development, to which the Local Highway Authority (LHA) provided comments in 2025. These comments have been documented by the applicant within the PAC report accompanying this application. A summary of the LHA's PAC response is as follows:

The LHA has conducted a comprehensive review of the PAC materials submitted by Stoford Properties Limited for the proposed Storage and Distribution Facility at Penllergaer Business Park, Swansea.

While the PAC submission demonstrates a proactive approach to addressing many of highway related matters, several areas require further clarification and revision to ensure the development is compliant with planning policy. Key issues include:

- *Swept Path Analysis: Incomplete or undersized vehicle assessments, particularly for refuse and articulated vehicles, and concerns over clearance and encroachment.*
- *Car Park Design: Need for compliance with SPG standards and improved pedestrian safety measures.*
- *Site Access and Section 278 Works: Junction designs and visibility splays require refinement to meet highway standards and avoid operational conflicts.*

- *Transport Assessment: Trip generation figures remain incomplete, lacking consideration of staff and fleet driver movements.*
- *Modelling Report: Simulation outputs show vehicles waiting outside the network, suggesting extended peak hour conditions. These implications must be clarified. Missing appendices and ATC survey data must be included in future submissions. The LHA also requests clearer presentation of journey time routes to aid interpretation.*
- *Road Safety Audit: The RSA must extend beyond internal site observations to consider integration with the wider highway network, particularly the A48 corridor. The proposed merge movement is not supported due to safety concerns, but alternative layouts may be considered if they avoid downstream merging and improve usability.*
- *Connectivity and Travel Planning: The site's reliance on private vehicles must be addressed through improved public transport and active travel infrastructure.*
- *Construction Traffic Management: Forecasts appear underestimated; more detailed planning and routing strategies are needed.*

The LHA encourages the applicant to incorporate the feedback provided into the final planning application to ensure a comprehensive assessment of the development which can be supported from a Highways and transportation perspective. The LHA remains committed to ongoing engagement with the applicant during the planning process to resolve any outstanding issues.

Swept Path Analysis

The latest LHA comments provided during the PAC consultation identified issues with the previous swept path analysis that required amendments to the submission. These amendments included:

- Inclusion of a 11.20m Pheonix refuse vehicle.
- Additional tracking for a Fire Tender of the van loading areas.
- Inclusion of a 5.92m Mercedez Sprinter Panel Van
- Inclusion of a 18m articulated vehicle.

This latest application now includes the necessary swept path analysis for the vehicles set out above, with the tracking mostly confirming the internal layout has the capability to accommodate each type of vehicle anticipated to be operating on site in the context of the intended site operations.

A review of the 18m articulated vehicle tracking indicates that a larger HGV cannot access the distribution warehouse loading bay without significant encroachment into adjacent carriageways on two occasions. First, both the wheel and body paths cross the junction centre line when entering the Heol Y Ddraig access junction. Second, the wheel and body tracking again cross the carriageway centre line as the vehicle approaches the loading bay access gate. This is particularly concerning as the proposed access road is intended to be shared with general warehouse staff and site visitors for parking. Such encroachment by larger HGVs could create operational conflicts and increase safety risks for anyone leaving the general car park when warehouse deliveries are undertaken.

It is noted that the Heol Y Ddraig access, while currently an existing junction, will be subject to alterations under the application proposals as part of a Section 278 agreement. Given that

these changes already include modifications to the junction and internal layout, there is no obvious reason why the design should not accommodate this type of vehicle without the documented encroachment. It is therefore recommended that the proposed layout be amended to reflect this requirement. Moreover, providing a layout capable of accommodating all HGV types at this stage will help expedite approvals once engagement with Network Management commences for the Section 278 approval process. With the first encroachment occurring on adopted highway, the current swept path analysis would not be regarded as meeting adoptable standards.

Parking

Car parking provision for the development is divided into two distinct categories: Staff/Visitor Parking and Operational Parking. Each category is located separately within the site. Staff and visitor parking is located to the north, whilst operational parking is located to the south and west of the warehouse building. The proposed parking allocation for each is as follows:

- Operational spaces: 899
- Non-operational (staff/visitors) spaces: 221, including 12 accessibility spaces
- Motorcycle spaces: 23
- Cycle spaces: 32

It is noted that the proposed quantity of parking for both operational and non-operational uses represent a significant increase compared to the existing site allocation. This increase is understandable given the change of use proposed within the application.

Considering the SPG parking standards guidance, the overall quantum of operational parking does not comply with current requirements. In particular, the calculation for staff parking based on gross floor area indicates that the provision of 221 spaces exceeds the maximum permitted under SPG. Furthermore, the applicant has not provided clarification on the methodology used to justify this departure from policy.

In terms of design and layout, the car parks are intended for private use and falls outside the adopted highway boundary. Responsibility for management will remain with the site operator. It is also noted that the dimensions of the proposed spaces do not meet SPG design guidance, an issue previously raised during the PAC stage.

To mitigate the risk of staff overspill parking on the adjacent adopted highway, should on-site provision prove insufficient, a Section 106 contribution will be required from the developer. This contribution will fund the implementation of a Traffic Regulation Order (TRO) along the site approach road, introducing parking restrictions to prevent staff vehicles from parking on the adjacent adopted highway.

The applicant has provided some context on the intended operation of the site’s parking arrangements within a supplementary Vehicle Movement Summary. While this document offers partial justification for the proposed quantum of operational parking, it does not disclose the anticipated fleet size. The rationale for the number of spaces primarily relates to the need to store fleet vehicles on-site overnight, as drivers are not allocated dedicated vehicles for

home use. Instead, drivers are expected to travel to the site by their own means, collect a delivery vehicle for their rounds, and return it to the site upon completion before departing via their original mode of transport.

Additionally, the applicant states that the 899 operational storage bays are essential to meet the requirements of the proposed distribution centre and are consistent with similar facilities nationwide. However, the Local Highway Authority (LHA) notes that no comparative evidence has been provided to substantiate this claim.

On review, the proposed development does not comply with Swansea Council's SPG in respect of parking provision. It is evident that the applicant has adopted a first-principles approach to determine the amount of parking required for the development to operate effectively from their perspective. However, the application fails to provide the necessary supporting evidence to justify this approach.

In the absence of robust justification and comparative data, the LHA currently considers the parking strategy presented within the application to be inconsistent with adopted planning policy and therefore non-compliant with SPG requirements.

Site access / Section 278 works

All works on the existing highway are subject to an agreement under section 278 of the Highways Act 1980. All designs and implementations will be at the expense of the developer.

Under the section 278 agreement the developer will be expected to work alongside the LHA's Development Control department and provide a detailed design for all the site access junction alterations that is complaint with existing highway design specifications.

Appendix E contains plans which set out some visibility splays for junctions, that would serve the development. These should be comprehensive setting out the overall requirements as per the appropriate standards and visibility should be clearly demonstrated. For example, on the Heol Y Ddriag junction, one the splays is such that it passes over areas which would be subject to landscaping treatment, however there is no corresponding key from which to determine what this would be. As a guide it should be noted that any areas which are identified to be within visibility splay envelopes should be dedicated to highways and appropriately hard scaped. Where other treatments are proposed this should be limited to vegetation with a mature growth height of 600mm or constructed features of a maximum of 900mm height.

Although the internal layout is not considered part of the adoptable highway, previous LHA comments regarding swept path analysis must be addressed. An alternative layout design should be provided to eliminate the identified issues with HGVs encroaching into oncoming traffic when approaching the HGV delivery service yard access.

The proposed layout for the Heol Y Ddraig access junction includes a zebra crossing on the minor arm, positioned slightly offset from the main road. While the intention to prioritise pedestrians aligns with Welsh Government's hierarchy of road users, the LHA considers its inclusion inappropriate in this instance. The risk of vehicles stopping abruptly within the junction area could lead to obstruction of traffic on the main road. Instead, the crossing should

be replaced with an uncontrolled crossing point incorporating dropped kerbs and tactile paving, located along the pedestrian desire line and designed in accordance with the latest guidance.

Transport Assessment

A Transport Assessment (TA) has been submitted as part of the application. This document is unchanged from that considered during the previous LHA consultation. The LHA's comments provided in response to the TA at the PAC stage were as follows:

"This report aims to outline the anticipated impact of the proposed development on the surrounding highway network upon completion. To accurately assess this impact, it is essential to establish the expected volume of traffic generated by the development, based on robust trip generation forecasts.

"Since the pre-app consultation the TA has taken steps to address concerns previously raised by the LHA. These include further context on how the site will operate. Namely that the distribution centre fleet will be stored on site, with drivers expected to utilise private or public transport to arrive at their place of work. Additionally, an employment density analysis has been included for the warehouse operations staff to estimate expected staffing levels. Lastly, an estimation of HGV deliveries anticipated during peak hours is provided.

"While the inclusion of this supplementary information is acknowledged, the LHA maintains that the estimated trip generation presented remains inaccurate. Table 6-1 below summarises the two-way trips estimated in the TA.

Table 6-1 Operational trip generation during any hour

Time	No. of arrivals		No. of departures		Total no. of trips
	Cars/lights	HGVs	Cars/lights	HGVs	
AM peak	216	11	216	11	454
PM peak	216	11	216	11	454

"The trip generation values presented are based on an assumed turnover rate of the 72 van loading bays, along with the inclusion of 11 HGV deliveries during the peak hour. Representing the maximum operational capacity of the loading area. The LHA broadly supports these figures as a reasonable reflection of the distribution centre's core operations.

"However, the assessment does not account for two critical components of the site's overall trip generation potential:

1. *Warehouse staff and visitors present on-site during peak hours, including the modes of transport used to access the site.*
2. *Fleet drivers accessing the site to begin their delivery routes, who must enter the site to collect a fleet vehicle and park their private vehicle on-site.*

"These additional sources of trip generation must be incorporated into the overall assessment and reflected within the Aimsun transport modelling process to ensure a comprehensive and accurate evaluation of the development's impact.

“As these elements have not been included in the Transport Assessment to date, the Local Highway Authority (LHA) is currently unable to consider the resulting outputs as an accurate representation of the development’s true impact on the wider highway network.”

A response to these LHA observations was provided by the applicant within the subsequent PAC report. Along with a Vehicle Movement Summary to assist in assessing the bespoke nature of the site’s operations and to explain how the intended end user is expected to operate the a last-mile distribution centre of this type.

Taking the additional information into account, the LHA is satisfied that the proposed methodology for assessing operational traffic associated with the distribution fleet has been robustly assessed and appropriately reflects the potential maximum turnover of vehicle trips, inclusive of potential deliveries from HGV, during the two peak house scenarios.

However, the Local Highway Authority continues to have concerns regarding the information provided in relation to warehouse staff and the associated trip generation that would result from this element.

The explanation provided within the PAC report sets out that:

“w*arehouse operatives are on different shift patterns to the Fleet drivers, who need to arrive and depart outside of the peak periods to ensure maximum operational efficiency. Parcels need to be ready for delivery before the LGVs drivers arrive at site, therefore, any staff associated with the warehouse would have to arrive and depart site outside of the peak periods. This strategy ensures the distribution centre achieves the maximum turn-over of 72 loading bays three times an hour.”*

Notwithstanding the above explanation, the Local Highway Authority has not been provided with any information relating to the number of warehouse staff that would be employed at the site, nor has any assessment made of the vehicle trips that would be generated by this element of the development. In the absence of quantifying staff numbers or shift patterns, there is no robust evidence to prove that warehouse staff arrivals and departures would occur outside of the forecasted network peak hours.

In the absence of this information, the potential for overlap between warehouse staff movements and modelled peak-hour traffic conditions cannot be ruled out. As such, the TA does not currently provide a complete representation of the site’s overall trip generation, particularly in relation to staff movements.

The LHA therefore maintains its concern that staff-related trips have not been fully assessed, which could materially affect the accuracy of the modelling outputs and the conclusions drawn regarding the development’s impact on the wider highway network.

With the exception of the outstanding concerns relating to the quantification of warehouse staff numbers and associated trip generation, the remainder of the Transport Assessment is considered to have been prepared in accordance with Welsh Government Transport Analysis Guidance (TAG), and in line with the modelling scoping specifications previously agreed between the LHA and the applicant. The assessment methodology, modelling approach, and

consideration of committed development and wider network impacts are generally acceptable. However, until staff-related trip generation is adequately quantified and assessed, the Transport Assessment does not provide a complete representation of the development's transport impact, and its conclusions cannot be fully relied upon.

Modelling Report / Traffic Impacts

A Future Year Modelling Report is submitted in support of the application. The modelling assesses the impact of the development on the highway network for the 2027 opening year and 2037 future year scenarios, considering both AM and PM peak periods.

The modelling results indicate that the introduction of the development will negatively affect overall network performance across all assessed metrics.

In the 2027 opening year scenario, the AM peak period shows an increase in average delay of approximately **+7.6 seconds per kilometre**, while the PM peak experiences a more pronounced increase of **+15.9 seconds per kilometre**.

Mean queue lengths also rise significantly, with an increase of **+42.5 vehicles in the AM peak and +89 vehicles in the PM peak**, representing a deterioration of network conditions.

Average speeds decline by up to **-3.4 km/h**, and stop times increase by over **80%** during the PM peak, highlighting the greater sensitivity of the evening period to additional traffic demand.

By 2037, the impacts become more severe, particularly during the PM peak. Delay increases by **+24.9 seconds per kilometre**, and mean queues surge by **+182.6 vehicles**, indicating substantial congestion and suppressed demand.

The modelling also identifies a significant rise in vehicles waiting to enter the network at the end of the simulation period, with **227 vehicles queued outside the network during the PM peak**, suggesting that normal rush-hour conditions will be extended as traffic is unable to enter the network within the modelled timeframe.

Journey time analysis reinforces these findings. In the AM peak, routes 02-A (A4240 Gorseinon Road to M4 eastbound via the A48 corridor) and 03-A (A483 to M4 eastbound via the M4) demonstrate increases well above the 15% threshold, with changes of **+24.7% and +17%** respectively.

The PM peak shows the most severe impacts, particularly on Route 02-B (M4 eastbound to A4240 Gorseinon Road via the A48 corridor) where journey times increase by **+101% in 2027 and +120% in 2037**, reflecting critical delays for traffic attempting to egress from the A48 onto the M4 Junction 47 interchange. Other routes also experience notable increases.

Overall, the modelling, without any mitigation, demonstrates that the proposed development will significantly intensify congestion on the highway network, particularly during the PM peak and in the 2037 forecast year. These impacts are concentrated on key corridors such as the A48 and M4 junction approaches, where journey times and queuing are forecast to rise

sharply, leading to extended peak periods and reduced network resilience. The application has summarised similar findings in the TA as follows:

"There are noticeable issues with vehicles waiting to enter in both peak periods with the development in place (366 and 227 vehicles). These results suggest that the development gives rise to noticeable impacts on the wider highway network which are likely to require mitigation."

"In the 2037 scenario it is shown that the development flows give rise to severe impacts on the highway network, in particular on Route 2B where the A48 traffic struggles to egress onto Junction 47 interchange."

The modelling report demonstrates that the proposed development is not viable without the introduction of mitigation measures, specifically at the M4 Junctions 47 roundabout, to counteract the traffic impacts associated with introducing the additional vehicle trips generated by the scheme into the highway network. Without such measures, the modelling forecasts significant deterioration in network performance.

Mitigation measures

The proposed mitigation seeks to increase capacity at the Penllergaer M4 Junction 47 roundabout by reopening the third lane currently closed to traffic. This would allow lanes 1 and 2 to filter from the A48 westbound toward Gorseinon, with traffic required to perform a zipper merge when exiting the roundabout.

A Stage 1 Road Safety Audit (RSA) has been undertaken and highlights several issues with the proposed arrangement. The primary concern relates to the adequacy of the merge point following exit from the roundabout. The RSA states:

"There is a risk of side-swipe and rear-end shunt collisions on the exit leg of the roundabout due to an insufficient merge length where two lanes converge. Vehicles merging over a short distance without clear lane dominance or adequate decision-making time are more likely to experience conflict, increasing the risk of sudden deceleration and rear-end shunts. Additionally, two-wheeled vehicles face heightened danger from abrupt lane changes or merging traffic, particularly during peak hours or adverse conditions."

It is important to note that a similar arrangement was previously implemented at this location, as evidenced by residual merge markings on the A48. This design was subsequently removed due to negative driver feedback, increased driver conflict during merging on the bend, and a rise in reported collisions. Therefore it was removed based on highway safety grounds.

The reliance on reinstating a measure that was previously trialled and proven unsuccessful as the sole mitigation strategy to offset the development's transport impacts raises significant safety concerns. Throughout the planning process, the Local Highway Authority (LHA) has consistently maintained that a merge exit from the

roundabout will not be supported for the reasons outlined above. This position remains unchanged.

Consequently, the LHA cannot endorse the modelling results that incorporate this mitigation measure, given the associated risk to highway performance, as identified in the TS, if the zipper merge arrangement is introduced and subsequently needs to be removed due to recurring safety issues.

Road Safety Audit & Wider Connectivity Considerations

The existing Road Safety Audit (RSA) has identified several site-specific safety concerns, including restricted visibility at the site access roundabout and the use of informal crossing points within the development boundary. These issues must be addressed through revisions to the site layout to ensure safe and efficient movement for all users, particularly vulnerable road users.

The application now includes an Active Travel Audit covering both the immediate site access and the two primary routes serving the site from the west and east. This audit maps existing active travel routes, identifies gaps in connectivity, and informs the design of new infrastructure to support safe and direct access to the site.

Appendix B of the Transport Statement illustrates that the site is currently accessible from either direction via a series of uncontrolled pedestrian crossings and paved footways, offering continuous connections to the A48. While this review is considered suitable for assessing existing connectivity, it does not account for the intended land use and the associated increase in motorised traffic once the site becomes operational. The application itself anticipates an increase of approximately 450 vehicle trips per hour, comprising HGVs, panel vans, and private cars.

Given the site's relatively isolated position on the highway network and its operational nature, combined with the anticipated traffic intensification, the development is predominantly geared toward private vehicle access. This highlights the need for the developer to contribute toward the delivery of supporting infrastructure, which may include:

- A48 Crossing Improvements – The introduction of pedestrian crossings to TOUCAN standard to support both pedestrian and cycle movements.
- Improved dropped crossing facilities at the main A48 site access roundabout, where pedestrian infrastructure is currently limited or absent.
- Public Transport Enhancements - The existing No. 46 bus service that stops along the A48 is insufficient in frequency and coverage to support the development. A revised or new bus service is considered necessary to provide meaningful connectivity to the wider Penllergaer area.
- The enhancement or introduction of new bus stop within acceptable walking distance of the site, including new shelters, real-time passenger information displays (RTPI), Accessible kerbing and footways.
- Traffic Regulation Orders and Directional Signage to manage traffic flow and improve safety.

Without these interventions, the site risks remaining heavily car-dependent, limiting its accessibility and long-term viability to support sustainable modes of travel. These measures are considered essential to ensure compliance with current planning policy.

The anticipated cost for each intervention listed above must be robustly quantified through consultation with relevant stakeholders and incorporated into a Section 106 agreement as part of the planning application process.

Travel Plan

The Travel Plan (TP) included with the application provides an initial overview of the existing highway network conditions surrounding the site. supplemented by an Active Travel Audit of the primary access routes. Together, these documents offer a useful summary of current conditions.

However, the TP references several bus stops within the wider Penllergaer area that, while indicative of existing facilities, are not considered viable for accessing the development due to their distance from the site. Consequently, the LHA identifies bus connectivity as a significant barrier to public transport access.

Service 46, the only bus route stopping directly outside the development, operates at a limited frequency and does not support the proposed 24/7 operational nature of the site. Service X13 provides some regional connectivity but suffers from similar limitations, as its scheduled stops are not directly linked to the development.

A complete TP is expected to provide a robust estimate of the number of trips the development will generate, covering both peak and off-peak periods and accounting for all modes of transport. While the TRICS database is commonly used for trip generation based on comparable developments, the applicant has opted for a first-principles approach. For employment-based developments, trip generation can be reliably calculated using operational details such as anticipated staff numbers, working hours, and shift patterns. To date, this information has not been provided. Alternatively, comparable data from the end user's existing distribution centres could inform the assessment.

In addition, the TP should include a breakdown of modal share, categorising trips by mode (walking, cycling, public transport, private car). This baseline is essential for future monitoring of modal shift. At present, the TP does not provide meaningful data on modal share or anticipated staffing levels, both of which are critical for understanding the site's transport demand.

Moreover, it is acknowledged that the TP will operate as a live document from occupation of the site. Accordingly, an approved first draft of the TP must be prepared and formally agreed with the LHA prior to any meaningful occupation of the site. This requirement should be secured through an appropriate planning condition as part of any future planning consent.

Construction Traffic Management Plan

The applicant has prepared a Construction Traffic Management Plan (CTMP), and this has been reviewed are part of the application response.

A CTMP is classed as a live document and will evolve through the planning process through to and during the construction phase. The CTMP prepared and audited through the planning application process will contain the main principles of how the traffic impacts of construction will be managed, through the use of a planning condition this will ensure that the CTMP is adopted and updated accordingly by the primary contractor.

The CTMP in its current form contains the typical range and type of information that would be required. The 'Construction Trip Generation' section advised that the construction programme has not been finalised and therefore the TRICs database has been used to estimate construction traffic. This has been suggested as 30 construction vehicle arrivals and 30 departures per day. This would appear to be low, based on experience of large-scale schemes. In any event the construction traffic impact should be informed by the engineer and designers forecast by construction activity identifying the peak period of activity and setting out construction traffic in the format of HGVs, Plant and LGVs associated with construction workers.

The CTMP confirms that all construction traffic parking, deliveries and material holding will take place on site. As part of the application or discharge of planning conditions it would be required that plans are set out showing the full compound areas and intended uses. The site would be subject to swept path analysis which detail entry into the site, circulation and turning, holding points and egress. The CTMP must set out appropriate measures which ensure that no waiting takes place on the highway, this would include appropriate illustration of internal stacking room and gate management which accommodates the largest expected vehicle between any security gate and the highway.

The general strategy for the routing of construction traffic has been set out and in general it is logical and appropriate works to contain construction traffic to the strategic road network and appropriate classified routes, where possible. There is a concern over the use of Junction 47 and that Junction 46 may instead be a more appropriate approach in terms of the sensitivity of the junctions. The applicant could either restrict vehicle access and egress from that junction of the motorway network or provide more detailed information on the daily profile of construction traffic, distribution onto the network and forecast of peak hour traffic impacts on the junctions, in order that impact could be considered further.

Swansea Council can provide a copy of the CTMP guidance, at the appropriate stage, this will be required to be addressed and satisfied prior to the commencement of any construction and more appropriately completed when the contractor is appointed. This will include more detailed information such as, but not limited to, detailed plans, Chapter 8 proposals, key personal qualifications and contact details, liability insurance details pre-commencement highway conditions surveys.

Welsh Government Response

It is noted that the Welsh Government (WG) Transportation Office has reviewed the application and submitted comments to Swansea Council's Planning Department, requesting additional supporting information specifically relating to transportation matters:

"I refer to your consultation of 12th November 2025 regarding the above application. The Welsh Government as highway authority for the Strategic Road Network (SRN) directs that planning permission is not granted at this time as the applicant has provided insufficient information to determine the application.

"The applicant must provide the following information to support this application or resubmit the application with the following details;

1) *Quantification of both the existing and proposed queue length on the M4 junction 46 and 47 off slips, during peak periods to determine the impact of the development on the motorway network.*

2) *The Transport Assessment (TA) uploaded to the planning portal is missing the associated appendices. The applicant will be required to supply, or signpost their locations, if they have been previously submitted.*

3) *An update to the Construction Traffic Management Plan (CTMP) to include for the proposed mitigation works to junction 47, identifying proposals to minimise construction impacts on the SRN.*

General Notes

1) *The TA is being provided to our Transport Planning consultant to undertake an independent review to confirm methodologies, conclusions, and proposed mitigation are appropriate for the scale of the development. It shall be further noted the applicant response to holding direction one and two above will be provided when received.*

2) *Proposals shall include due consideration of current Acts including the Active Travel Act, the Equalities Act as well as seek to meet objectives of the Wales Transport Strategy to maximise local accessibility and minimise private vehicular trip generation."*

As the Welsh Government (WG) is responsible for the Strategic Road Network (SRN) in Wales and given the site's proximity to two M4 interchange junctions, WG understandably maintains a strong interest in ensuring the application accurately assesses the development's impact on both the local and wider SRN.

WG has therefore requested additional information and clarification from the applicant on several key issues. It is strongly recommended that the applicant engages directly with WG officers to provide the necessary details. Until these matters are resolved, Swansea Council's Planning Department will be unable to issue a determination on the application.

Conclusion

The Local Highway Authority has undertaken a detailed and comprehensive review of planning application 2025/2027/FUL. While progress has been made since the pre-application and PAC stages, significant and Highway concerns remain unresolved.

The proposed development, in its current form, does not demonstrate compliance with Swansea Council's adopted parking standards. The applicant has failed to provide sufficient justification to support a departure from the SPG in relation to the level of operational and staff parking proposed.

The swept path analysis highlights unacceptable levels of HGV encroachment onto both adopted highway and internal shared access routes, which presents a material safety concern for all users and fails to meet adoptable highway standards.

The Transport Assessment and associated modelling identify substantial adverse impacts on the surrounding highway network. Without mitigation the modelling indicates extended peak conditions, excessive queuing and suppressed demand. Importantly, the assessment does not robustly quantify warehouse staff numbers or adequately assess staff-related trip generation, resulting in an incomplete representation of the development's full transport impact.

The mitigation measures proposed, centred on reinstating a multi-lane merge arrangement at M4 Junction 47, raises Highway safety concerns and is not supported by the Local Highway Authority in its present form. As such, the modelling outputs that rely upon this mitigation cannot be supported.

All works on the existing highway are subject to an agreement under section 278 of the Highways Act 1980. All designs and implementations will be at the expense of the developer. Under the section 278 agreement the developer will be expected to work alongside the LHA's Development Control department and provide a detailed design for all the site access junction alterations that is complaint with existing highway design specifications.

In addition, the development remains heavily car-dependent, with insufficient public transport provision and limited active travel infrastructure relative to the scale and intensity of the proposed use. While the Active Travel Audit and Travel Plan provide a baseline understanding of existing conditions, they do not currently offer a credible alternative for reducing the reliance on private vehicles. Investment in pedestrian, cycle and public transport infrastructure would be required, secured through an appropriate Section 106 agreement.

No development shall be occupied until a full Travel Plan has been submitted to and approved in writing by the Local Highway Authority. The approved Travel Plan shall be implemented upon first occupation and monitored in accordance with the agreed schedule.

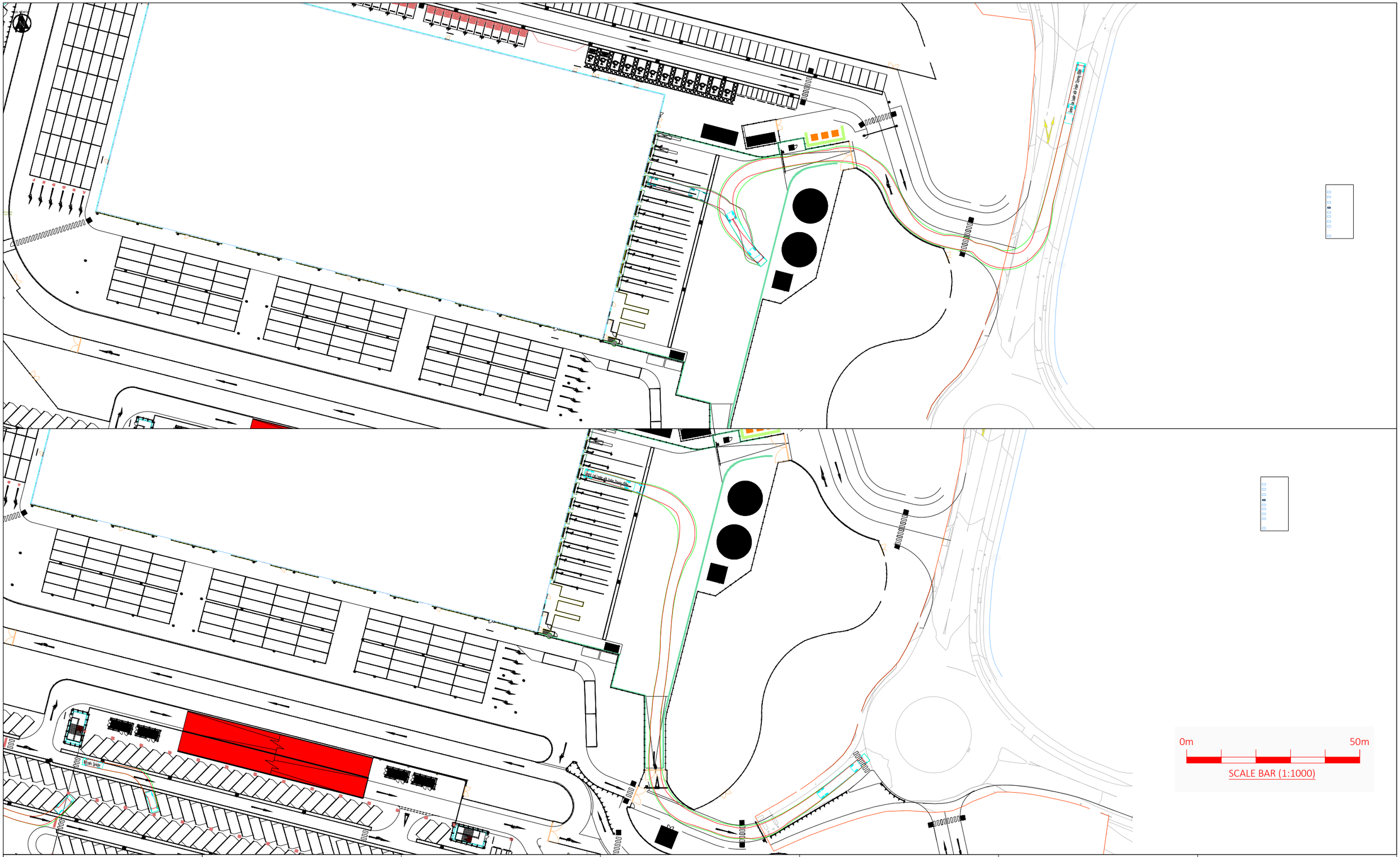
The Welsh Government, as highway authority for the Strategic Road Network, has also raised concerns and issued a holding direction pending the submission of additional transport information. Until these matters are addressed to the satisfaction of both the Local Highway

Authority and Welsh Government, Swansea Council is unable to determine that the development would operate safely or sustainably in highway and transportation terms.

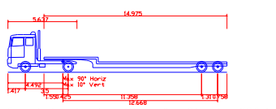
This planning application has been considered on a case-specific basis, and the Local Highway Authority recommends that the application be refused on highway safety grounds. In the absence of further supportive information, revised access layouts and an alternative mitigation strategy, the proposal would result in unacceptable highway safety impacts due to the unresolved issues outlined above.

Appendix B

Swept path analysis: 18m articulated vehicle at the Heol Y Ddraig access junction



KEY PLAN



NOTES

NOTES *(CONTINUED)*

REVISIONS *(CONTINUED)*

REVISIONS

Rev	Date	Description	By	Ckd	App
P02	20/01/26	After comments.	LR	EC	EC
P01	14/08/25	First Issue.	LR	EC	EC

Stantec
Third Floor, Wharton Place
13 Wharton Street
Cardiff
CF10 1GS
t: +44(0)2920 023665
e: cardiff@hydrock.com

CLIENT
STOFFORD PROPERTIES LTD

PROJECT
DISTRIBUTION CENTRE, BUSINESS PARK PENLLEGAER

TITLE
SWEPT PATH ANALYSIS

18M ARTICULATED VEHICLE

HYDROCK PROJECT NO.	SCALE @ A3
35251	1:1000

STATUS DESCRIPTION	STATUS
INFORMATION	S2

DRAWING NO. (PROJECT CODE-ORGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER)	REVISION
35251-HYD-XX-XX-DR-TP-0109	P02

Appendix C

Vehicle Movement Strategy

Stantec

Penllergaer Business Park: Vehicle Movement Summary

Context

Stantec Ltd are supporting a planning application for the redevelopment of Mechatronics Systems Wales Ltd to provide a Distribution Centre on land at Penllergaer Business Park.

The building is designed as a ‘last mile’ facility, processing and sorting goods from higher up the supply chain, which are then loaded into vans to be delivered directly to customers.

This report provides a summary of the proposed vehicle movements as part of the development proposals, which is set out in full in the supporting Transport Assessment (35251-HYD-XX-XX-RP-TP-5000-P08).

Development Proposals

The operations of the last mile facility are summarised below:

- Goods are delivered to the site by HGVs for sorting, typically overnight
- Staff working in the building unload these goods, process and sort them, so they are ready to be loaded into vans
- These parcels will be delivered to customers' homes, which will generally occur throughout a typical working day
- The processing and sorting of goods within the building therefore have to be completed well in advance of the first vans of the day arriving to the loading area and departing the site at the start of the typical network peak period

Development Proposals continued …

- The Transport Assessment has modelled and tested maximum traffic movements within the peak hours to ensure the data is robust
- Delivery drivers will arrive at site at the start of the typical network peak period via their chosen method of transport and pick up an allocated delivery vehicle which is stored on site
- Delivery drivers will be allocated with a specific time slot to arrive onsite which will coordinate with the maximum turnover of 72 delivery employees arriving and 72 delivery vehicles leaving the site over a 20-minute period (maximum capacity for 216 vehicles arriving and 216 departing)
- This will ensure that all delivery drivers do not arrive onsite at the same time to maximise the efficiency of the onsite operations
- The sorting and processing of parcels within the warehouse would need to happen in advance of delivery drivers arriving at site to ensure the parcels are ready for delivery
- It is essential that the arrival of staff sorting the parcels and delivery drivers are sequential to ensure efficient operation

Vehicle Movements

PENLLERGAER BUSINESS PARK

72 van waiting bays
Vans waiting before being loaded

221 parking spaces
Warehouse staff and visitors

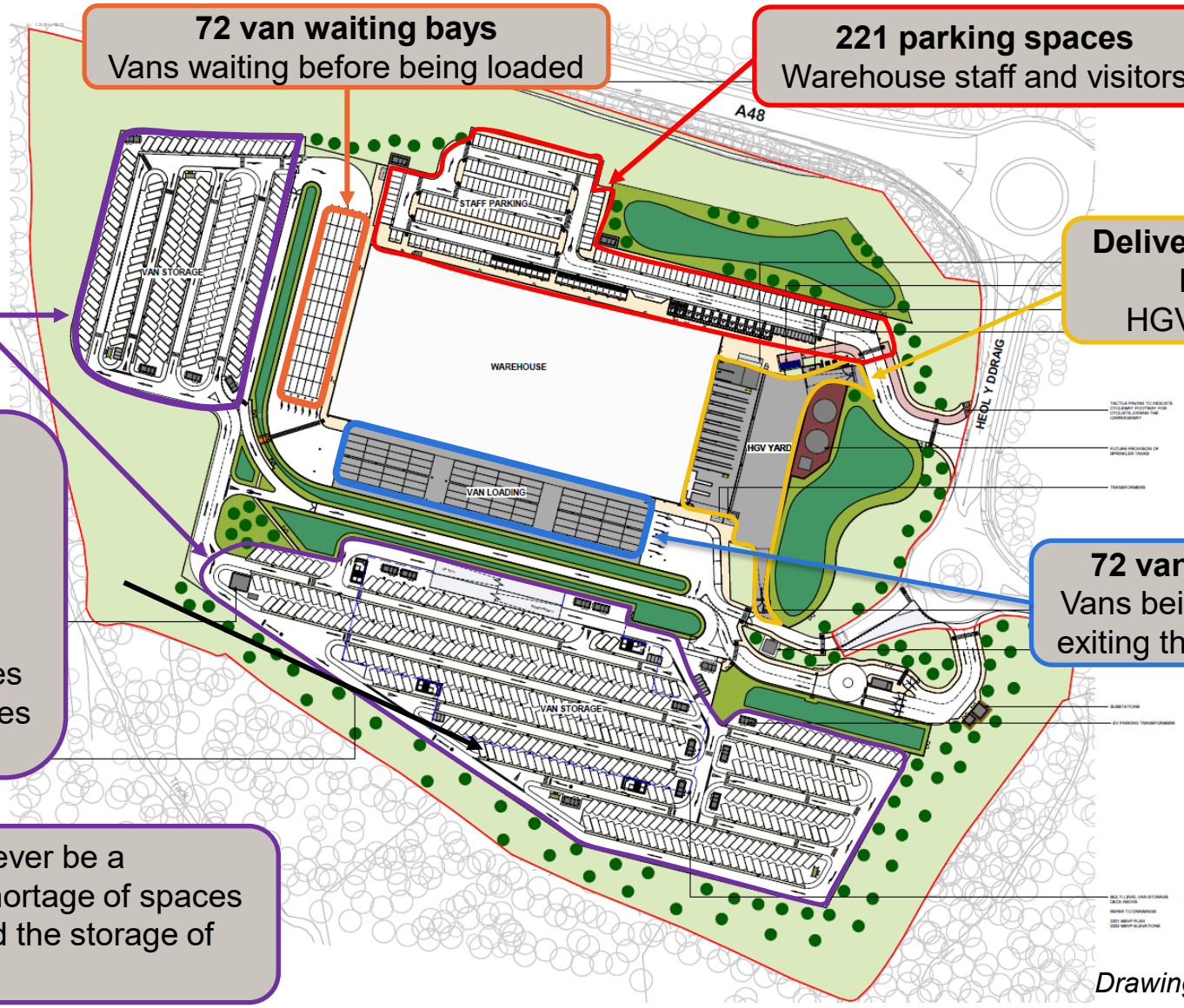
Delivery and servicing yard
Refuse collection
HGV and LGV deliveries

Operational storage

- Accommodates any van drivers who drive to the site to leave their personal vehicle in a vacated storage bay
- Houses van fleet vehicles when not out on deliveries

On this basis there would never be a situation where there is a shortage of spaces for drivers' own vehicles and the storage of fleet vehicles

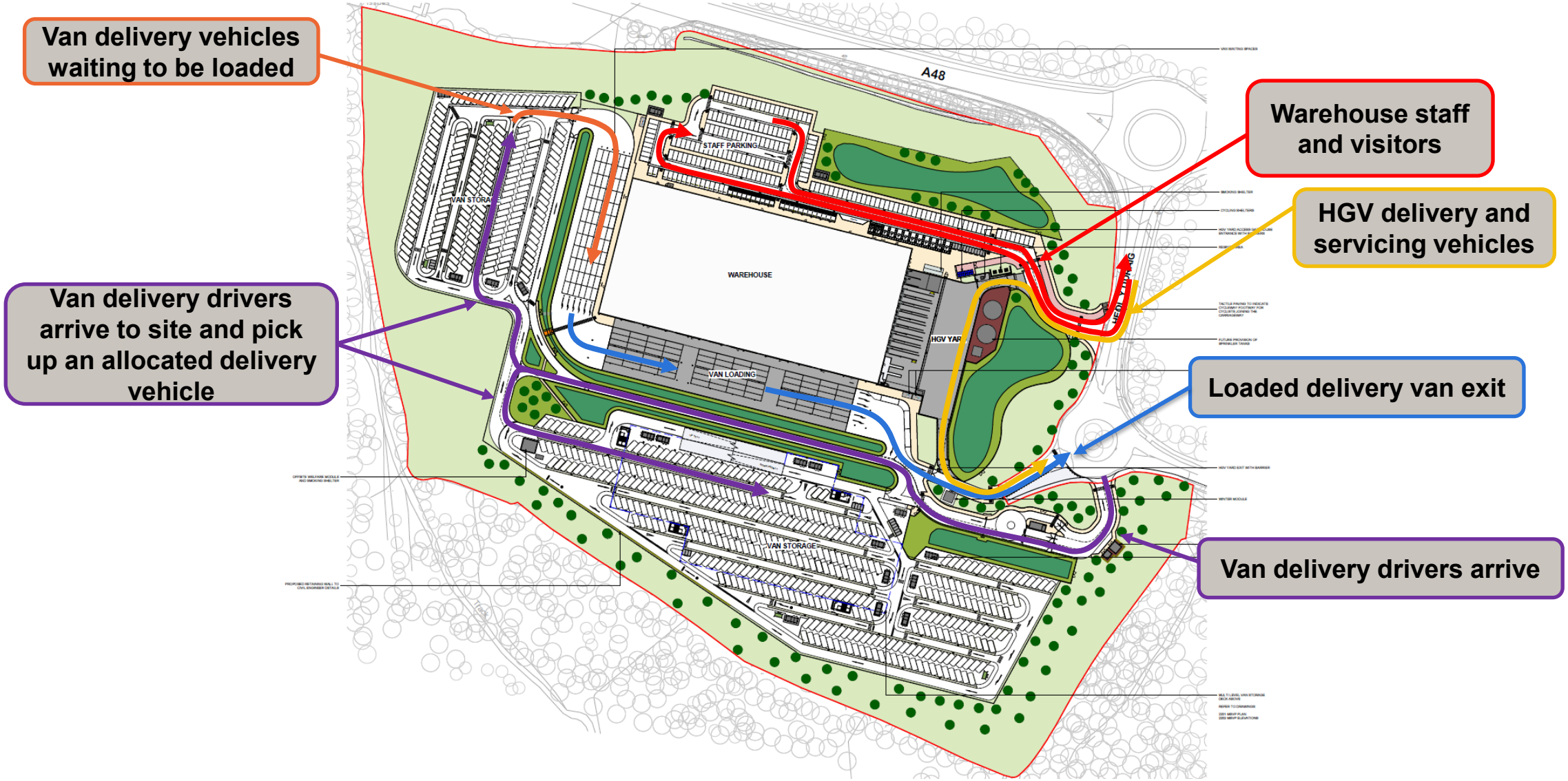
72 van loading bays
Vans being loaded before exiting the site for delivery



Drawing for illustrative purposes only

Vehicle Movements continued …

PENLLERGAER BUSINESS PARK



Description of Operation

PENLLERGAER BUSINESS PARK

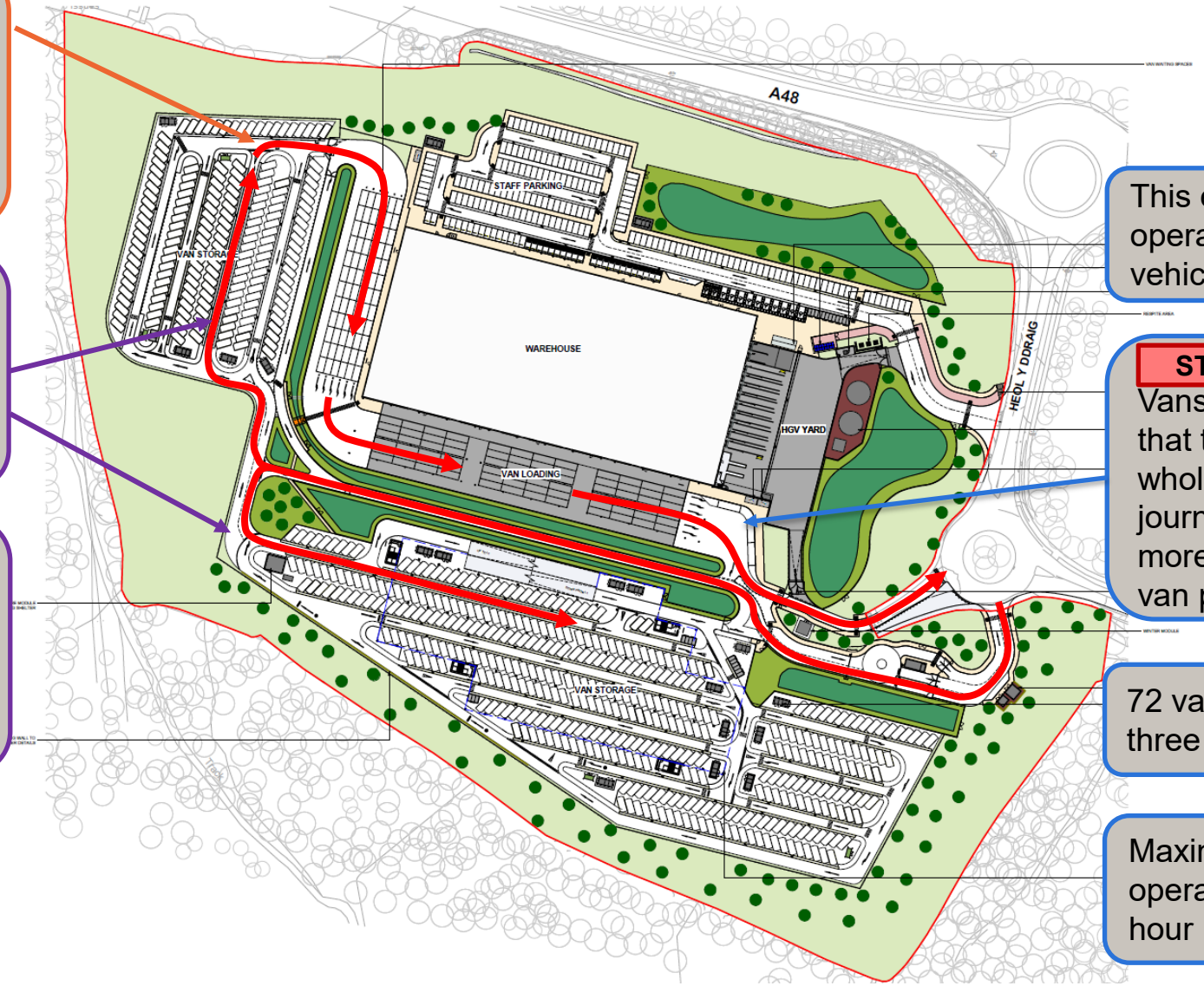
STEP 2

Once a van is collected, drivers will drive into the waiting area before the van is loaded for delivery

STEP 1

Van drivers will travel to site by their chosen method of transport and collect a van

Drivers will return their van to the van storage area at the end of their route and depart the site by their chosen method of transport



This ensures efficiency of the operation and reduces vehicle movements

STEP 3

Vans are loaded to ensure that they deliver goods for a whole route in a single journey – there will be no more than one journey per van per day

72 van loading bays turnover three times within any hour

Maximum turn over of 216 operational vans in a given hour

Rationale for Fleet Storage

PENLLERGAER BUSINESS PARK

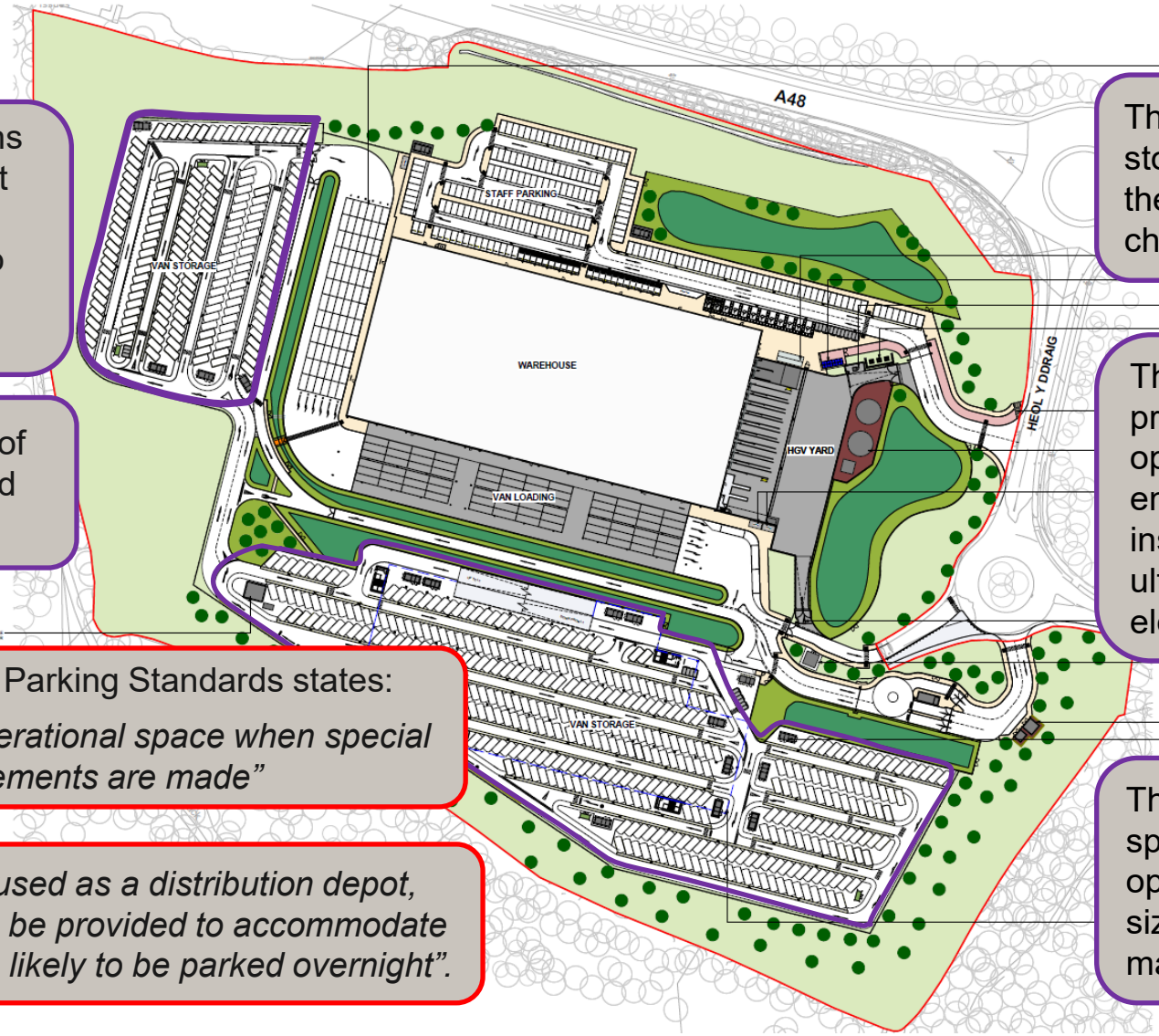
A by product of the fleet vans being stored on site is that it enables the opportunity for mode shift for van drivers to commute by sustainable modes

This also widens the scope of people that can be employed as drivers

City and County of Swansea Parking Standards states:

"Relaxation permitted for operational space when special servicing arrangements are made"

"If the premises are to be used as a distribution depot, adequate space should also be provided to accommodate commercial vehicles that are likely to be parked overnight".



The provision of operational storage on site is reflective of the need to make the supply chain more sustainable

The operational storage provided on site will allow operators to source lower emissions vehicles in the first instance and to then ultimately allow a move to an electric vehicle fleet

The maximum number of van spaces is required to allow operation of the facility of this size, plus a buffer for maintenance schedules

Appendix D

Site layout



Architects are to be notified of any discrepancies.
Contractors must check all dimensions on site.
This drawing is subject to copyright laws and is for use on this project only.
This drawing is to be used solely for the information as titled only.
For other information refer to the latest revision of any cross referenced drawings.
To be read in conjunction with relevant design standards/protocols

This is a colour drawing. In order to ensure any subsequent reproduction is viewed correctly it should be printed in full colour.

5 0 5 10 15 20 25
SCALE 1:500 m

N

SITE BOUNDARY AREA		
LINE	NAME	AREA (ha)
	APPLICATION SITE BOUNDARY	11.22

SITE MATERIALS KEY

- TARMAC, SPECIFICATION TO ENGINEERS DESIGN
- PAVEMENT FOOTPATH, SPECIFICATION TO ENGINEERS DESIGN
- PROPOSED SOFT LANDSCAPING, TO LANDSCAPING ARCHITECTS DESIGN
- PROPOSED SUDs & LANDSCAPING TO ENGINEERS AND LANDSCAPE ARCHITECTS DESIGN
- GRAVEL, SPECIFICATION TO ENGINEERS DESIGN
- CONCRETE, SPECIFICATION TO ENGINEERS DESIGN
- AREA TO BE RETAINED AND REPURPOSED FOLLOWING HIGHWAYS RESPONSE
- ASPHALT, SPECIFICATION TO ENGINEERS DESIGN
- PROPOSED DECIDUOUS TREES REFER TO LANDSCAPE ARCHITECT DRAWINGS
- ALUMINIUM GRIDDLE BRIDGE WITH ALUMINUMN METAL HANDRAILS
- FUTURE HGV EV INFASTRUCTURE WITH HGV PROTECCTIVE BOLLARDS

Rev	Description	Date	Drn	Chd
P10	END USER COMMINTARY ALTERATIONS	03.12.25	JN	-
P9	TRANSFORMERS MOVED, HGV EV FUTURE PROOFING, YARD ESCAPE ROUTE,MSVP DOOR MOVEMENTS	29.08.25	JN	EJ
P8	LANDSCAPE, FENCING ALTERATIONS, FIRE ENGINEER COMMENTS	19.06.25	JN	-
P7	GENERAL UPDATES ON PLANNING CONSULTANT COMMENTS	12.06.25	KR	JN
P6	GA UPDATED	08.05.25	SI	JN
P5	FIRST ISSUE - PLANNING	06.05.25	SI	JN
P4	FINAL REVIEW AND COMMENT ISSUE	22.04.25	JN	-
P3	CLIENT NAME UPDATED	30.08.24	VS	EJ
P2	TREE CONSTRAINTS / DRAINAGE OVERLAID	29.08.24	EJ	VS
P1	FIRST ISSUE	13.08.24	EJ	NH

Status
PLANNING

SMALLEY MARSEY RISPIN
ARCHITECTS
Floor10 The Exchange Station Parade Harrogate HG1 1TS
01423 707 757 admin@smrarchitects.co.uk

Project
Heol-y-Ddraig Penllergaer Business Park, Swansea SA4 9HL

Client
STOFORD

Drawing Title
PROPOSED SITE PLAN - PLANNING

Proj Ref	Origin	Zone	Level	Type	Role	Num	Status	Rev
7891	SMR	00	ZZ	DR	A	2003	S3	P10

SMR Job Ref	Sheet	Scale	Drawn
7891-00-2003	A0	1 : 500	EJ

Appendix E

Sensitivity Test Modelling Report

Sensitivity Test Modelling Report

Land at Penllergaer Business Park, Swansea

Hydrock now Stantec

Prepared for:
Stoford Properties Ltd

16 January 2026

Prepared by:
JB

Project/File:
35251

Stantec Hydrock Limited

Table of Contents

Document control sheet ..... **i**
1 Introduction **2**
1.1 Commission 2
1.2 Background 2

2 Sensitivity Test Scenario **3**
2.1 Introduction 3
2.2 Outline Methodology 3
2.3 Committed Development Sites 3
2.4 Development Proposal 3
2.5 Development Trip Generation 3
2.5.1 Warehouse Staff 4
2.6 Vehicle Trip Generation and Distribution 6
2.7 Site Access 7
2.8 Mitigation Scheme 7

3 Modelling Results **8**
3.1 Introduction 8
3.2 Network Wide Model Statistics 8
3.2.1 Analysis of Network Wide Model Statistics 14
3.3 Journey Time Analysis 15
3.4 Junction Statistics 19
3.4.1 M4 Junction 47 Penllergaer Interchange 20
3.4.2 M4 Junction 46 22
3.4.3 Penllergaer Business Park Roundabout 25
3.4.4 A48 Clasemont Road / Pant Lasau Road 27
3.4.5 Analysis of Junction Statistics 28

4 Summary and Conclusion **30**
4.1 Introduction 30
4.2 Future Year Modelling 30
4.3 Conclusion 30

List of Tables

Table 1: Proposed Development Vehicle Trip Generation 6
Table 2: Network Statistics | AM Peak Period (07:00 – 10:00) 9
Table 3: Network Statistics | PM Peak Period (15:00 – 19:00) 10
Table 4: Journey Time Analysis | AM Peak | 07:00 – 10:00 17
Table 5: Journey Time Analysis | PM Peak | 15:00 – 19:00 18
Table 6: Individual Arm Statistics Description 19
Table 7: Junction Statistics | M4 Junction 47 Penllergaer Interchange | AM Peak Period 20
Table 8: Junction Statistics | M4 Junction 47 Penllergaer Interchange | PM Peak Period 21
Table 9: Junction Statistics | M4 Junction 46 | AM Peak Period 22
Table 10: Junction Statistics | M4 Junction 46 | PM Peak Period 24
Table 11: Junction Statistics | Penllergaer Business Park Roundabout | AM Peak Period 25
Table 12: Junction Statistics | Penllergaer Business Park Roundabout | PM Peak Period 26
Table 13: Junction Statistics | A48 Clasemont Road / Pant Lasau Road | AM Peak Period 27
Table 14: Junction Statistics | A48 Clasemont Road / Pant Lasau Road | PM Peak Period 28

List of Figures

Figure 1: Journey Time Routes 15

1 Introduction

1.1 Commission

Stantec has been appointed by Stoford Properties Ltd to undertake Aimsun modelling in support of a Planning Application for the development of a distribution centre on the Land at Penllergaer Business Park, Swansea. The proposed development will accommodate a floor area of 12,465sqm.

1.2 Background

An Aimsun microsimualtion base model has been calibrated and validated to meet all relevant criteria set out by TAG Unit M3.1. This is documented in full in the corresponding Model Validation Report[1].

This report sets out the modelling results from the Sensitivity Test scenario. The report is to be read in conjunction with the Transport Assessment[2] and Aimsun Modelling[3] that have been prepared to accompany the planning application and that are submitted under separate cover.

[1] *Land at Penllergaer Business Park, Swansea – Model Validation Report*, Hydrock now Stantec, 03 June 2025.
[2] *Distribution Centre, Penllergaer* - Transport Assessment, Hydrock now Stantec, 2025.
[3] *Land at Penllergaer Business Park, Swansea – Modelling Report*, Hydrock now Stantec, 2025.

2 Sensitivity Test Scenario

2.1 Introduction

In the original modelling and Transport Assessment, the operation of the warehouse was detailed which outlines how the warehouse staff movements cannot occur during peak operational movements (ie three van turnovers an hour). It was detailed how any warehouse shift change over would occur outside of the modelled periods, in line with the expected operational model for the site. However, as requested by Swansea City & County Council, a sensitivity test has been modelled to assess a scenario where a change of shift for warehouse staff occurs during the peak highway and site operation hour.

This scenario should be treated as a sensitivity test, the applicant has outlined that the peak operation of the warehouse cannot function unless the warehouse staff have been on site prior to commencement. This scenario is therefore not considered to be a realistic representation of how the site would operate, however it serves to satisfy the local highway authority in their concerns over a 'what if' scenario.

2.2 Outline Methodology

The methodology used for the sensitivity test is consistent with the core scenarios as presented in the Modelling Report. The methodology is outlined below.

2.3 Committed Development Sites

All committed development and traffic growth remains as outlined in the Modelling Report.

2.4 Development Proposal

The proposed development would seek to provide a distribution warehouse of approximately 12,465sqm. Vehicular access to the development is proposed to be provided from the existing roundabout on the A48 with small changes to the internal roundabout within Penllergaer Business Park.

2.5 Development Trip Generation

The forecast demand methodology remains as presented in the Modelling Report. The only change to the demand is the addition of warehouse staff trips in the AM and PM peak hour. A summary of development traffic demand is provided below.

2.5.1 Warehouse Staff

As requested by the local highway authority warehouse staff have been included in the peak hour assessment. Whilst it has been outlined by the applicant that warehouse staff would need to arrive onsite in advance of the site peak operation (ie a turn over of vans three times an hour), for the purposes of the sensitivity test it has been assumed that a warehouse shift change occurs in the AM and PM peak hours.

The peak network hours have been calculated using the base traffic demand within the model study area, this is presented on Figure 1 and Figure 2.

Figure 1: Base Model Traffic Demand - AM Peak Period

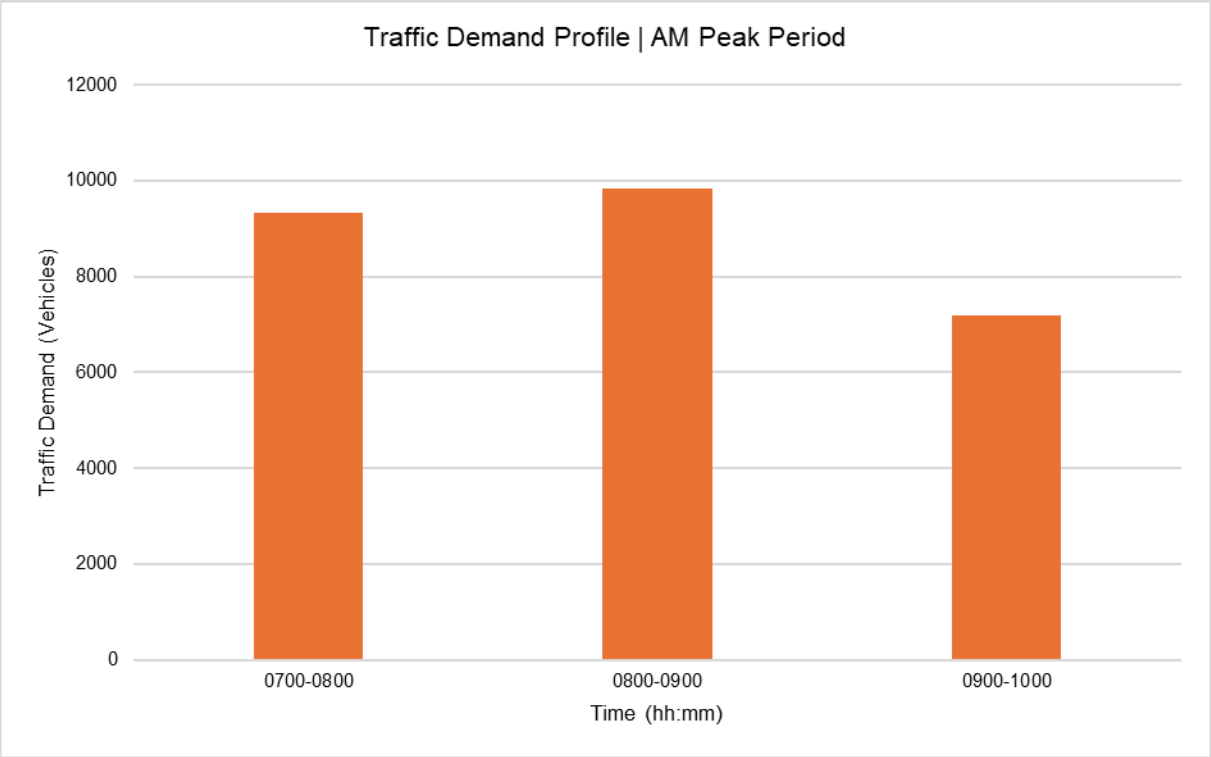
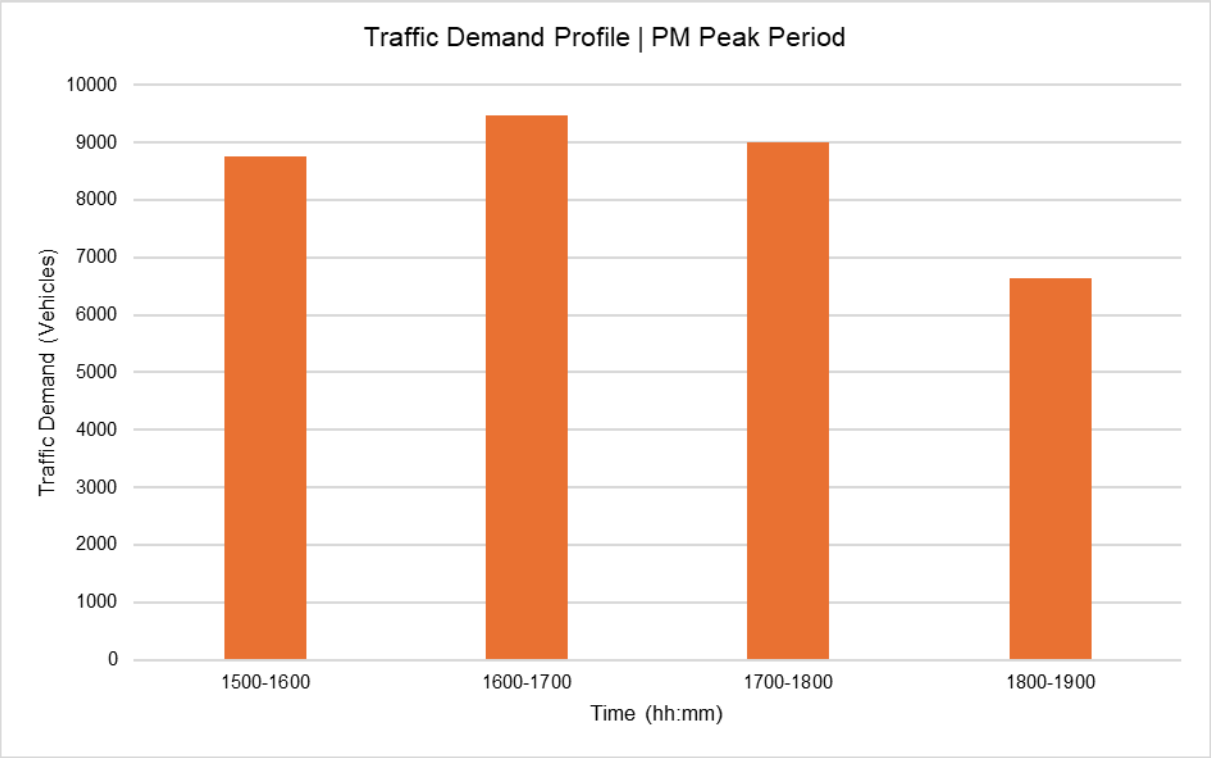


Figure 2: Base Model Traffic Demand - PM Peak Period



As shown the AM peak hour is 0800 to 0900 and the PM peak hour is 1600 to 1700. For the purposes of a robust sensitivity test it has been assumed that a warehouse staff changeover occurs during these peak hours.

With regards to trip generation there are 221 staff parking spaces, 10% of these spaces are for visitors or staff that remain on site throughout the peak periods. As such this means the remaining 90% of parking spaces are used for a staff changeover, which equates to around 200 spaces. The arrivals and departures of warehouse staff changeover occur in the peak hour meaning 100 car vehicle arrivals and departures during the AM peak (0800 to 0900) and PM peak (1600 to 1700). These trips have been included in the sensitivity test development demand matrices.

2.6 Vehicle Trip Generation and Distribution

The vehicle trip generation and distribution is outlined within the Transport assessment and broken down per trip purpose. The total trip generation per vehicle is summarised in Table 1

Table 1: Proposed Development Vehicle Trip Generation

Time Period	Car		LGV		HGV	
	Arr.	Dep.	Arr.	Dep.	Arr.	Dep.
AM Peak Period						
07:00 to 08:00	0	0	216	216	11	11
08:00 to 09:00	100	100	216	216	11	11
09:00 to 10:00	0	0	216	216	11	11
PM Peak Period						
15:00 to 16:00	0	0	216	216	11	11
16:00 to 17:00	100	100	216	216	11	11
17:00 to 18:00	0	0	216	216	11	11
18:00 to 19:00	0	0	216	216	11	11

2.7 Site Access

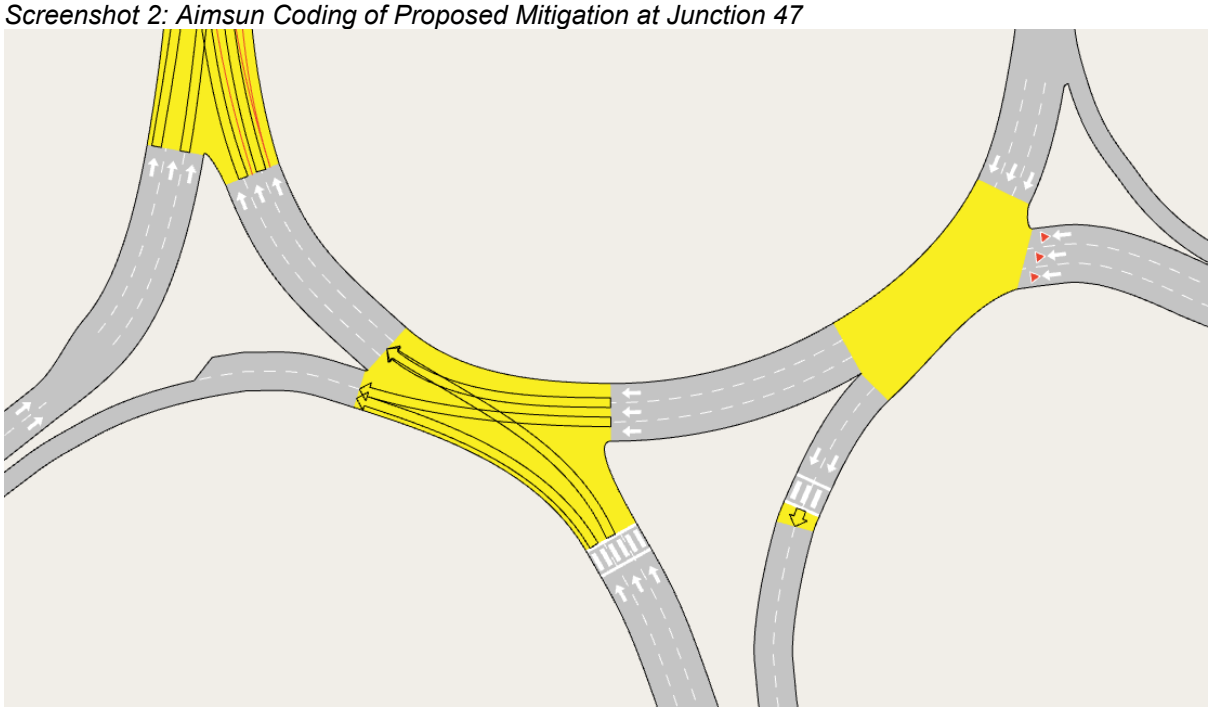
The site access proposals remain as previously modelled and detailed within the Transport assessment.

2.8 Mitigation Scheme

The mitigation scheme remains as previously modelled and detailed within the Transport assessment.

The proposed mitigation is to provide an additional lane on the southern circulatory along with a two-lane flared exit to the A48 south. The proposed layout is detailed within the Transport Assessment, whilst the model coding is shown on Screenshot 2.

Screenshot 2: Aimsun Coding of Proposed Mitigation at Junction 47



3 Modelling Results

3.1 Introduction

The following section presents the results of the Aimsun modelling.

In line with the core scenarios the proposed sensitivity test has been undertaken using a 2027 opening year and 2037 future year. For the purposes of the sensitivity test the following scenarios have been modelled:

- 2027/2037 Do Minimum: Base traffic + consented committed developments.
- 2027/2037 With Development Mitigation: Base traffic + consented committed developments + proposed development (including warehouse staff) + mitigation.

3.2 Network Wide Model Statistics

Network statistics provide a strategic overview of the performance of the whole network. These statistics have been extracted to understand the wider network impacts across each of the modelled scenarios. The following statistics are reported:

- **Total travel time per vehicle (unit: s):** mean time it takes for vehicles to travel through the network in the modelled time period. This includes the total travel time in virtual queues.
- **Delay time (unit: s/km):** mean delay incurred by vehicles travelling through the network in the modelled time period and is calculated as the difference between actual travel time and free flow travel.
- **Speed (unit: km/h):** mean speed of vehicles in the network.
- **Stop time (unit: s/km):** mean amount of time that vehicles are stationary.
- **Density (unit: veh/km):** the mean number of vehicles per km of road space and is an indicator of queuing and congestion.
- **Mean Queue (unit: veh):** the mean number of vehicles in queuing in the model, averaged over the modelled period.
- **Flow (unit: veh/h):** mean number of vehicles that pass through the network in the modelled time period.
- **Vehicles Out (unit: veh):** number of vehicles that have left the network during the simulation period.
- **Vehicles In (unit: veh):** number of vehicles inside the network when the simulation period finishes.
- **Vehicles Waiting to Enter (unit: Veh):** number of vehicles that are waiting to enter the network.

The network wide model statistics for each future assessment year scenario are summarised in Table 2 and Table 3.

Table 2: Network Statistics | AM Peak Period (07:00 – 10:00)

Statistic	Units	2025 Base	2027 Do Minimum	2027 With Dev Mit Sens Test	Absolute Change (% Change)	2037 Do Minimum	2037 With Dev Mit Sens Test	Absolute Change (% Change)
Total Travel Time	sec/km	77	81	81	+0.1 (+0.1%)	96	86	-10.1 (-10.5%)
Delay	sec/km	27	31	31	-0.3 (-0.9%)	46	36	-10.3 (-22.4%)
Density	veh/km	7	8	8	+0.1 (+1.7%)	10	8	-1.3 (-13.6%)
Mean Queue	veh	88	110	101	-9.6 (-8.7%)	209	125	-83.9 (-40.1%)
Speed	km/h	60	58	58	-0.2 (-0.4%)	53	57	+3.2 (+5.9%)
Stop Time	sec/km	17	21	21	-0.3 (-1.2%)	32	24	-7.9 (-24.5%)
Flow	veh/h	8,811	8,907	9,430	+522.3 (+5.9%)	9,077	9,663	+586.4 (+6.5%)
Vehicles Out	veh	26,433	26,722	28,289	+1566.8 (+5.9%)	27,230	28,990	+1759.3 (+6.5%)
Vehicles In	veh	360	372	392	+20.4 (+5.5%)	737	444	-293.4 (-39.8%)
Vehicles Waiting to Enter	veh	1	1	1	+0.3 (+50.0%)	234	309	+75.1 (+32.1%)

Notes: absolute difference (relative difference)

Table 3: Network Statistics | PM Peak Period (15:00 – 19:00)

Statistic	Units	2025 Base	2027 Do Minimum	2027 With Dev	Absolute Change (% Change)	2037 Do Minimum	2037 With Dev	Absolute Change (% Change)
Total Travel Time	sec/km	76	80	79	-1.0 (-1.2%)	104	89	-15.6 (-14.9%)
Delay	sec/km	26	29	28	-1.3 (-4.3%)	53	37	-15.8 (-29.8%)
Density	veh/km	7	7	7	-0.1 (-2.0%)	10	8	-2.2 (-21.8%)
Mean Queue	veh	78	96	80	-15.6 (-16.3%)	201	123	-78.1 (-38.9%)
Speed	km/h	59	58	59	+1.0 (+1.7%)	50	56	+6.0 (+11.9%)
Stop Time	sec/km	16	18	19	+0.3 (+1.6%)	32	26	-6.0 (-18.3%)
Flow	veh/h	8,497	8,579	9,086	+506.9 (+5.9%)	8,849	9,375	+525.7 (+5.9%)
Vehicles Out	veh	33,986	34,316	36,343	+2027.4 (+5.9%)	35,398	37,500	+2102.6 (+5.9%)
Vehicles In	veh	304	310	333	+23.3 (+7.5%)	508	390	-118.5 (-23.3%)
Vehicles Waiting to Enter	veh	0	0	1	+0.2 (+50.0%)	1	11	+10.1 (+2020.0 %)

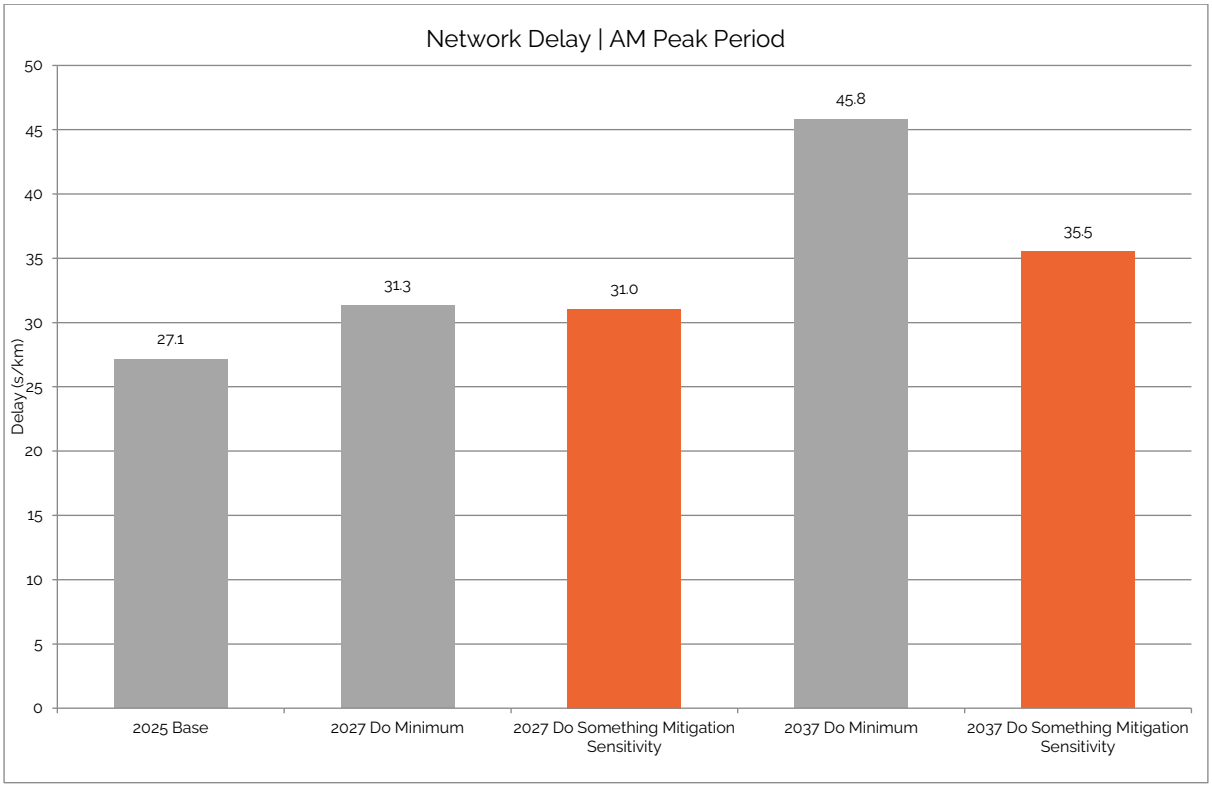
Notes: absolute difference (relative difference)

In order to better understand the network statistics some of these have been presented as graphs, as set out below:

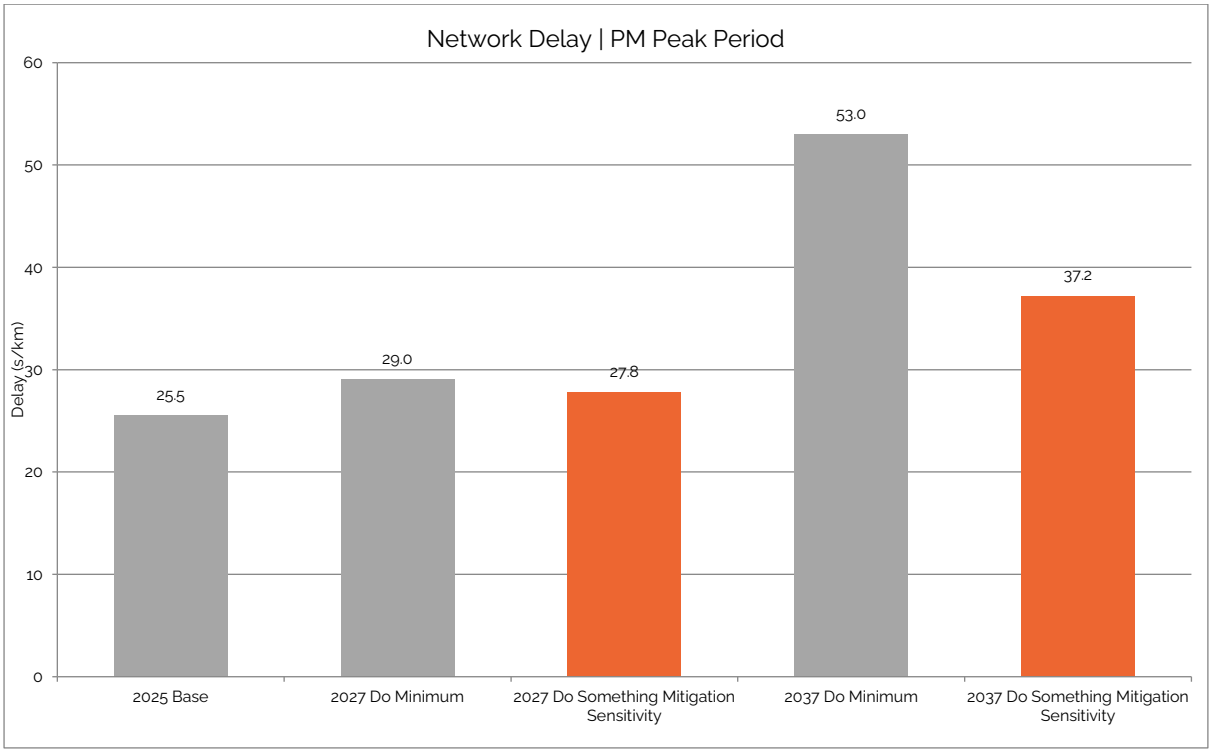
- **Delay (unit: sec / km):** Graph 1 and Graph 2 present the average delay incurred by vehicles travelling through the network in the modelled time period and is calculated as the difference between actual travel time and free flow travel. These graphs provide an overview of model performance and can be used as a general indicator of network conditions.

- **Network Throughput (unit: veh):** Graph 3 and Graph 4 present stacked bar charts showing vehicles that have passed through the model, the vehicles inside the model, and vehicles waiting to enter the model. These give an overview of the state of the network at the end of the simulation period. The sum of these statistics is equal to the overall demand, with the number of vehicles inside the network and waiting to enter the network giving an indication of whether the network is operating within capacity.

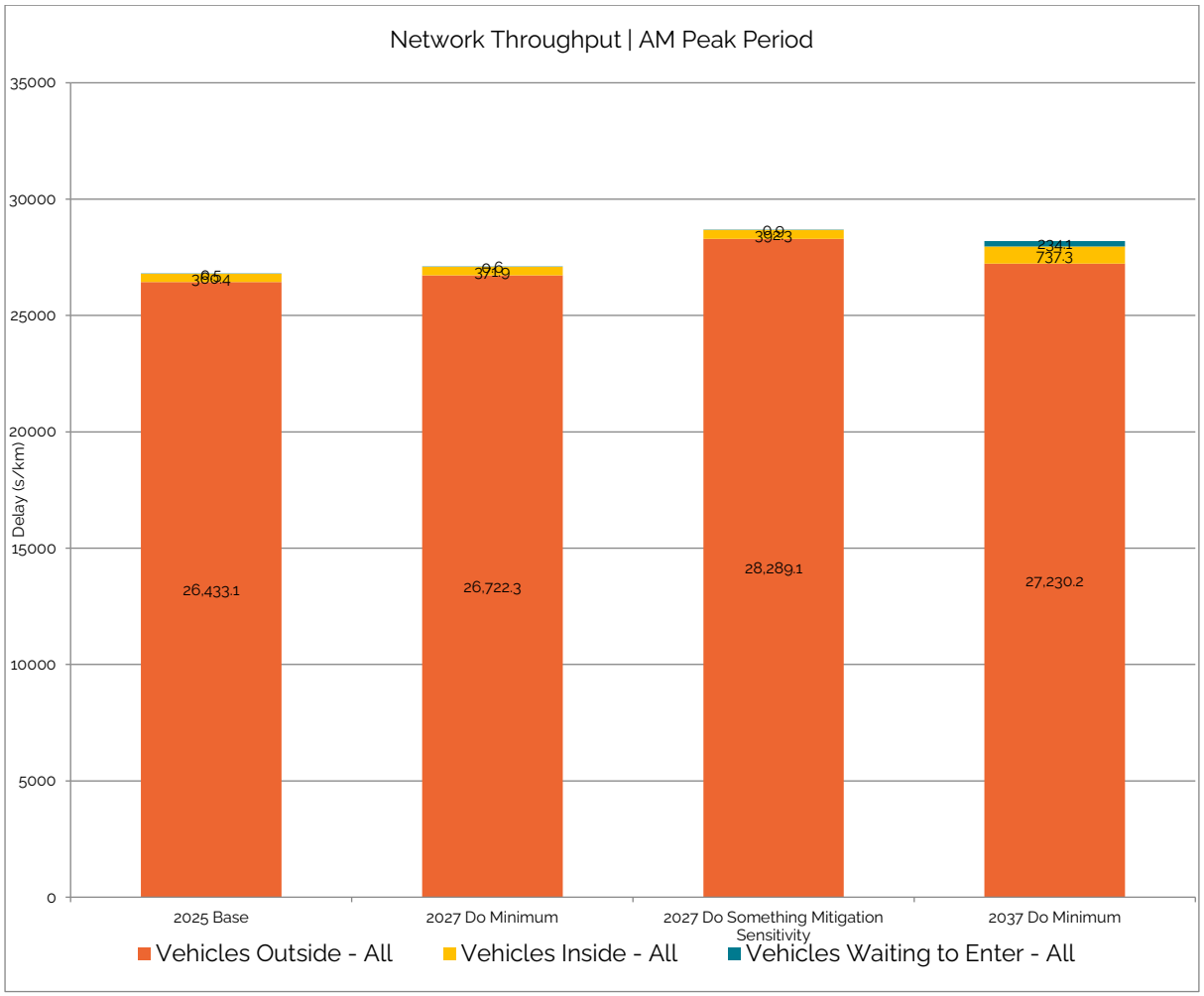
Graph 1: Network Delay - AM Peak Period



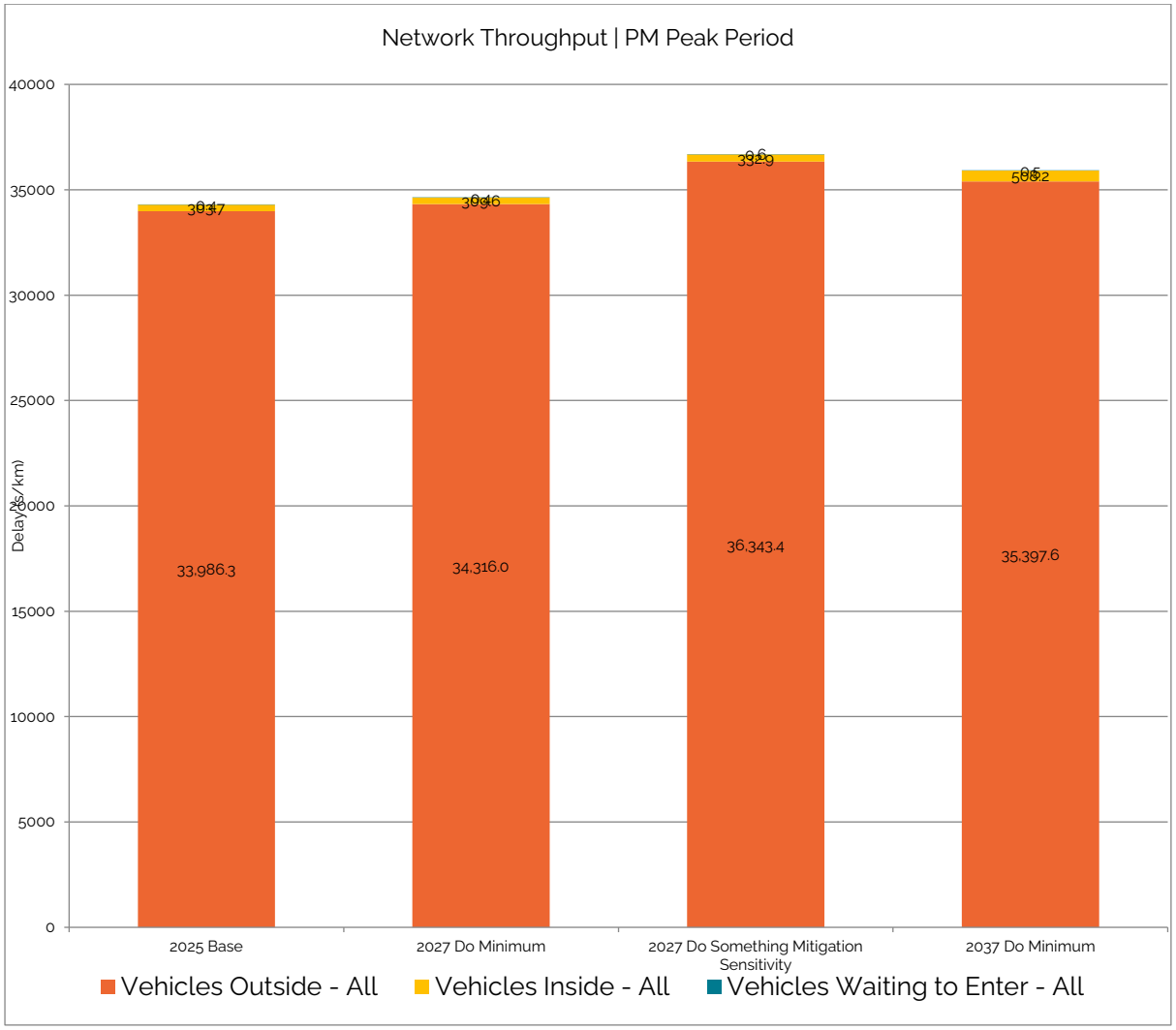
Graph 2: Network Delay - PM Peak Period



Graph 3: Network Throughput - AM Peak Period



Graph 4: Network Throughput - PM Peak Period



3.2.1 Analysis of Network Wide Model Statistics

In 2027, the modelling shows that the proposed development with mitigation is predicted to reduce network delay by -0.3s per km in the AM peak and -1.3s in the PM peak compared to the Do Minimum scenario. This equates to a reduction in network-wide mean queueing of -9.6 and -15.6 vehicles and changes in network-wide speed of -0.2km/h and +1.0km/h. In terms of network throughput (which is an indicator of network capacity), reasonably small variations in the number of vehicles either queueing inside the model (vehicles inside) and vehicles queueing outside of the model (vehicles waiting to enter) is predicted. The results show that the proposed mitigation more than offsets the impact of the proposed development.

In 2037, the modelling shows that the proposed development is predicted to reduce network delay by -10.3s per km in the AM peak and -15.8s in the PM peak. This equates to a decrease in network-wide mean queueing of -83.9 and -78.1 vehicles and an increase in network-wide speed of +3.2km/h and

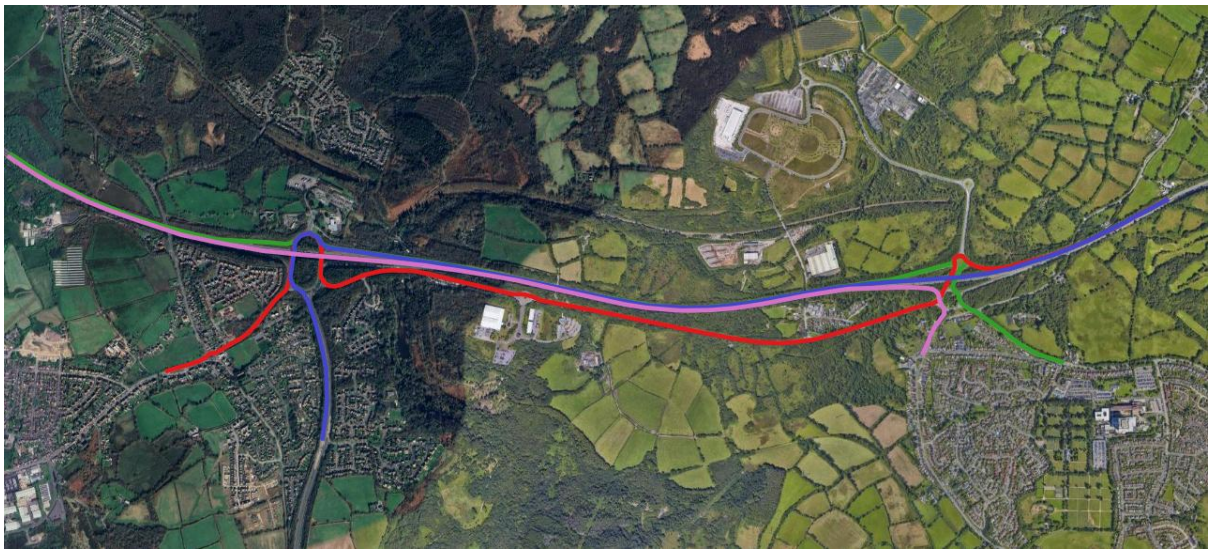
+6.0km/h. In terms of network throughput (which is an indicator of network capacity), there are noticeable increases in vehicles out and a reduction in vehicles in, which highlights that, where previously there were still vehicles inside the model at the end of the peak period due to congestion, these vehicles are now travelling through the model. The results show that the proposed mitigation more than offsets the impact of the proposed development, particularly in the 2037 scenario when there is more congestion and delay in the network due to committed developments.

3.3 Journey Time Analysis

Journey time statistics have been extracted from Aimsun for the pre-defined journey time validation routes for each future assessment year scenario in order to understand the impact of the proposed development. A total of eight journey time routes have been analysed that cover key routes and congested junctions within the model. The journey time routes defined are illustrated on Figure 3 and are listed below:

- Route 1A - M4 west to A48 east (via M4)
- Route 1B - A48 west to M4 east (via M4)
- Route 2A - A4240 Gorseinon Road to M4 east (via A48)
- Route 2B - M4 east to A4240 Gorseinon Road (via A48)
- Route 3A - A483 to M4 east (via M4)
- Route 3B - A4 east to A483 (via M4)
- Route 4A - B4489 Swansea Road to M4 west (via M4)
- Route 4B - M4 west to B4489 Swansea Road (via M4)

Figure 3: Journey Time Routes



In validating transport models, it is usual practice to consider that journey times that are modelled to within 15% of observed journey times (or within 1 minute if higher than 15%) are acceptable. This is because journey times can typically vary by 15% from day-to-day with shorter journey times

experiencing much larger relative variations. This threshold has therefore been adopted for the purpose of this analysis in order to determine whether the proposed development would give rise to a material impact on journey times.

Notwithstanding this, whilst a development may give rise to a material impact on journey times, this does not necessarily mean that it should automatically be considered to be severe. Rather it suggests that drivers would experience an increase in journey time that is beyond what they would expect to encounter on a day-to-day basis. However, it does provide a minimum threshold below which a journey time impact should not be considered to be severe. Determining the severity of an increase is subjective and should be considered on a case-by-case basis, however for the purpose of this assessment the severity of an impact is defined as:

- For journey times less than 600s (ten minutes) an impact of ≥ 180s (three minutes) is considered severe.
- For journey times more than 600s (ten minutes) an impact of ≥ 30% is considered severe.
- For journey times of exactly 600s (ten minutes) both of the criteria set out above would apply.

Table 4 and Table 5 presents the peak period journey time impact (both absolute and relative) for each future assessment year scenario, compared to the corresponding scenario with the proposed development in place. Note these statistics also include wait time in virtual queues to capture any suppressed demand outside of the model.

Table 4: Journey Time Analysis | AM Peak | 07:00 – 10:00

Route	2025 Base	2027 Do Minimum	2027 With Dev Mitigation Sensitivity	Absolute Change (% Change)	2037 Do Minimum	2037 With Dev Mitigation Sensitivity	Absolute Change (% Change)
Route 01-A	04:19	04:19	04:24	00:05 (2.1%)	04:18	04:21	00:03 (1.2%)
Route 01-B	04:09	04:11	04:18	00:07 (2.9%)	05:33	04:15	-01:14 (-23.3%)
Route 02-A	07:53	10:24	11:48	01:24 (13.4%)	23:16	24:51	01:35 (6.9%)
Route 02-B	06:27	06:30	07:12	00:43 (11.0%)	06:22	06:56	00:34 (9.0%)
Route 03-A	05:12	05:34	05:16	-00:18 (-5.5%)	07:14	06:31	-00:43 (-10.0%)
Route 03-B	04:55	05:32	03:57	-01:35 (-28.5%)	09:41	03:59	-05:42 (-58.8%)
Route 04-A	03:28	03:28	03:43	00:14 (6.8%)	04:52	03:49	-01:03 (-21.5%)
Route 04-B	03:58	03:58	04:03	00:05 (2.2%)	03:58	04:01	00:03 (1.2%)

Table 5: Journey Time Analysis | PM Peak | 15:00 – 19:00

Route	2025 Base	2027 Do Minimum	2027 With Dev Mitigation Sensitivity	Absolute Change (% Change)	2037 Do Minimum	2037 With Dev Mitigation Sensitivity	Absolute Change (% Change)
Route 01-A	04:06	04:07	04:09	00:03 (1.0%)	04:07	04:10	00:02 (1.0%)
Route 01-B	04:26	04:37	04:58	00:21 (7.4%)	06:25	04:56	-01:30 (-23.3%)
Route 02-A	07:30	08:09	09:06	00:57 (11.7%)	11:52	15:23	03:31 (29.7%)
Route 02-B	07:16	08:03	06:00	-02:02 (-25.3%)	15:26	09:37	-05:49 (-37.7%)
Route 03-A	04:39	04:46	04:22	-00:24 (-8.3%)	05:51	04:45	-01:06 (-18.8%)
Route 03-B	04:45	05:30	03:58	-01:32 (-27.8%)	09:31	04:04	-05:27 (-57.3%)
Route 04-A	03:58	04:14	06:15	02:01 (47.5%)	06:06	07:19	01:14 (20.2%)
Route 04-B	03:47	03:47	03:50	00:03 (1.2%)	03:48	03:50	00:02 (1.1%)

3.3.1 Analysis of Journey Times

Across all of the time periods and scenarios assessed, the modelling suggests that in the 2027 scenario the proposed development with mitigation would overall be net neutral to the network with changes in journey time of of +6 and -4 seconds when averaged across all routes. The largest residual journey time increase occurs for Route 04-A in the PM peak period, where journey times are forecast to increase by 2 minutes and 1 second. However, this increase is offset by reductions on other routes. Similarly, in the 2037 scenario it is shown that the development with mitigation also provides an overall net benefit to the network with a reduction in total journey time when averaged across all routes of -49s and -68s in each peak period. It is noted that no journey time increases meet the thresholds, as set out in Section 3.3, which consider a severe impact.

3.4 Junction Statistics

As agreed with Swansea Council, key junctions have been identified where detailed junction statistics have been extracted for all future assessment year scenarios with and without the proposed development in place. Table 6 explains the statistics that are presented.

- Junction 47 Penllergaer Interchange
- M4 Junction 46
- Penllergaer Business Park / A48
- A48 Clasemont Road / Pant Lasau Road.

Table 6: Individual Arm Statistics Description

Statistic	Units	Analytical Use
Flow	veh/h	This shows the actual traffic flow on each arm of the junction.
Delay	S	This shows the delay experienced by each vehicle on each arm of the junction and is calculated as the difference between the actual travel time and free-flow travel time.
Mean Queue	Veh	This shows the time-averaged mean queue.
Speed	km/h	This shows the average speed on each arm of the junction.

It should be noted that the approach arms analysed are defined manually and cover multiple sections of the model on approach to the junctions assessed. These sections are usually selected based on the animated simulation of the model and cover the links where queueing and congestion would occur at the junction in consideration. In congested models, defining the assessment sections is more subjective as queues can extend well beyond the extent of the junction assessed. For this reason, it is important to consider the assessment of journey times alongside any isolated junction statistics. Individual arm statistics showing the impact (both absolute and relative) compared to the corresponding Do Minimum scenario are presented in Table 7 to Table 14.

3.4.1 M4 Junction 47 Penllergaer Interchange

Table 7: Junction Statistics | M4 Junction 47 Penllergaer Interchange | AM Peak Period

Statistic	2027 Do Minimum	2027 With Dev Mitigation	Absolute Change (% Change)	2037 Do Minimum	2037 With Dev Mitigation	Absolute Change (% Change)
Arm A: Services						
Flow	205.7	206.1	0.4 (0.2%)	205.7	206.1	0.4 (0.2%)
Delay	6.0	6.6	0.6 (9.3%)	6.4	13.7	7.4 (115.6%)
Mean Queue	0.8	0.8	0.0 (4.0%)	0.8	0.8	0.0 (3.7%)
Speed	28.4	27.7	-0.7 (-2.6%)	27.5	27.1	-0.5 (-1.7%)
Arm B: M4 East						
Flow	902.6	904.3	1.7 (0.2%)	890.0	973.6	83.6 (9.4%)
Delay	111.9	24.9	-87.1 (-77.8%)	254.2	27.0	-227.1 (-89.4%)
Mean Queue	11.5	2.2	-9.3 (-81.0%)	30.9	2.5	-28.4 (-91.9%)
Speed	10.8	11.9	1.1 (10.6%)	9.8	11.5	1.8 (18.1%)
Arm C: A48 East						
Flow	265.2	399.7	134.6 (50.7%)	265.2	396.3	131.1 (49.4%)
Delay	25.0	14.5	-10.5 (-42.1%)	27.5	16.4	-11.0 (-40.2%)
Mean Queue	0.8	0.6	-0.2 (-28.6%)	0.9	0.8	-0.1 (-15.3%)
Speed	14.9	19.0	4.1 (27.4%)	13.7	17.5	3.8 (27.9%)
Arm D: A483						
Flow	1,437.0	1,483.6	46.6 (3.2%)	1,529.8	1,566.3	36.6 (2.4%)
Delay	90.2	68.5	-21.7 (-24.0%)	94.4	70.8	-23.6 (-25.0%)
Mean Queue	6.0	4.3	-1.7 (-27.6%)	18.2	13.1	-5.1 (-27.8%)
Speed	16.5	17.1	0.6 (3.6%)	16.4	17.0	0.5 (3.2%)
Arm E: A48 Southwest						
Flow	978.9	1,019.5	40.6 (4.1%)	1,054.7	1,068.3	13.6 (1.3%)
Delay	48.0	29.1	-18.8 (-39.3%)	46.5	24.7	-21.8 (-46.9%)
Mean Queue	4.7	2.8	-1.9 (-41.1%)	4.8	2.4	-2.5 (-50.9%)

Statistic	2027 Do Minimum	2027 With Dev Mitigation	Absolute Change (% Change)	2037 Do Minimum	2037 With Dev Mitigation	Absolute Change (% Change)
Speed	12.9	15.8	2.9 (22.2%)	12.9	16.1	3.2 (25.0%)
Arm F: M4 West						
Flow	545.2	593.2	48.0 (8.8%)	567.6	614.5	46.9 (8.3%)
Delay	37.8	56.5	18.6 (49.2%)	41.2	65.6	24.5 (59.4%)
Mean Queue	2.5	3.8	1.4 (54.8%)	2.7	4.5	1.8 (68.7%)
Speed	9.6	8.0	-1.6 (-17.0%)	9.2	7.6	-1.6 (-17.0%)

Table 8: Junction Statistics | M4 Junction 47 Penllergaer Interchange | PM Peak Period

Statistic	2027 Do Minimum	2027 With Dev Mitigation	Absolute Change (% Change)	2037 Do Minimum	2037 With Dev Mitigation	Absolute Change (% Change)
Arm A: Services						
Flow	166.4	169.0	2.6 (1.6%)	166.4	167.6	1.3 (0.8%)
Delay	4.1	5.0	0.9 (21.3%)	4.7	5.3	0.7 (14.1%)
Mean Queue	0.7	0.7	0.0 (6.3%)	0.7	0.7	0.0 (4.6%)
Speed	32.0	29.8	-2.2 (-6.8%)	31.0	29.1	-1.9 (-6.1%)
Arm B: M4 east						
Flow	1,329.5	1,332.9	3.3 (0.3%)	1,400.4	1,412.8	12.4 (0.9%)
Delay	91.4	19.1	-72.3 (-79.1%)	172.7	20.7	-151.9 (-88.0%)
Mean Queue	13.0	2.3	-10.7 (-82.5%)	28.1	2.5	-25.6 (-91.0%)
Speed	18.4	18.1	-0.3 (-1.6%)	17.4	18.0	0.6 (3.4%)
Arm C: A48 east						
Flow	320.9	453.2	132.3 (41.2%)	295.7	449.9	154.2 (52.1%)
Delay	148.0	21.7	-126.3 (-85.4%)	496.8	165.2	-331.6 (-66.8%)
Mean Queue	9.3	1.2	-8.1 (-86.7%)	36.6	15.2	-21.4 (-58.4%)
Speed	9.7	17.9	8.2 (84.0%)	5.9	13.0	7.2 (121.5%)
Arm D: A483						
Flow	1,298.3	1,333.1	34.8 (2.7%)	1,377.0	1,418.2	41.2 (3.0%)

Statistic	2027 Do Minimum	2027 With Dev Mitigation	Absolute Change (% Change)	2037 Do Minimum	2037 With Dev Mitigation	Absolute Change (% Change)
Delay	49.6	31.5	-18.1 (-36.4%)	55.2	51.9	-3.3 (-6.0%)
Mean Queue	2.7	1.8	-1.0 (-35.2%)	7.9	3.0	-4.8 (-61.5%)
Speed	14.5	16.2	1.8 (12.3%)	14.3	15.7	1.4 (9.7%)
Arm E: A48 Southwest						
Flow	811.1	852.2	41.1 (5.1%)	909.3	940.5	31.2 (3.4%)
Delay	25.1	22.7	-2.4 (-9.7%)	27.1	23.9	-3.3 (-12.0%)
Mean Queue	2.2	2.1	-0.1 (-5.2%)	2.6	2.3	-0.2 (-9.4%)
Speed	13.2	14.5	1.3 (10.2%)	13.0	14.4	1.3 (10.3%)
Arm F: M4 West						
Flow	462.6	508.7	46.1 (10.0%)	487.9	535.7	47.8 (9.8%)
Delay	23.6	28.7	5.1 (21.5%)	24.1	29.6	5.5 (23.1%)
Mean Queue	1.3	1.6	0.3 (25.7%)	1.3	1.8	0.4 (30.9%)
Speed	14.0	10.8	-3.2 (-22.7%)	13.8	10.6	-3.2 (-23.1%)

3.4.2 M4 Junction 46

Table 9: Junction Statistics | M4 Junction 46 | AM Peak Period

Statistic	2027 Do Minimum	2027 With Dev Mitigation	Absolute Change (% Change)	2037 Do Minimum	2037 With Dev Mitigation	Absolute Change (% Change)
Arm A: B4489 North						
Flow	142.9	143.2	0.3 (0.2%)	142.9	142.7	-0.2 (-0.2%)
Delay	2.4	2.7	0.3 (14.1%)	2.5	5.5	3.0 (121.7%)
Mean Queue	0.1	0.1	0.0 (39.6%)	0.1	0.1	0.0 (14.6%)
Speed	41.3	40.3	-1.0 (-2.4%)	41.1	40.2	-0.9 (-2.1%)
Arm B: M4 East						
Flow	529.6	580.0	50.4 (9.5%)	529.6	581.5	51.9 (9.8%)
Delay	46.6	81.6	35.0 (75.2%)	35.0	60.7	25.6 (73.1%)
Mean Queue	3.6	6.7	3.1 (86.6%)	2.7	5.0	2.2 (81.2%)

Statistic	2027 Do Minimum	2027 With Dev Mitigation	Absolute Change (% Change)	2037 Do Minimum	2037 With Dev Mitigation	Absolute Change (% Change)
Speed	31.8	26.9	-5.0 (-15.6%)	33.5	28.5	-5.0 (-14.9%)
Arm C: A48 Southeast						
Flow	581.7	618.2	36.5 (6.3%)	581.5	615.1	33.6 (5.8%)
Delay	2.9	4.1	1.2 (43.3%)	2.9	3.9	1.0 (33.9%)
Mean Queue	0.3	0.5	0.1 (37.6%)	0.4	0.5	0.1 (16.5%)
Speed	34.1	29.4	-4.7 (-13.8%)	34.3	30.2	-4.1 (-11.9%)
Arm D: B4489 Swansea Road						
Flow	454.6	491.9	37.3 (8.2%)	454.6	495.2	40.6 (8.9%)
Delay	6.9	13.9	7.0 (101.1%)	7.0	17.0	10.0 (141.2%)
Mean Queue	0.8	1.8	1.0 (132.8%)	0.8	2.2	1.4 (184.4%)
Speed	23.0	19.5	-3.6 (-15.4%)	22.8	18.9	-3.9 (-17.1%)
Arm E: A48 West						
Flow	262.9	387.8	124.9 (47.5%)	256.6	378.1	121.5 (47.4%)
Delay	20.2	26.6	6.3 (31.2%)	18.9	22.5	3.6 (19.1%)
Mean Queue	1.1	1.6	0.5 (52.1%)	0.9	1.4	0.4 (47.6%)
Speed	37.5	36.5	-1.0 (-2.7%)	38.6	37.6	-0.9 (-2.4%)
Arm F: M4 West						
Flow	420.3	420.1	-0.1 (0.0%)	419.5	416.5	-3.0 (-0.7%)
Delay	7.1	9.1	2.0 (27.8%)	7.0	8.7	1.8 (25.2%)
Mean Queue	0.8	0.9	0.1 (14.8%)	0.8	0.9	0.1 (11.2%)
Speed	54.7	52.3	-2.5 (-4.5%)	54.9	52.8	-2.0 (-3.7%)

Table 10: Junction Statistics | M4 Junction 46 | PM Peak Period

Statistic	2027 Do Minimum	2027 With Dev Mitigation	Absolute Change (% Change)	2037 Do Minimum	2037 With Dev Mitigation	Absolute Change (% Change)
Arm A: B4489 North						
Flow	139.7	137.7	-2.0 (-1.4%)	139.7	139.3	-0.4 (-0.3%)
Delay	3.4	3.8	0.4 (12.1%)	3.5	3.6	0.2 (5.3%)
Mean Queue	0.2	0.2	0.0 (11.2%)	0.2	0.1	-0.1 (-38.4%)
Speed	38.6	37.6	-1.0 (-2.5%)	38.3	37.8	-0.5 (-1.3%)
Arm B: M4 East						
Flow	375.8	430.8	55.0 (14.6%)	376.1	425.2	49.1 (13.1%)
Delay	6.8	8.6	1.8 (26.6%)	7.0	8.5	1.6 (22.4%)
Mean Queue	0.7	0.8	0.1 (13.2%)	0.7	0.8	0.1 (8.4%)
Speed	52.9	50.0	-2.9 (-5.5%)	52.6	50.2	-2.4 (-4.5%)
Arm C: A48 Southeast						
Flow	923.7	957.6	33.9 (3.7%)	923.2	956.3	33.1 (3.6%)
Delay	4.0	6.0	2.0 (50.3%)	4.0	6.0	2.0 (49.4%)
Mean Queue	0.7	1.0	0.3 (39.5%)	0.7	1.0	0.2 (31.4%)
Speed	30.4	25.1	-5.3 (-17.4%)	30.5	25.4	-5.1 (-16.7%)
Arm D: B4489 Swansea Road						
Flow	468.7	498.0	29.3 (6.3%)	469.0	505.3	36.4 (7.8%)
Delay	22.4	88.0	65.6 (292.5%)	23.6	119.7	96.0 (406.1%)
Mean Queue	2.9	12.3	9.4 (329.6%)	3.0	16.8	13.8 (456.2%)
Speed	17.3	11.1	-6.2 (-35.7%)	17.1	11.0	-6.1 (-35.5%)
Arm E: A48 West						
Flow	167.4	286.8	119.4 (71.3%)	167.3	289.2	121.9 (72.8%)
Delay	15.9	17.1	1.3 (7.9%)	15.6	17.6	2.0 (13.0%)
Mean Queue	0.8	1.0	0.2 (30.7%)	0.8	1.0	0.3 (36.1%)
Speed	39.9	39.0	-0.9 (-2.3%)	40.3	38.8	-1.5 (-3.7%)
Arm F: M4 West						
Flow	337.5	336.0	-1.5 (-0.4%)	337.5	336.6	-0.9 (-0.3%)

Statistic	2027 Do Minimum	2027 With Dev Mitigation	Absolute Change (% Change)	2037 Do Minimum	2037 With Dev Mitigation	Absolute Change (% Change)
Delay	7.5	9.2	1.7 (22.8%)	7.8	8.9	1.2 (15.2%)
Mean Queue	0.8	0.8	0.1 (9.4%)	0.8	0.8	0.0 (5.0%)
Speed	54.0	51.9	-2.1 (-3.8%)	53.6	52.2	-1.4 (-2.6%)

3.4.3 Penllergaer Business Park Roundabout

Table 11: Junction Statistics | Penllergaer Business Park Roundabout | AM Peak Period

Statistic	2027 Do Minimum	2027 With Dev Mitigation	Absolute Change (% Change)	2037 Do Minimum	2037 With Dev Mitigation	Absolute Change (% Change)
Arm A: A48 East						
Flow	270.4	394.2	123.7 (45.8%)	270.5	391.1	120.7 (44.6%)
Delay	1.8	3.5	1.7 (93.9%)	1.8	3.3	1.5 (82.9%)
Mean Queue	0.0	0.2	0.2 (N/A)	0.0	0.0	0.0 (N/A)
Speed	48.5	39.9	-8.6 (-17.7%)	48.5	40.5	-8.0 (-16.5%)
Arm B: Penllergaer Business Park						
Flow	3.1	137.6	134.5 (4292.6%)	3.1	137.2	134.0 (4277.7%)
Delay	1.1	1.2	0.1 (7.8%)	1.0	1.2	0.2 (19.7%)
Mean Queue	0.0	0.0	0.0 (N/A)	0.0	0.0	0.0 (N/A)
Speed	39.5	38.5	-1.1 (-2.7%)	40.0	38.4	-1.6 (-3.9%)
Arm C: A48 West						
Flow	266.2	406.0	139.8 (52.5%)	258.9	390.7	131.8 (50.9%)
Delay	2.9	3.9	1.0 (33.5%)	2.9	3.8	0.9 (30.5%)
Mean Queue	0.0	0.1	0.1 (N/A)	0.0	0.1	0.1 (N/A)
Speed	49.4	45.1	-4.3 (-8.6%)	49.3	45.2	-4.0 (-8.2%)

Table 12: Junction Statistics | Penllergaer Business Park Roundabout | PM Peak Period

Statistic	2027 Do Minimum	2027 With Dev Mitigation	Absolute Change (% Change)	2037 Do Minimum	2037 With Dev Mitigation	Absolute Change (% Change)
Arm A: A48 East						
Flow	302.1	422.4	120.3 (39.8%)	302.1	424.3	122.2 (40.4%)
Delay	1.8	3.0	1.3 (72.1%)	4.3	9.7	5.4 (127.1%)
Mean Queue	0.0	0.1	0.1 (N/A)	0.2	0.7	0.5 (335.9%)
Speed	49.4	42.4	-7.0 (-14.1%)	48.7	41.3	-7.4 (-15.2%)
Arm B: Penllergaer Business Park						
Flow	15.5	148.8	133.3 (861.6%)	15.5	142.8	127.3 (822.8%)
Delay	1.2	1.3	0.0 (2.6%)	1.8	7.1	5.3 (299.6%)
Mean Queue	0.0	0.0	0.0 (N/A)	0.0	0.2	0.2 (22133.3%)
Speed	38.3	37.7	-0.6 (-1.7%)	38.1	36.6	-1.5 (-3.9%)
Arm C: A48 West						
Flow	135.2	264.1	129.0 (95.4%)	135.1	262.7	127.6 (94.4%)
Delay	2.2	3.3	1.1 (48.7%)	2.2	3.3	1.0 (47.4%)
Mean Queue	0.0	0.1	0.1 (N/A)	0.0	0.1	0.1 (N/A)
Speed	49.2	44.8	-4.4 (-8.9%)	49.2	45.0	-4.2 (-8.6%)

3.4.4 A48 Clasemont Road / Pant Lasau Road

Table 13: Junction Statistics | A48 Clasemont Road / Pant Lasau Road | AM Peak Period

Statistic	2027 Do Minimum	2027 With Dev Mitigation	Absolute Change (% Change)	2037 Do Minimum	2037 With Dev Mitigation	Absolute Change (% Change)
Arm A: Pant Lasau Road						
Flow	349.7	349.6	-0.1 (0.0%)	349.5	349.3	-0.3 (-0.1%)
Delay	16.3	19.2	2.9 (17.7%)	16.5	35.3	18.8 (114.4%)
Mean Queue	1.3	1.6	0.3 (21.1%)	1.4	1.5	0.2 (11.3%)
Speed	31.1	28.8	-2.3 (-7.5%)	31.1	29.8	-1.3 (-4.2%)
Arm B: Clasemont Road East						
Flow	392.8	429.3	36.5 (9.3%)	392.8	427.7	34.8 (8.9%)
Delay	7.6	10.2	2.6 (34.5%)	6.9	8.8	1.9 (28.2%)
Mean Queue	0.7	1.1	0.4 (51.9%)	0.6	0.9	0.3 (43.6%)
Speed	26.1	25.1	-1.0 (-4.0%)	26.4	25.5	-0.9 (-3.3%)
Arm C: Clasemont Road West						
Flow	1,039.9	1,075.0	35.1 (3.4%)	1,037.0	1,071.3	34.3 (3.3%)
Delay	4.7	5.0	0.3 (5.7%)	4.5	4.7	0.2 (4.2%)
Mean Queue	1.0	1.3	0.2 (20.9%)	1.1	1.2	0.0 (3.5%)
Speed	25.7	25.5	-0.2 (-0.8%)	25.8	25.7	-0.1 (-0.3%)

Table 14: Junction Statistics | A48 Clasemont Road / Pant Lasau Road | PM Peak Period

Statistic	2027 Do Minimum	2027 With Dev Mitigation	Absolute Change (% Change)	2037 Do Minimum	2037 With Dev Mitigation	Absolute Change (% Change)
Arm A: Pant Lasau Road						
Flow	577.5	578.4	0.9 (0.2%)	577.2	573.8	-3.4 (-0.6%)
Delay	8.4	12.9	4.5 (54.2%)	8.4	12.5	4.1 (48.3%)
Mean Queue	0.9	1.5	0.6 (73.5%)	0.9	1.4	0.6 (63.5%)
Speed	38.6	33.7	-5.0 (-12.8%)	38.6	34.2	-4.5 (-11.6%)
Arm B: Clasemont Road East						
Flow	458.8	488.1	29.3 (6.4%)	458.6	492.4	33.9 (7.4%)
Delay	12.7	26.7	14.1 (111.1%)	12.2	25.0	12.9 (105.5%)
Mean Queue	1.4	3.5	2.1 (144.7%)	1.4	3.3	1.9 (138.8%)
Speed	23.5	20.0	-3.5 (-15.0%)	23.5	20.1	-3.4 (-14.6%)
Arm C: Clasemont Road West						
Flow	627.9	663.6	35.7 (5.7%)	628.4	661.7	33.4 (5.3%)
Delay	3.6	3.6	0.0 (-1.0%)	3.5	3.7	0.2 (5.7%)
Mean Queue	1.0	1.1	0.1 (8.9%)	1.0	0.9	0.0 (-4.8%)
Speed	28.6	28.7	0.1 (0.4%)	28.6	28.5	-0.2 (-0.5%)

3.4.5 Analysis of Junction Statistics

3.4.5.1 M4 Junction 47 Penllergaer Interchange

Whilst an increase in flow is predicted on some arms of the junction, in particular the A48 East, this is not predicted to give rise a noticeable increase in mean queueing or delay. In all cases, any increase in delay is less 25s and any increase in queueing is less than two vehicles. In general, the results show significant decreases in delay of up to 431s and decreases in mean queue of up to 28 vehicles with the proposed development and mitigation in place compared to the Do Minimum scenario. These benefits are due to the proposed mitigation scheme adding capacity at the junction.

3.4.5.2 M4 Junction 46

Whilst an increase in flow is predicted on some arms of the junction, in particular the A48 West, this is not predicted to give rise to a noticeable increase in mean queuing or delay. In most cases, any increase in delay is less than 30s and any increase in queueing is less than three vehicles. Notwithstanding this, the B4489 results show a larger increase in delay of 96s in the 2037 PM peak, however this equates to an increase in mean queue of only 14 vehicles.

3.4.5.3 Penllergaer Business Park

Whilst an increase in flow is predicted on all arms of the junction as a result of the proposed development, this is not predicted to give rise to a noticeable increase in mean queuing or delay. In all cases, any increase in delay is less than 6s and any increase in queueing is less than one vehicle.

3.4.5.4 A48 Clasemont Road / Pant Lassau Road

Whilst an increase in flow is predicted on the A48 Clasemont Road, this is not predicted to give rise to a noticeable increase in mean queuing or delay. In all cases, any increase in delay is less than 20s and any increase in queueing is less than two vehicles.

4 Summary and Conclusion

4.1 Introduction

Stantec has been appointed by Stoford Properties Ltd to undertake Aimsun modelling in support of a planning application for proposals to provide a distribution centre on Land at Penllergaer Business Park, Swansea.

The proposed development will accommodate a floor area of 12,465sqm, located within Penllergaer Business Park, with vehicular access provided from the A48 as outlined within the Transport Assessment. This report has detailed the sensitivity test as requested by Swansea City & County Council.

4.2 Future Year Modelling

The following scenarios have been modelled:

- 2027/2037 Do Minimum: Base traffic + Consented committed developments.
- 2027/2037 With Development Mitigation: Base traffic + Consented committed developments + Proposed development (including warehouse staff) + Mitigation

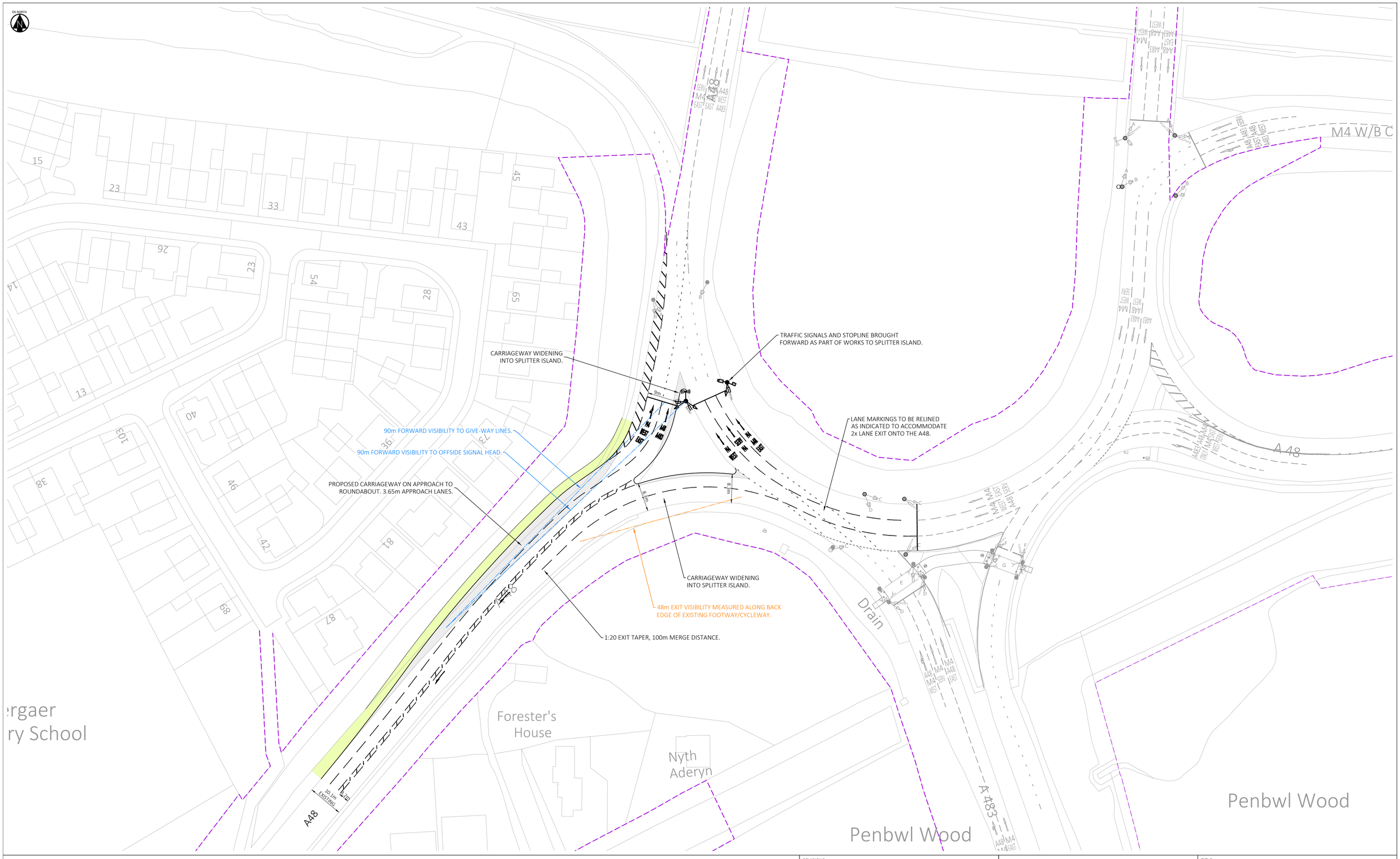
4.3 Conclusion

The modelling demonstrates that even in the unlikely scenario of a warehouse shift changeover occurring during the peak highway hour the development can be mitigated with the proposed highway mitigation scheme. The proposed mitigation is predicted to lead to significant decreases in queueing, delay and journey times which leads to an overall general betterment of the network compared to the Do Minimum scenario.

The development would not therefore give rise to impacts that are considered to be severe and the proposed mitigation ensures the development provides a betterment to the existing highway network.

Appendix F

Mitigation Measures M4 Junction 47-A48: Option B



NOTES:
1. DO NOT SCALE FROM THIS DRAWING.
2. THE CURRENT DESIGN HAS BEEN BASED ON ORDNANCE SURVEY MAPPING.
3. THE DESIGN PROPOSAL IS IN ACCORDANCE WITH THE FOLLOWING DMRB DOCUMENTS:
   3.1. CD 109 HIGHWAY LINK DESIGN
   3.2. CD 116 GEOMETRIC DESIGN OF ROUNDABOUTS

VISIBILITY CRITERIA:
FORWARD VISIBILITY ON ENTRY
A48 ARM.
SPEED LIMIT IS 30mph.
DESIGN SPEED 30mph / 60kph (DMRB CD 109).
DESIRABLE MINIMUM 90m STOPPING SIGHT DISTANCE HAS BEEN SHOWN.

EXIT VISIBILITY AT EXIT
A48 ARM
SPEED LIMIT IS 30mph.
DESIGN SPEED 30mph / 48kph (DMRB CD 109).
DESIRABLE MINIMUM 90m IS NOT ACHIEVABLE, THEREFORE MAXIMUM.
ACHIEVABLE 48m SSD HAS BEEN SHOWN.

KEY:
- SWANSEA CITY ADOPTED HIGHWAY MAINTAINED AT THE PUBLIC EXPENSE
- PROPOSED KERB
- PROPOSED CARRIAGEWAY WIDENING
- PROPOSED VERGE

REVISIONS

DRAFT
FOR DISCUSSION ONLY

REV	DATE	DESCRIPTION	BY	CKD	APP
P01	03/02/26	FOLLOWING LHA COMMENTS, EXIT MERGE AMENDED TO START AT END OF EXIT RADIUS. CENTRAL HATCHING INCREASED TO 0.8m WIDE. NEARSIDE TAPER LANE REMOVED.	JD	RAP	RAP
P00	23/09/25	FIRST ISSUE.	JD	SW	SW

Stantec
OVER COURT BARNS
OVER LANE
ALMONDSBURY
BRISTOL
BS32 4DF
t: +44 (0) 1454 619533
e: bristol@hydrock.com

CLIENT
STOFORD PROPORTIES LTD

PROJECT
LAND AT PENLLERGAER BUSINESS PARK


TITLE
JUNCTION 47
A48 IMPROVEMENTS - OPTION B
GENERAL ARRANGEMENT


STANTEC PROJECT NO.	SCALE @ A1
333700855	1:500

STATUS DESCRIPTION	STATUS
INFORMATION	S2

DRAWING NO. (PROJECT CODE-ORIGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER)
333800855-STN-XX-XX-DR-D-0001

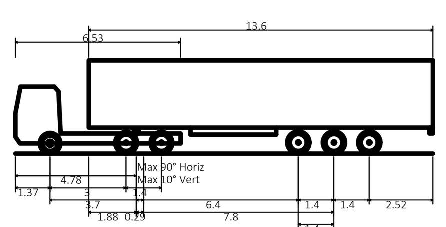
REVISION
P01





NOTES:
1. DO NOT SCALE FROM THIS DRAWING.
2. VEHICLE SWEPT PATHS BASED ON 15kph DESIGN SPEED.

DESIGN VEHICLE PROFILE:



Max Legal Length (UK) Articulated Vehicle (16.5m)	
Overall Length	16.500m
Overall Width	2.550m
Overall Body Height	3.681m
Min Body Ground Clearance	0.411m
Max Track Width	2.500m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	6.530m

REVISIONS

DRAFT
FOR DISCUSSION ONLY

REV	DATE	DESCRIPTION	BY	CKD	APP
P01	03/02/26	HIGHWAY LAYOUT UPDATED, REFER TO GENERAL ARRANGEMENT FOR DETAILS. SWEPT PATHS UPDATED TO SUIT.	JD	RAP	RAP
P00	23/09/25	FIRST ISSUE.	JD	SW	SW

Stantec

OVER COURT BARNS
OVER LANE
ALMONDSBURY
BRISTOL
BS32 4DF
t: +44 (0) 1454 619533
e: bristol@hydrock.com

CLIENT
STOFORD PROPORTIES LTD

PROJECT
LAND AT PENLLERGAER BUSINESS PARK

TITLE
JUNCTION 47
A48 IMPROVEMENTS - OPTION B
SWEPT PATH ANALYSIS

STANTEC PROJECT NO. 333700855

SCALE @ A1 1:500

STATUS DESCRIPTION INFORMATION

STATUS S2

DRAWING NO. (PROJECT CODE-ORIGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER) 333800855-STN-XX-XX-DR-D-0002

REVISION P01

With every community, we redefine what's possible.

Stantec is a global leader in sustainable engineering, architecture, and environmental consulting. The diverse perspectives of our partners and interested parties drive us to think beyond what's previously been done on critical issues like climate change, digital transformation, and future-proofing our cities and infrastructure. We innovate at the intersection of community, creativity, and client relationships to advance communities everywhere, so that together we can redefine what's possible.

Stantec UK Limited
Wharton Place, 13 Wharton Street
Cardiff
CF10 1GS
UNITED KINGDOM
stantec.com