# TRANSPORT IMPLEMENTATION STRATEGY

**Project Title:** Land at Model Farm, Rhoose, PBPC

**Report Reference:** JNY9624-10A

**Date:** 11 March 2021

## Introduction

1.1 This revised Transport Implementation Strategy (TIS) has been prepared by RPS to support an outline planning application for an employment development at Model Farm, Rhoose (Parc Busnes Porth Cymru, hereafter referred to as PBPC).

1.2 PBPC forms part of the Cardiff Airport and Bro Tathan Enterprise Zone (EZ) (formerly named the Cardiff Airport and St Athan Enterprise Zone), which is located to the west of Barry in the Vale of Glamorgan.

1.3 A Transport Assessment (TA) (RPS Report Ref JNY9624-04B) was prepared in support of the planning application and incorporated a TIS at Section 10.

1.4 Following discussions with the Vale of Glamorgan Council (VoGC), and the changes in future year transport infrastructure since the preparation of the TA, the TIS was updated and expanded upon (RPS Report Ref JNY9624-08B) to set out the transport measures associated with PBPC to accommodate its travel demand and achieve the mode shift set out in the TA along with the trigger points for their implementation.

1.5 Subsequent to the submission of the updated TIS (RPS Report Ref JNY9624-08B), a meeting was held with VoGC on 11th January 2021 and it was agreed that this Revised TIS should be prepared.

1.6 In order to define the scope for the Revised TIS a Scoping Note was prepared and discussed during a meeting with VoGC on 11th February 2021. It was agreed that no changes to the transport assumptions would be made unless there was evidence to support it and the assumptions within the Scoping Note were agreed.

1.7 Details of the existing transport situation is attached at Appendix A and details of the future baseline transport situation is attached at Appendix B. The travel demand of PBPC is attached at Appendix C.

1.8 The Indicative Concept Masterplan and Movement and Access Parameter Plan are attached at Appendix D.

# Transport Implementation Strategy

## Site Access and Sustainable Transport Proposals

1.9 Transport proposals have been developed to maximise the potential of sustainable travel modes other than private car journeys, limiting the potential traffic impacts that may arise from the development. The proposals consist of the following measures:

- Framework Travel Plan (FTP);
- Walking and Cycling Strategy;
- Public Transport Strategy;
- Vehicular Access Strategy; and
- Car Parking Management Plan (CPMP).
- Draft Framework Travel Plan

1.10 An FTP for the scheme has been developed in accordance with the appropriate National and Local policy guidance. The FTP has been written in accordance with a Scoping Report submitted to VoGC and TfW in November 2018 and April 2019. The plan will be implemented site-wide prior to occupation.

1.11 Aims and objectives set out within the FTP will be achieved through the implementation of measures, initiatives and marketing that are aimed at decreasing single occupancy vehicle use and increasing use of sustainable travel modes.

## Site Layout

1.12 The Indicative Concept Masterplan and Movement and Access Parameter Plan are attached at Appendix D. One side of the spine road is proposed to be a footway, with the other side proposed as a shared cycleway / footway.

1.13 The internal walking and cycling routes will include dropped kerbs, pedestrian refuges (if and where required) and lighting. This will establish a safe environment for pedestrians and cyclists.

1.14 Pedestrian and cycle links will be provided to the existing PRoW footpath P4 17/1 and NCN 88 route within the vicinity of the site, as shown on the Movement and Access Parameter Plan at Appendix D. This PRoW and cycle route form links to and from key origin destinations and public transport hubs.

1.15 The Movement and Access Parameter Plan also shows that the footway and cycleways will link onto routes within Porthkerry Country Park to the east of the site. Access to Barry is provided through this Park, with footpaths and NCN 88 maintained by TVoGC and Welsh Government respectively.

1.16 The Movement and Access Parameter Plan shows that provision is made for an active travel route along the northern boundary of the site.

1.17 Provision is made within the red line application boundary for a public transport corridor between the existing railway to the south and Cardiff airport.

1.18 Bus penetration is proposed for the site, with bus stops to be strategically placed in the detailed design stage. This will increase accessibility to the maximum number of users, in order for full

advantage of bus penetration to be taken. Raised kerbs will also be provided at the stops, making the service accessible to all users.

1.19 The speed limit of vehicles within the site will be set at 20mph. This will have road safety benefits, as well as encouraging more physical activity, such as walking and cycling, by contributing towards a safer environment. Traffic calming measures, such as raised zebra crossings across speed tables, will also be considered.

1.20 Traffic Regulation Orders (TRO) of double yellow lines will be implemented along the internal spine road and the access roads to buildings. This will prevent overspill parking and limit the number of vehicles accessing the site.

## Walking and Cycling Strategy

1.21 High priority has been given to walking and cycling within the design of the proposed illustrative masterplan (Appendix D) and is set out below.

### Walking

1.22 Walking distances and times are shown in the isochrone maps provided in Figure 3, Figure 4 and Figure 5 of the TA. Showering and changing facilities will also be provided by businesses to their employees.

1.23 As shown on the Movement and Access Parameter Plan (Appendix D), walking links will be provided to the bus stops on Port Road along with associated improvements to those bus stops and this will provide a means of sustainable access to PBPC from Barry whilst travel demand is in its infancy.

1.24 As shown in Table C4, travel demand on foot is low during early build out years. Travel demand on foot will primarily be from Barry and Rhoose, which already has footway links to PBPC. Off-site provision along Port Road West will provide a walking route into Barry, which is an aspiration for VoGC and forms part of Policy MG16 of the Vale of Glamorgan Local Development Plan 2011 to 2026.

1.25 It is considered reasonable that an active travel route along Port Road West should be provided at the end of year 1 once travel demand on foot from Barry is established. From the build out in Table C1, this equates to approximately 20,000 $m^2$ GFA. A concept design for this active travel route has been completed and it will be delivered in collaboration with VoGC. The applicant has safeguarded land for part of this route.

### Cycling

1.26 A shared cycleway / footway is to be provided as part of the internal spine road of the site and connect to the existing highway network at two different cycle accesses. As shown on the Movement and Access Parameter Plan (Appendix D), one access will provide a link to NCN 88, the existing footway / cycleway onto Rhoose and through to Barry and another will link onto Port Road West.

1.27 Off-site provision along Port Road West will provide a cycling route into Barry, which has been an aspiration for VoGC and forms part of Policy MG16 of the Vale of Glamorgan Local Development Plan 2011 to 2026.

1.28 This should tie in with the provision of the walking route along Port Road West to provide a compliant active travel route and should be provided by the end of year 1.

1.29 Cycling distances and times are shown in the isochrone map provided in Figure 6 of the TA. Secure, covered cycle parking spaces, showering and changing facilities will also be provided by businesses to their employees.

1.30 Cycle parking will be provided in accordance with VoGC Parking Standards SPG. Cycle parking is expected to be provided above the suggested levels in order to maximise the number of employees that may cycle to work.

## Public Transport Strategy

### Bus Services

1.31 The site is currently accessible via a number of bus services from key destinations of Rhoose, Barry, Llantwit Major, Bridgend and Cardiff. The nearest existing bus stops to the site are within reasonable walking distance. VoGC have been receiving contributions from developers for the improvement of sustainable transport services.

1.32 In preparing the TA (pre-pandemic), the VoGC Group Manager Transport Services advised that, irrespective of PBPC, the number 905 bus service may be retired and incorporated into the number 303 route with its proposed increased frequency of two per hour to meet the improved train frequency service.

1.33 The Group Manager Transport Services also advised that the number 303 bus service could in turn penetrate the development and connect PBPC with Cardiff International Airport, Barry and Rhoose (CIA) Rail Station (with an improved 30-minute frequency to match the 2022/2023 improved rail service). The T9 bus service could form the basis of a good bus connection with Cardiff. The applicant / developer would provide the on-site infrastructure as part of the build out of the site.

1.34 Chosen existing bus stops on Port Road will also be upgraded through mitigation to include raised kerbs, shelter, seating and timetable information. This will be provided from the outset prior to any occupation of development and would be the responsibility of the applicant / developer.

1.35 In order to assess bus requirements at PBPC, a number of considerations and assumptions have been made based upon the provisions pre-pandemic, as attached at Appendix E. Based on these assumptions, the focus is on the number 303 bus service. RPS understands each bus has 40 seats and it generally operates at approximately half capacity. With an hourly service in each direction (i.e. two buses per hour), this means there is a capacity of 80 seats per hour and availability of 40 seats per hour.

1.36 From the cumulative additional bus passengers in Table C4, this means that the available capacity would be reached at the end of year two. From the build out in Table C1, this equates

to approximately 40,000 m2 GFA whereby an initial improvement to bus services would be required.

1.37 At this point, if the number 303 bus service was improved to two services per hour (one bus per 30 minutes), this means, there would be an additional 80 seats. Excluding PBPC, this level of service is equivalent to 120 available seats per hour based upon current demand.

1.38 From the cumulative additional bus passengers in Table C4, this means that the revised available capacity would be reached at the end of year seven. From the build out in Table C1, this equates to approximately 120,000 m2 GFA whereby the final improvement to bus services would be required.

1.39 At this point, if the number 303 bus service was improved to three services per hour (one bus per 20 minutes), this means, there would be an additional 160 seats. Excluding PBPC, this level of service is equivalent to 200 available seats per hour based upon current demand.

1.40 From the cumulative additional bus passengers in Table C4, this level of service would cater for the bus demand generated by the completed PBPC.

1.41 As set out above, these triggers do not mean that seats would be unavailable, however, it strikes a balance between seating capacity, all services to all key origin destinations and attractiveness.

1.42 Mindful of the wider EZ and a need to consider coherent and integrated bus service provisions across all of the Vale, these would be delivered in collaboration with VoGC and key stakeholders.

### Train Services

1.43 Barry Rail Station benefits from frequent train services from key origin destinations. The suggested pedestrian infrastructure mitigation would provide improved routes to and from the station and the development for those walking and cycling.

1.44 Rhoose (CIA) Rail Station currently has a frequency of one arrival and departure per hour. Transport for Wales (TfW) have committed to increasing the service from one train per hour to two trains per hour (half-hourly) in 2022/23.

1.45 The additional rail patronage set out in Table C4 is such that demand will not affect its capacity. No improvements by PBPC are therefore proposed.

1.46 Provision is made within the red line application boundary for a public transport corridor between the existing railway to the south and Cardiff airport.

## Vehicular Parking Strategy

1.47 Vehicle parking will be provided generally in line with VoGC Parking Standards SPG document. However, parking will be suppressed to encourage travel by alternative, sustainable modes. The exact number of parking spaces will be agreed with VoGC at the reserved matters stage of the application. As per PPW 10 para 4.1.51 ‘Planning authorities must support schemes which keep parking levels down’.

1.48 COVID-19 has radically changed how we work. This is likely to be a long term change. With less time spent in the office and more time spent working from home all journeys to work including by car will be reduced.

1.49 Parking Management plans will be introduced to restrict parking levels. Schemes such as prioritising parking spaces for those that car-share and electric vehicles will be implemented.

1.50 Traffic Regulation Orders (TROs), such as double yellow lines, will be implemented along the internal spine and access roads to prevent overspill parking.

## Vehicular Access Strategy

### Site Access

1.51 It is proposed that the development is accessed from two points from the existing highway network. There will be one access in the north of the development, served by the addition of a fourth arm to the existing Port Road and A4226 three arm roundabout. The second access will be in the south of the site, from the unnamed road serving the Holiday Inn Express which is accessed from the Port Road, CIA access and unnamed road roundabout. These will form part of the site infrastructure as part of the site build out.

### Off-Site Highways

1.52 As set out at Appendix B, ARCADY operational assessments have been undertaken for the weekday AM and PM peak hours using the 2026 traffic flow scenarios set out in the TA with a 30% reduction in commuting traffic flows. These have been expanded upon below to include the scenarios with the addition of PBPC.

1.53 The scenarios included in Table 1 are:

- 2026 base;
- 2026 base plus the expected build out of PBPC in 2026 (82,489m² GFA);
- 2026 base plus the build out of PBPC that would result in capacity being reached (171,890m² GFA); and
- 2026 base plus the full build out of PBPC (189,725m² GFA).

1.54 A summary of the results is set out in Table 1 and full print outs are attached at Appendix F.

**Table 1: Summary of ARCADY Operational Assessments at the Waycock Cross Roundabout**

| 2026 Base | | | | | | |
|---|---|---|---|---|---|---|
| **Arm** | **AM Peak Hour 07:45 – 08:45** | | | **PM Peak Hour 16:30 – 17:30** | | |
| | **Max Queue (Vehicles)** | **Max Delay (Seconds)** | **Max RFC** | **Max Queue (Vehicles)** | **Max Delay (Seconds)** | **Max RFC** |
| Port Road West | 3.5 | 13.93 | 0.78 | 2.1 | 8.99 | 0.68 |
| Waycock Road (Five Mile Lane) | 0.8 | 3.92 | 0.45 | 1.1 | 4.37 | 0.54 |
| Port Road West (e) | 0.6 | 5.41 | 0.37 | 0.6 | 5.33 | 0.36 |
| Pontypridd Road | 1.2 | 5.45 | 0.55 | 1.1 | 5.28 | 0.52 |
| **2026 Base plus expected build out of PBPC in 2026 (82,489m² GFA)** | | | | | | |
| **Arm** | **AM Peak Hour 07:45 – 08:45** | | | **PM Peak Hour 16:30 – 17:30** | | |
| | **Max Queue (Vehicles)** | **Max Delay (Seconds)** | **Max RFC** | **Max Queue (Vehicles)** | **Max Delay (Seconds)** | **Max RFC** |
| Port Road West | 4.1 | 15.5 | 0.81 | 4.2 | 14.64 | 0.81 |
| Waycock Road (Five Mile Lane) | 0.9 | 4.14 | 0.48 | 1.1 | 4.59 | 0.53 |
| Port Road West (e) | 0.9 | 6.62 | 0.47 | 0.6 | 5.45 | 0.38 |
| Pontypridd Road | 1.4 | 6.78 | 0.59 | 0.9 | 4.77 | 0.47 |
| **2026 Base plus the build out of PBPC that would result in capacity being reached (171,890m² GFA)** | | | | | | |
| **Arm** | **AM Peak Hour 0:;45 – 08:45** | | | **PM Peak Hour 16:30 – 17:30** | | |
| | **Max Queue (Vehicles)** | **Max Delay (Seconds)** | **Max RFC** | **Max Queue (Vehicles)** | **Max Delay (Seconds)** | **Max RFC** |
| Port Road West | 5.7 | 20.44 | 0.86 | 23.4 | 65.28 | 0.99 |
| Waycock Road (Five Mile Lane) | 1.3 | 5.04 | 0.57 | 1.3 | 5.29 | 0.57 |
| Port Road West (e) | 1.8 | 10.48 | 0.64 | 0.7 | 6.92 | 0.42 |
| Pontypridd Road | 2.5 | 11.14 | 0.72 | 0.9 | 4.97 | 0.48 |
| **2026 Base plus the full build out of PBPC (189,725m² GFA)** | | | | | | |
| **Arm** | **AM Peak Hour 07:45 – 08:45** | | | **PM Peak Hour 16:30 – 17:30** | | |
| | **Max Queue (Vehicles)** | **Max Delay (Seconds)** | **Max RFC** | **Max Queue (Vehicles)** | **Max Delay (Seconds)** | **Max RFC** |
| Port Road West | 6.1 | 21.8 | 0.87 | 39.5 | 98.73 | 1.03 |
| Waycock Road (Five Mile Lane) | 1.5 | 5.29 | 0.59 | 1.3 | 5.39 | 0.57 |
| Port Road West (e) | 2.1 | 11.85 | 0.68 | 0.7 | 5.92 | 0.42 |
| Pontypridd Road | 2.9 | 12.95 | 0.75 | 0.9 | 5 | 0.48 |

1.55 As can be seen, Waycock Cross is predicted to operate within capacity under 2026 base conditions. A maximum RFC of 0.78 is predicted on Port Road West during the AM peak hour with an associated queue length of 4 vehicles. During the PM peak hour, a maximum RFC of 0.68 is predicted on Port Road West with an associated queue length of 3 vehicles.

1.56 Following the addition of PBPC full development (189,725m²) in 2026 (without having regard to a build out that would extend beyond 2026), Waycock Cross is predicted to operate within capacity during the AM peak hour and in excess of capacity during the PM peak hour. All capacity considerations are limited to the Port Road West arm during the PM peak hour only.

1.57 Based upon this, during the PM peak hour, the addition of the entirety of PBPCs traffic would cause Waycock Cross to go from operating within capacity to operating in excess of capacity. Therefore, a proportion of PBPC would cause Waycock Cross to go from operating within capacity to the point of operating at / in excess of capacity. That proportion equates to a GFA of approximately 170,000m$^2$ at PBPC.

1.58 It should be noted that these assessments are based upon a 2026 future year, which is the end of the Local Plan period. The traffic flows assume a full build out of PBPC by 2026 (which is not expected) and a full build out of all other allocated sites (which is also not expected). The 2026 traffic flows can therefore be considered to be an overestimate.

1.59 The assessments predict that a GFA of 170,000m$^2$ could be built out at PBPC before capacity of the Waycock Cross roundabout would be exceeded. Based upon the potential build out rate of PBPC, this would not in fact be until 2033.

1.60 It is expected that a GFA of 82,489m² could be built out at PBPC by 2026. Based upon this, Table 1 shows that the Waycock Cross roundabout would operate within capacity during the AM peak hour and PM peak hours in 2026.

1.61 The VoGC have an aspiration of providing a left turn slip on Port Road West in conjunction with the EZ. The provision of this would improve the performance of Weycock Cross accordingly. Although an aspiration of VoGC, the applicant is not aware of a design scheme or any funding, although as part of their aspiration. This would be delivered in collaboration with VoGC.

### Sensitivity Test

1.62 As agreed with VoGC and detailed at Appendix B, ARCADY operational assessments have also been undertaken for the AM and PM peak hours using the traffic flows set out in the TA with a 20% reduction in commuting traffic flows applied.

1.63 The same scenarios as above have been assessed with a summary of the results set out in Table 2 and full print outs are attached at Appendix F.

**Table 2: Summary of ARCADY Operational Assessments at the Waycock Cross Roundabout - Sensitivity**

| 2026 Base | | | | | | |
|---|---|---|---|---|---|---|
| Arm | AM Peak Hour 07:45 – 08:45 | | | PM Peak Hour 16:30 – 17:30 | | |
| | Max Queue (Vehicles) | Max Delay (Seconds) | Max RFC | Max Queue (Vehicles) | Max Delay (Seconds) | Max RFC |
| Port Road West | 4.2 | 16.24 | 0.81 | 2.5 | 10.22 | 0.72 |
| Waycock Road (Five Mile Lane) | 0.9 | 4.09 | 0.47 | 1.3 | 4.7 | 0.56 |
| Port Road West (e) | 0.6 | 5.67 | 0.39 | 0.6 | 5.64 | 0.38 |
| Pontypridd Road | 1.3 | 5.74 | 0.57 | 1.2 | 5.72 | 0.55 |
| **2026 Base plus expected build out of PBPC in 2026 (82,489m² GFA)** | | | | | | |
| Arm | AM Peak Hour 07:45 – 08:45 | | | PM Peak Hour 16:30 – 17:30 | | |
| | Max Queue (Vehicles) | Max Delay (Seconds) | Max RFC | Max Queue (Vehicles) | Max Delay (Seconds) | Max RFC |
| Port Road West | 5 | 18.49 | 0.84 | 5.4 | 18.29 | 0.85 |
| Waycock Road (Five Mile Lane) | 1 | 4.33 | 0.5 | 1.3 | 4.96 | 0.56 |
| Port Road West (e) | 1 | 7.01 | 0.49 | 0.7 | 5.85 | 0.4 |
| Pontypridd Road | 1.6 | 7.26 | 0.62 | 1 | 5.14 | 0.5 |
| **2026 Base plus the build out of PBPC that would result in capacity being reached (152,716m² GFA)** | | | | | | |
| Arm | AM Peak Hour 0:;45 – 08:45 | | | PM Peak Hour 16:30 – 17:30 | | |
| | Max Queue (Vehicles) | Max Delay (Seconds) | Max RFC | Max Queue (Vehicles) | Max Delay (Seconds) | Max RFC |
| Port Road West | 6.7 | 23.95 | 0.88 | 23.4 | 66.19 | 0.99 |
| Waycock Road (Five Mile Lane) | 1.3 | 5.07 | 0.57 | 1.4 | 5.59 | 0.59 |
| Port Road West (e) | 1.6 | 9.92 | 0.62 | 0.8 | 6.17 | 0.43 |
| Pontypridd Road | 2.4 | 10.66 | 0.71 | 1 | 5.3 | 0.51 |
| **2026 Base plus the full build out of PBPC (189,725m² GFA)** | | | | | | |
| Arm | AM Peak Hour 07:45 – 08:45 | | | PM Peak Hour 16:30 – 17:30 | | |
| | Max Queue (Vehicles) | Max Delay (Seconds) | Max RFC | Max Queue (Vehicles) | Max Delay (Seconds) | Max RFC |
| Port Road West | 8 | 28.23 | 0.9 | 60.5 | 141.62 | 1.07 |
| Waycock Road (Five Mile Lane) | 1.6 | 5.63 | 0.62 | 1.5 | 5.75 | 0.6 |
| Port Road West (e) | 2.3 | 13.21 | 0.71 | 0.8 | 6.33 | 0.45 |
| Pontypridd Road | 3.4 | 14.84 | 0.78 | 1.1 | 5.42 | 5.52 |

1.64 Under this sensitivity test, the same conclusions as above are drawn, but the GFAs relating to PBPC change. The GFA of PBPC that would cause Waycock Cross to go from operating within capacity to the point of operating at / in excess of capacity in this sensitivity scenario is approximately 150,000m$^2$.

## Summary

1.65 The development complies with the National and Local policies and provides a suitable Transport Implementation Strategy. Trigger points for additional transport infrastructure and mitigation is set out in Table 2.

**Table 2: Summary of Trigger Points for Transport Infrastructure**

| Development Build Out Trigger | Additional Transport Infrastructure and Mitigation | Delivery |
|---|---|---|
| Prior to Occupation | Existing bus stops on Port Road to be upgraded to include raised kerbs, shelter, seating and timetable information. Provide Active Travel infrastructure within the site to link to the existing bus stops and the existing Active Travel infrastructure on Port Road. | Completed by applicant / developer. |
| 20,000 m$^2$ GFA | Provision of compliant Active Travel Route along Port Road West to Barry | Aspiration for VoGC and forms part of Policy MG16 of the VoGC LDP 2011 to 2026. Concept design scheme completed. To be delivered in collaboration with VoGC. |
| 40,000 m$^2$ GFA | Initial improvement to bus services (303 bus service every 30 minutes) | Mindful of the wider EZ, to be delivered in collaboration with VoGC and other key stakeholders in conjunction with the bus operators. |
| 120,000 m$^2$ GFA | Final improvement to bus services (303 bus service every 20 minutes) | Mindful of the wider EZ, to be delivered in collaboration with VoGC and other key stakeholders in conjunction with the bus operators. |
| 170,000m$^2$ GFA | Highway Improvements to the Port Road West arm of Waycock Cross (left turn slip) | Aspiration for VoGC as part of the EZ. No design scheme or any funding. To be delivered in collaboration with VoGC. |

1.66 PBPC will comply with the policies, plans, notes and acts set out within the TA. These are:

- Planning Policy Wales (PPW) Edition 10 (2018);
- Technical Advice Note (TAN) 18: Transport (2007);
- People, Places, Futures – The Wales Spatial Plan (2008);
- Wales Transport Strategy – One Wales – Connecting the Nation (2008);
- Sustainable Development Scheme 'One Wales: One Planet' (2009);
- The National Transport Plan (2010);
- Active Travel (Wales) Act (2013);
- Vale of Glamorgan Local Transport Plan (LTP3) 2015 – 2030;

- Vale of Glamorgan Local Development Plan 2011 – 2026 (2017);
- Vale of Glamorgan Supplementary Planning Guidance - Parking Standards (2019); and
- Vale of Glamorgan Draft Supplementary Planning Guidance – Travel Plan (2018).

1.67 The site is allocated for employment and strategic development, is well located in relation to public transport opportunities (two rail stations, existing bus services) and can serve the economic needs of the Vale of Glamorgan whilst creating a strong, happy working environment.

1.68 The development has been planned with street design as a key element. The importance of pedestrian and cycling infrastructure will be incorporated within the detailed design, with a shared footway / cycleway routing along the internal spine road linking onto the existing infrastructure providing access to Rhoose and Barry.

1.69 Improvements to existing transport infrastructure and provision of future infrastructure, such as crossing locations and new walking and cycling routes provide mitigation for the scheme. Bus penetration will be provided through diversion of an existing service, with bus stops internal to the site located at appropriate walking distances.

1.70 Public transport provision will be increased with more frequent services for both bus and train services. Increases to the services will be beneficial not only to the development but to local communities. This will also be beneficial to local communities.

1.71 This strategy fulfils the Sustainable Transport Hierarchy for Planning at PPW 10 Figure 8.

1.72 Traffic management and parking restrictions will be implemented to reduce the number of single occupancy vehicle trips made to and from the site. Electric charging points will be provided with emphasis on tackling the causes of climate change. Developers will be encouraged to have electric fleet vehicles, reducing the need for private car journeys and further encouraging the reduction of carbon production.

1.73 A Framework Travel Plan (FTP) will be implemented site-wide, with a Site-Wide Travel Plan Co-ordinator (SWTPC) and Travel Plan Co-ordinators (TPCs) for the individual businesses within the development compulsory. The FTP will be written in line with VoGC's Draft Travel Plan guidance document and will inform future employees of the sustainable travel choices available to access the development, measures for healthier living that are to be provided and accessibility, timetables and discounts for public transport. Monitoring reports of the FTP will be submitted to VoGC and TfW by the SWTPC annually. Changes to the way the FTP is marketed, and the measures promoted within it will then be examined and alterations could be made if needed.

# APPENDICES

# APPENDIX A: EXISTING AND BASELINE TRANSPORT CONDITIONS

## Site Location

A.1 PBPC is located to the immediate east of Cardiff International Airport (CIA) and is bound by the A4226 to the north, Port Road to the west, agricultural fields and Porthkerry Country Park to the south and agricultural fields to the east. It is located approximately two kilometres north east of Rhoose and four kilometres west of Barry. The site in its wider geographical context can be seen in Figure 1 of the TA.

A.2 PBPC forms part of the wider EZ, which is allocated within the Vale of Glamorgan Local Development Plan 2011 – 2026 (adopted June 2017). The EZ is allocated in the Local Development Plan for 77.4ha of B1, B2 and B8 employment uses and an extension to the Porthkerry Park. The ultimate Council led vision for the wider allocation is to create an 'airport city' taking the form of a business destination for local and international businesses including quality office accommodation, specialist education, training facilities and leisure developments.

## Local Highway Network

### Port Road

A.3 Port Road routes from the north of the site to the south-west of the site along the entirety of the western site boundary. The road is an urban clearway, restricting vehicles from stopping for one and three-quarter miles, has a 50mph speed limit and is street-lit.

A.4 The road has three roundabout junctions, one simple priority junction and several private accesses. The simple priority junction serves Blackton Lane, which provides access to a small number of dwellings.

A.5 A roundabout junction with three arms connects Port Road and the A4226, at the north-eastern end of the road.

A.6 A second roundabout junction is located approximately 170 metres from the south-western end of the road. This junction has four arms which provides access to CIA and Holiday Inn Express.

A.7 A third roundabout junction is located at the south-western end of Port Road. This junction has three arms which serve Port Road, Porthkerry Road and an Unnamed Road serving Raven Express Logistics.

### A4226

A.8 The A4226 routes north-east to south-west from Barry to the north of CIA. The A4226 has four roundabout junctions along its route. There is a speed limit of 50mph from the 'Waycock Cross' roundabout to the A4226 / B4265 roundabout, with street lighting provided.

A.9 The first roundabout is in Colcot and has three arms. The roundabout serves the A4226, A4050 and Colcot Road. The A4050 is a continuation of the A4226, heading north-east towards the Culverhouse roundabout junction to the west of Cardiff.

A.10 The second roundabout is located north-west of Barry and is known as 'Waycock Cross'. The roundabout has four arms which connect the A4226, Waycock Road (Five Mile Lane) and B4266. The B4266 Pontypridd Road routes into Barry.

A.11 The third roundabout is located to the north of the site. This roundabout has three arms which serve the A4226 and Port Road.

A.12 The fourth roundabout is located north of CIA. The roundabout has five arms and serves the A4226, B4265, Tredogan Road and Dragonfly Drive. Dragonfly Drive routes south-west to airport hangers.

## Five Mile Lane

A.13 Five Mile Lane is a highway link improvement along the A4226 (Waycock Road), designed to improve access from the M4 corridor and Cardiff to Cardiff Airport Enterprise Zone, commissioned by the Welsh Government. The aim of Five Mile Lane is to improve journey time and network resilience to the EZ and to overcome congestion on Port Road.

A.14 The scheme is now complete and upgraded the road to a single lane carriageway of 7.3 metres width. The Waycock Cross roundabout was upgraded as part of the scheme, undergoing widening to two lanes on the A4226 arm with a length of unsegregated footway / cycleway.

A.15 The 'Sycamore Cross' junction is a staggered crossroad signalised junction accessed when travelling north along Five Mile Lane from the Waycock Cross roundabout, which was also upgraded as part of the scheme. The work at this junction increased capacity for turning movements at the junction, allowing for the highway improvement scheme to be maximised. The route provides access to the A48, an alternative route to the Culverhouse gyratory roundabout.

## Porthkerry Road

A.16 Porthkerry Road routes from the south-west of the site. The road begins at the roundabout junction of Port Road / Porthkerry Road / Unnamed Road (serving Raven Express Logistics) and meanders south-west towards Rhoose. The road is street-lit and subject to a 50mph speed limit.

A.17 There are four simple priority junctions on this road; two of these junctions serve unnamed roads, one serving a few dwellings and the other serving a leisure park, church and farm. One of the other junctions serves Murlande Way and the other serves Rhoose Way; both roads serve residential areas.

A.18 Porthkerry Road also has two roundabouts along its course. The first roundabout has three arms, serving Porthkerry Road and Pentir Y De. The second roundabout is located at the end of Porthkerry Road and serves Porthkerry Road, Rhoose Road and Readers Way. Rhoose Road routes into the centre of Rhoose and Readers Way provides access to a residential area.

## Tredogan Road

A.19 Tredogan Road routes from north to south from the village of Penmark to car parking areas for CIA.

### B4265

A.20 The B4265 is a continuation of the A4226 and is accessed west of the site. The road routes west through Llantwit Major and culminates in Bridgend.

## Walking and Cycling

A.21 Footways are provided on the southern section of Port Road, south of the Holiday Inn Express roundabout access, and provide access to the Holiday Inn Express bus stops. These footways connect, albeit with the need to cross Port Road twice, to the shared use cycleway on the northern side of Porthkerry Road which provides a continuous link into Rhoose. The footways are well lit.

A.22 There are no footways on the northern section of Port Road or on the A4226, to the north of the site.

A.23 There are public footpaths which connect the site to Barry as well as the Wales Coastal path, to the south of the site. This can be seen on Figure 2 of the TA. Public Right of Way (PRoW) footpath P4 17/1 provides access from the A4226 to Porthkerry Country Park and routes partially within the site, close to the eastern boundary.

A.24 National Cycle Network (NCN) route 88 can be accessed on Porthkerry Road and used to route to Barry and Llantwit Major, together with Ewenny, just to the south of Bridgend. There is also a local cycle link to the NCR from Rhoose which connects the site to the Rhoose (CIA) Railway Station, as shown on Figure 2 of the TA.

A.25 Isochrone maps showing the walking distances and times from the centre, eastern and western parts of the development have been created and are available at Figure 3, Figure 4 and Figure 5 of the TA. Distances were calculated based on 80 metres covered per minute on foot. In brief, the maps show that the site is accessible from Rhoose (CIA) Rail Station and residential areas of Rhoose and Barry within 40 minutes walking distance.

A.26 A cycle isochrone map has also been created from the centre of the site, available in Figure 6 of the TA. Distances have been calculated based on 320 metres covered per minute whilst cycling. In brief, the isochrone map shows that the development is accessible from six rail stations, the entirety of Rhoose and Barry and further afield within 25 minutes cycle distance.

## Public Transport

A.27 There are currently three bus stops in the vicinity of the site, providing four services. These provide links to Cardiff International Airport, Rhoose (CIA) Rail Station, Barry, Barry Rail Station, Llantwit Major, Bridgend and Cardiff.

A.28 There are six rail stations within 25 minutes cycle time of the station. The two closest, Rhoose (CIA) and Barry Rail Stations, provide services to and from Cardiff Central, Newport, Bridgend, Aberdare and Merthyr Tydfil.

### Bus

A.29 There are three bus stops in the vicinity of the site. A summary of the frequency of the pre-pandemic services is provided in Table A1. The applicant understands that the pandemic has

affected bus services, the X91 bus service no longer runs and the 303 and 304 service now splits buses Bridgend to Llantwit and Llantwit to Cardiff.

### Wellford Farm Bus Stop (North-Eastern Boundary of Site)

A.30 This stop is located on the A4226 Port Road approximately 300 metres walking distance north-east from the A4226 / Port Road roundabout. The stop provides timetable information and services the 303 and X91 bus routes. There are currently no footways or footpaths to access this stop.

### Sky Plaza Hotel Bus Stop (North of Site Boundary)

A.31 This stop is located on Port Road approximately 200 metres south-west from the A4226 / Port Road roundabout. The stop provides timetable information and services the 303, X91 and TrawsCymru T9 bus routes. There are currently no footways or footpaths to access this stop.

### Holiday Inn Express Bus Stop (South-West of the Site)

A.32 This stop is also located on Port Road, accessed approximately 150 metres south of the Holiday Inn roundabout. The stop provides shelter, seating and timetable information and services the 303, 905 and X91 bus routes.

**Table A1: Frequency of Pre-Pandemic Services Available from Nearby Bus Stops ***

| Service | Stop | Route | Weekday Frequency (per hour) | | | Time | |
|---|---|---|---|---|---|---|---|
| | | | AM Peak (0700-0900) | Inter-Peak | PM Peak (1630-1830) | First Arrival | Last Departure |
| 303 | Wellford Farm, Sky Plaza Hotel, Holiday Inn Express. | Bridgend - Barry | Two per hour | One per hour | Two per hour | 07:25 | 00:55 |
| 905 | Holiday Inn Express. | Cardiff Airport – Rhoose Railway Station | One per hour | One per hour | One per hour | 06:20 | 17:20 |
| X91 | Wellford Farm, Sky Plaza Hotel, Holiday Inn Express. | Cardiff – Llantwit Major | One service | - | One service | 06:34 | 18:20 |
| TrawsCymru T9 | Sky Plaza Hotel. | Cardiff Airport - Cardiff | Three per hour | Three per hour | Three per hour | 04:36 | 23:04 |

* timetable before temporary covid19 alterations

## Rail

A.33 The site is located between the two rail stations of Rhoose (CIA) and Barry. Both stations offer regular arrivals and departures from Cardiff Central, Newport, Bridgend, Aberdare and Merthyr Tydfil.

### Rhoose Cardiff International Airport (CIA) Rail Station

A.34 Rhoose (CIA) Rail Station is located approximately 3.9 kilometres south-west of the centre of the site. The walking isochrone map for the western part of the site, shown in Figure 5 of the TA, shows the journey time would be 40 minutes on foot. Figure 6 of the TA, the cycle isochrone maps, shows the journey to the Rail Station would take 11-minutes.

A.35 The number 905 bus service serves the rail station bus stop, approximately 50 metres walking distance from the station.

A.36 The number 303 and X91 (pre-pandemic) bus services route to and from the Station Road bus stop in Rhoose, approximately 350 metres walking distance from the station. A zebra crossing is accessible within 40 metres west of this stop, providing safe and suitable pedestrian access between the station and bus stop.

A.37 The destinations and frequency of services provided from Rhoose (CIA) Rail Station are summarised in Table A2.

**Table A2: Arrival and Departure Frequency Rhoose (CIA) Rail Station ***

| **Rhoose (CIA) Rail Station - Arrivals** | | | |
|---|---|---|---|
| **Origin** | **Weekday Frequency** | | |
| | **AM Peak (0700-0900)** | **Inter-Peak** | **PM Peak (1630-1830)** |
| Cardiff Central | 60 mins | 60 mins | 60 mins |
| Newport | 60 mins | 30 mins | 30 mins |
| Bridgend | 60 mins | 60 mins | 60 mins |
| **Rhoose (CIA) Rail Station - Departures** | | | |
| **Destination** | **Weekday Frequency** | | |
| | **AM Peak (0700-0900)** | **Inter-Peak** | **PM Peak (1630-1830)** |
| Cardiff Central | 60 mins | 60 mins | 60 mins |
| Newport | Two per hour | Two per hour | Two per hour |
| Bridgend | 60 mins | 60 mins | 60 mins |
| Aberdare | 60 mins | 60 mins | 60 mins |

* timetable before temporary covid19 alterations

A.38 Rail services at Rhoose will increase from one train per hour to two trains per hour in 2022/23 with increased bus frequency to provide access to the site.

### Barry Rail Station

A.39 Barry Rail Station is located approximately 4.9 kilometres east of the centre of the site by road (bus and cycle). Alternatively, Barry Rail Station can be accessed using Porthkerry Country Park

and the walking and cycling routes and trails provided within it. As seen on Figure 6 of the TA, the station can be accessed in 14-minutes. NCN route 88 provides a route from the development to the rail station, providing a safe and suitable cycle route via a shared cycleway / footway.

A.40 The 303 bus services the Barry Hotel bus stop, approximately 170 metres north of Barry Rail Station. A zebra crossing is provided adjacent to the stations entrance, providing safe and suitable access to and from the bus stop.

A.41 The destinations and frequency of services provided from Barry Rail Station are summarised in Table A3.

**Table A3: Arrival and Departure Frequency Barry Rail Station ***

| **Barry Rail Stations - Arrivals** | | | |
|---|---|---|---|
| **Origin** | **Weekday Frequency** | | |
| | **AM Peak (0700-0900)** | **Inter-Peak** | **PM Peak (1630-1830)** |
| Cardiff Central | 15 – 20 mins | 15 – 20 mins | 15 – 20 mins |
| Newport | 15 – 20 mins | 15 – 20 mins | 15 – 20 mins |
| Barry Island | 15 – 30 mins | 15 – 30 mins | 15 – 30 mins |
| Bridgend | 20 – 40 mins | 20 – 40 mins | 20 – 40 mins |
| Aberdare | 30 mins | 30 mins | 30 mins |
| Merthyr Tydfil | 30 mins | 30 mins | 30 mins |
| **Barry Rail Stations – Departures** | | | |
| **Destination** | **Weekday Frequency** | | |
| | **AM Peak (0700-0900)** | **Inter-Peak** | **PM Peak (1630-1830)** |
| Cardiff Central | 15 mins | 15 mins | 15 mins |
| Newport | 15 mins | 15 mins | 15 mins |
| Barry Island | 15 mins | 15 mins | 15 mins |
| Bridgend | 15 – 30 mins | 15 – 45 mins | 15 – 30 mins |
| Aberdare | 30 mins | 15 – 45 mins | 30 – 60 mins |
| Merthyr Tydfil | 30 mins | 30 mins | 30 mins |

* timetable before temporary covid19 alterations

## Key Origin Locations

A.42 The key origin destinations of the site are Rhoose, Barry, Llantwit Major, Bridgend and Cardiff. It is assumed that the majority of employees will travel to and from these destinations. Existing bus and train services provide the opportunity to travel to the development from these origin locations, along with walking and cycling for residents of Rhoose and Barry. A key element will be to ensure suitable bus service is provided to link the site with the Railway Stations.

# APPENDIX B: FUTURE YEAR TRANSPORT SITUATION

## Highway Schemes

### The 'Pendoylan Link Road'

B.1 The Sycamore Cross to M4 link is also known as the Pendoylan Link Road and is under consideration to improve the strategic transport network between the M4 Junction 34 and the A48 at Sycamore Cross / Five Mile Lane along the Pendoylan Corridor.

B.2 This would provide an alternative route to the M4 from PBPC thus providing additional highway capacity.

B.3 The scheme is currently at WelTAG stage two (Outline Business Case) and there are currently no timings associated with the delivery of such a scheme.

B.4 As such, it is not committed and has not been considered within the future year baseline position.

### Weycock Cross spur to avoid the roundabout with Port Road

B.5 The Five Mile Lane improvement works to the A4226 provided improved highway capacity along its route between Weycock Cross and the A48 Sycamore Cross.

B.6 Although associated improvements were made to the Weycock Cross roundabout as part of the Five Mile Lane works, the roundabout requires vehicles to give way to one-another and thus interrupts the free-flow of traffic between the EZ and the A48 / strategic highway network.

B.7 To overcome this and to provide additional highway capacity, VoGC have considered the provision of a spur road between Port Road and the A4226 that would bypass the Weycock Cross roundabout.

B.8 There are currently no timings associated with the delivery of such a scheme. As such, it is not committed and has not been considered within the future year baseline position.

## Active Travel Modes

B.9 VoGC has a long standing proposal to further develop the NCN Route 88, which links NCN Route 4 at Margam Park in Bridgend to NCN Route 8 in Cardiff Bay. A feasibility study that identified an indicative but preferred route for NCN 88 was prepared for VoGC by Sustrans in 2008. Some sections of the route have been confirmed and constructed, however, the remainder of the route remains indicative.

B.10 Given that such improvements would not meet Active Travel standards, it has been assumed that these remaining sections will not form part of the future transport scenario, albeit they may be available for use.

B.11 VoGC also have an aspiration to provide an active travel route along Port Road West and this forms part of Policy MG16 of the Vale of Glamorgan Local Development Plan2011 to 2026.

# Public Transport

## Rail

### Rhoose (CIA) Railway Station

B.12 There is currently one rail service per direction at Rhoose (CIA) Railway Station. As part of Phase 2 of the Cardiff Capital Region Metro, rail services will double to provide an improved frequency of service every 30 minutes per direction. It is understood that this improved frequency of service will commence in 2023.

B.13 Linked to the improved frequency of rail service, will be a commensurate increased frequency of service to the number 905 bus service.

B.14 This bus service currently provides a bus link between Rhoose (CIA) Railway Station, Cardiff Airport, PBPC and the wider EZ on an hourly basis and is timed to meet every train to / from the station. This bus service would also be increased to a service every 30 minutes timed to meet every train to / from the station.

B.15 The improved rail frequencies and bus service number 905 frequencies form part of the future transport baseline.

### Cardiff International Airport – Sustainable Transport Link

B.16 The Local Development Plan 2011 – 2026 (2017) includes Policy MG10 – St Athan – Cardiff Airport Enterprise Zone. This policy states that new aerospace, education, research and development, manufacturing, office and other ancillary development at the Cardiff Airport and gateway development zone is proposed together with sustainable transport.

B.17 Through this policy it states that the Cardiff Airport Gateway Development Zone will include 'sustainable transport infrastructure including consideration of a route for a potential rail link to Cardiff Airport across the site to ensure the development does not compromise future proposals to enhance sustainable access to the airport'.

B.18 The proposals form part of the Local Plan and are included in the Cardiff Airport 2040 Masterplan (2019). As such it was considered as part of the future baseline position and as set out in the Scoping Note and agreed with VoGC, a rail mode share of 15.8% would be assumed for airport passenger travel.

B.19 Subsequent estimations were undertaken to calculate the movement of airport passengers during the peak hour based upon airport flight data (pre-pandemic). These calculations showed that passenger movements were not focussed into the peak hours and there was a general spread of passenger movement throughout the day.

B.20 As a result, the calculations predicted that a rail mode share for passengers of 15.8% would result in negligible changes to peak hour passenger movements by car. Consequently, no adjustments have been made to background traffic flows to account for the sustainable transport link to Cardiff Airport.

### Parkway Station at M4 Junction 34

B.21 The provision of a parkway railway station with park and ride with bus integration at Junction 34 of the M4 was identified as part of the initial study work undertaken for the Sycamore Cross to M4 Link (Pendoylan Link Road). It would only be a viable option if there are highway improvements between M4 Junction 34 and the A48.

B.22 A new railway station at this location would provide frequent rail service east towards Cardiff and west towards Bridgend and Swansea, with a park and ride facility allowing for integration for passengers. It is anticipated that any such facility would provide an integrated bus service between the new railway station and Cardiff Airport, as well as PBPC, the wider EZ and other regional employment centres.

B.23 The Sycamore Cross to M4 Link WelTAG stage two report recommended that the provision of a new parkway railway station should be progressed to a GRIP2 Feasibility Study process (i.e. Governance for Railway Investment Projects).

B.24 There are currently no timings associated with the delivery of such a scheme. As such, it is not committed and has not been considered within the future year baseline position.

## Bus

B.25 A meeting held with VoGC Group Manager Transport Services (pre-pandemic) explored public transport provision and advised that VoGC have been receiving developer contributions from developers for the improvement of sustainable transport services.

B.26 The Group Manager Transport Services advised pre-pandemic that, irrespective of PBPC, the number 905 bus service may be retired and incorporated into the 303 route with its proposed increased frequency of two per hour to meet the improved train frequency service.

B.27 The Group Manager Transport Services advised that pre-pandemic the 303 could in turn penetrate the development and connect PBPC with Cardiff International Airport, Barry and Rhoose (CIA) Rail Station (with an improved 30-minute frequency to match the 2022/2023 improved rail service). He also stated that pre-pandemic the T9 bus service could form the basis of a good bus connection with Cardiff.

B.28 The Strategic Development Framework for the EZ considers an opportunity for an improved transport interchange at Cardiff Airport. A transport interchange at Cardiff Airport is also considered as a possible future phase of the Cardiff Capital Region Metro, which considers this as a bus rapid transit scheme between Cardiff city centre and Cardiff Airport, passing PBPC.

B.29 There are currently no timings associated with the delivery of an interchange at Cardiff Airport. As such, it is not committed and has not been considered within the future year baseline position.

B.30 As set out above, the improved rail frequencies at Rhoose (CIA) Railway Station and associated commensurate increased frequencies to the number 905 bus service form part of the future transport baseline.

## Summary of Committed Transport Schemes

B.31 Based upon the above, the following schemes have been considered as committed and form the future transport baseline scenario.

- Improved rail frequencies one service per direction every 30 minutes at Rhoose (CIA) Railway Station from 2023 onwards.
- Increased frequency of the number 905 bus service to one bus per direction every 30 minutes from 2023 onwards.
- Cardiff International Airport sustainable transport link.

## Background Traffic Flows

B.32 COVID-19 has led to a change in the way people live their lives, in particular travel patterns in relation to work. Although there are some theories on how this will affect traffic flows in future years (for example, more peak spreading etc), there are no commonly agreed conclusions within the transport profession.

B.33 In September 2020, Welsh Government announced their aim for 30% of the Welsh workforce to work remotely.

B.34 A high proportion of the workforce is currently working remotely as a result of the pandemic and therefore to achieve a level of 30% will not require a significant step-change.

B.35 As agreed with VoGC, background traffic flows have been adjusted to reflect this aim. As a sensitivity, background traffic flows have also been adjusted for only 20% working remotely.

B.36 Current traffic flows on the network are made up of trips associated with commuting, leisure, shopping, school escort etc. These traffic flows have been disaggregated using data from the 2019 national travel survey (pre-pandemic data) to determine the number of employment based trips within the background traffic flows.

B.37 In order to calculate the 30% reduction in commuting traffic flows during the peak hours, 2019 National Travel Survey tables have been utilised. Table NTS0409 sets out the average number of trips by trip purpose and by main mode of travel.

B.38 Table NTS0502 sets out trip start time by trip purpose (Monday to Friday only).

B.39 These two tables have then been used together to calculate the percentage of peak hour vehicle movements that are commuters. From this, a percentage reduction can be calculated to reflect 30% and 20% of the Welsh workforce working remotely. These are set out in Table B1.

**Table B1: Reduction to Peak Hour Traffic Flows to Reflect Welsh Governments Aim for Working Remotely**

| | AM Peak Hour | PM Peak Hour |
|---|---|---|
| 30% of the Welsh workforce working remotely | 9.3% | 11.7% |
| 20% of the Welsh workforce working remotely | 6.2% | 7.8% |

B.40 The future year baseline traffic flows set out in the TA have been reduced in accordance with the above.

### Cardiff International Airport

B.41 It is understood that passenger growth at the airport has been put back at least five years as a result of COVID-19. It was initially agreed with VoGC that this would be accounted for within the baseline traffic flows.

B.42 Calculations have been undertaken to determine the effect of this upon peak hour vehicle movements using the same methodology above relating to the sustainable transport link using flight data (pre-pandemic). This resulted in a similar conclusion whereby passenger growth being five years behind current levels and predictions would result in negligible changes to peak hour passenger movements by car. Consequently, no adjustments have been made to background traffic flows to account for this.

## Operation of the Highway Network

B.43 Details on the operation of the highway network, the performance of junctions and the impact by PBPC is set out in the TA and the subsequent Technical Note. In summary, only the Waycock Cross roundabout was noted as a junction impacted upon by PBPC.

B.44 The performance of the Waycock Cross roundabout has been examined in more detail. Table 9.9 of the TA sets out its performance in 2017 with and without the, then, proposed Five Mile Lane improvements. As stated in paragraph 9.26 of the TA, the results of the assessments were taken from the Transport Assessment that supported the planning application for the Five Mile Lane improvements.

B.45 Paragraph 9.27 of the TA then sets out that the geometries of the improved Waycock Cross roundabout (with the Five Mile Lane improvements) were re-measured and noted some differences, which affected its predicted operation.

B.46 Paragraph 9.28 of the TA then sets out that the geometry measurements that were used to assess its performance in the TA (with and without PBPC) were the re-measured versions.

B.47 There appears to be some inconsistencies with the geometry measurements of the Waycock Cross roundabout with one set of measurements used as part of the planning application for the Five Mile Lane improvements (which created the existing layout of the roundabout) and one set of measurements used for the PBPC TA.

B.48 Upon examining the measurements in detail there appears to be some anomalies in those within the TA whilst those that were used as part of the planning application for the Five Mile Lane improvements are agreeable.

B.49 ARCADY assessments have therefore been undertaken for the weekday AM and PM peak hours using the 2026 base traffic flow scenarios set out in the TA with a 30% reduction applied to the commuting traffic flows as detailed above. The 2026 baseline traffic flows were initially derived from the South East Wales Transport Model) and the ARCADY assessment uses the agreeable

geometries from the Five Mile Lane improvement. A summary of the results is set out in Table B2 and full print outs are attached at Appendix E.

**Table B2: Summary of ARCADY Operational Assessments at the Waycock Cross Roundabout**

| 2026 Base | | | | | | |
|---|---|---|---|---|---|---|
| Arm | AM Peak Hour 07:45 – 08:45 | | | PM Peak Hour 16:30 – 17:30 | | |
| | Max Queue (Vehicles) | Max Delay (Seconds) | Max RFC | Max Queue (Vehicles) | Max Delay (Seconds) | Max RFC |
| Port Road West | 3.5 | 13.93 | 0.78 | 2.1 | 8.99 | 0.68 |
| Waycock Road (Five Mile Lane) | 0.8 | 3.92 | 0.45 | 1.1 | 4.37 | 0.54 |
| Port Road West (e) | 0.6 | 5.41 | 0.37 | 0.6 | 5.33 | 0.36 |
| Pontypridd Road | 1.2 | 5.45 | 0.55 | 1.1 | 5.28 | 0.52 |

B.50 As can be seen, Waycock Cross is predicted to operate within capacity under 2026 baseline conditions. A maximum RFC of 0.78 is predicted on Port Road West during the AM peak hour with an associated queue length of 4 vehicles. During the PM peak hour, a maximum RFC of 0.68 is predicted on Port Road West with an associated queue length of 3 vehicles.

B.51 As a sensitivity, ARCADY assessments have also been undertaken for the weekday AM and PM peak hours using the 2026 baseline traffic flow scenarios set out in the TA with a 20% reduction applied to the commuting traffic flows as detailed above. A summary of the results is set out in Table B3 and full print outs are attached at Appendix E.

**Table B3: Summary of ARCADY Operational Assessments at the Waycock Cross Roundabout – Sensitivity**

| 2026 Base | | | | | | |
|---|---|---|---|---|---|---|
| Arm | AM Peak Hour 07:45 – 08:45 | | | PM Peak Hour 16:30 – 17:30 | | |
| | Max Queue (Vehicles) | Max Delay (Seconds) | Max RFC | Max Queue (Vehicles) | Max Delay (Seconds) | Max RFC |
| Port Road West | 4.2 | 16.24 | 0.81 | 2.5 | 10.22 | 0.72 |
| Waycock Road (Five Mile Lane) | 0.9 | 4.09 | 0.47 | 1.3 | 4.7 | 0.56 |
| Port Road West (e) | 0.6 | 5.67 | 0.39 | 0.6 | 5.64 | 0.38 |
| Pontypridd Road | 1.3 | 5.74 | 0.57 | 1.2 | 5.72 | 0.55 |

B.52 As can be seen, Waycock Cross is predicted to operate within capacity under 2026 baseline conditions. A maximum RFC of 0.81 is predicted on Port Road West during the AM peak hour with an associated queue length of 5 vehicles. During the PM peak hour, a maximum RFC of 0.72 is predicted on Port Road West with an associated queue length of 3 vehicles.

# APPENDIX C: PBPC TRANSPORT DEMAND

C.1 All estimated trip data and mode shares for PBPC is set out in the TA. Following this, to inform a Technical Note submitted during post submission discussions, Legal & General (Strategic Land) Ltd developed a hypothetical build out programme.

C.2 This was only hypothetical and only to inform the Technical Note, however, it provides a reasonable estimation on which to consider the build out of PBPC and its subsequent transport demand. Full details of the assumptions and comparisons to the TA are set out in the Technical Note.

C.3 The Technical Note estimated that the build out of PBPC could be over a 15 year period, as replicated in Table C1. This has been expanded upon to reflect the 189,725 $m^2$ GFA that is applied for within the planning application.

**Table C1: Estimated Annual Build-Out**

| Year | B1 – Office GFA | B1c/B2/B8 GFA | Industrial Land Sale GFA | Front Land Sale GFA | Total (likely) GFA | Total (Factored to application) GFA | Cumulative Total GFA |
|---|---|---|---|---|---|---|---|
| 1 | 929 m² | 4,625 m² | 8,361 m² | 2,323 m² | 16,258 m² | 19,508 $m^2$ | 19,508 $m^2$ |
| 2 | 929 m² | 4,625 m² | 8,361 m² | 465 m² | 14,400 m² | 17,278 $m^2$ | 36,786 $m^2$ |
| 3 | 929 m² | 4,625 m² | 5,574 m² | 465 m² | 11,613 m² | 13,934 $m^2$ | 50,720 $m^2$ |
| 4 | 929 m² | 4,625 m² | 5,574 m² | 1,858 m² | 13,006 m² | 15,606 $m^2$ | 66,326 $m^2$ |
| 5 | 929 m² | 4,625 m² | 4,831 m² | 2,323 m² | 13,471 m² | 16,163 $m^2$ | 82,489 $m^2$ |
| 6 | 929 m² | 4,625 m² | 4,831 m² | 1,858 m² | 12,263 m² | 14,714 $m^2$ | 97,203 $m^2$ |
| 7 | 929 m² | 4,625 m² | 4,831 m² | 2,323 m² | 12,728 m² | 15,272 $m^2$ | 112,475 $m^2$ |
| 8 | 929 m² | 4,625 m² | 4,831 m² | 2,323 m² | 12,728 m² | 15,272 $m^2$ | 127,747 $m^2$ |
| 9 | 929 m² | 4,625 m² | 4,831 m² | - | 10,405 m² | 12,485 $m^2$ | 140,232 $m^2$ |
| 10 | 929 m² | 4,625 m² | 4,831 m² | - | 10,405 m² | 12,485 $m^2$ | 152,716 $m^2$ |
| 11 | 929 m² | 4,625 m² | 4,831 m² | - | 10,405 m² | 12,485 $m^2$ | 165,201 $m^2$ |
| 12 | 929 m² | 4,625 m² | - | - | 5,574 m² | 6,688 $m^2$ | 171,890 $m^2$ |
| 13 | 929 m² | 4,625 m² | - | - | 5,574 m² | 6,688 $m^2$ | 178,578 $m^2$ |
| 14 | - | 4,625 m² | - | - | 4,645 m² | 5,574 $m^2$ | 184,151 $m^2$ |
| 15 | - | 4,625 m² | - | - | 4,645 m² | 5,574 $m^2$ | 189,725 $m^2$ |
| **Total** | **12,077 m²** | **69,677 m²** | **62,430 m²** | **13,935 m²** | **158,120 m²** | **189,725 m²** | **189,725 m²** |

C.4 In summary, estimated Gross Floor Area (GFA) per land use is broken down into the following mix:

- B1 Office: approx. 12,000m² GFA;
- B1c / B2 / B8: approx. 70,000m² GFA;
- Industrial Land Sale: approx. 62,000m² GFA; and
- Front Land Sale: approx. 14,000m² GFA.

C.5 For assessment purposes only, to enable a direct comparison to the TA, the following assumptions have been made:

- The above B1 build out is representative of the B1 assumptions (including trip rate) in the TA;
- The above B1(C)/B2/B8 build out is one-third B1, one-third B2 and one-third B8 and representative of each of these assumptions (including trip rate) in the TA;
- The above front land sale build out is one-third B1, one-third B2 and one-third B8 and representative of each of these assumptions (including trip rate) in the TA; and
- The above industrial land sale build out is representative of the B2 assumptions (including trip rate) in the TA.

C.6 Appendix B set out the sustainable transport link to Cardiff Airport as a scheme for the future year transport situation.

C.7 As agreed with VoGC via the Scoping Note, it is estimated that the provision of the sustainable transport link to the airport would lead to a mode shift of 5% (5 percentage points) from baseline estimations within the TA, Access Strategy and Updated TIS in relation to PBPC trips.

C.8 Therefore a 5% mode shift to rail has been applied to PBPC trips over and above those set out in the TA. The resultant PBPC mode shares are set out in Table C2 along with the base mode shares to set out the mode shift achieved by PBPC.

**Table C2: PBPC Mode Shares and Mode Shift**

| Mode | Base Mode Share | Travel Plan Adjusted Mode Share | Mode Shift |
|---|---|---|---|
| On foot | 5.0% | 5.0% | 0.0% |
| Bicycle | 4.4% | 10.0% | +5.6% |
| Rail | 6.6% | 7.5% | +0.9% |
| Bus | 2.1% | 12.5% | +10.4% |
| Motorcycle | 1.4% | 2.5% | +1.1% |
| Passenger in a car or van | 5.6% | 10.0% | +4.4% |
| Driving a car or van | 75.0% | 52.5% | -22.5% |
| Total | 100% | 100% | - |

C.9 Using this estimated phasing (likely) and taking into account the 5% modal shift to rail as a result of the potential rail link at Cardiff Airport, the multi modal trip generating capabilities for each year of the build out has been calculated for the AM (07:45 to 08:45) and PM (16:30 to 17:30) peak hours as well as a 12 hour (07:00 to 19:00) daily period. The results are summarised in Table C3.

**Table C3: Estimated Trip Generation Capability per Year**

| Period | Car Driver | Rail | Bus | M/C | Car Passenger | Bicycle | On Foot | Total |
|---|---|---|---|---|---|---|---|---|
| **Year 1** | | | | | | | | |
| AM Peak (0745-0845) | 65 | 9 | 15 | 3 | 12 | 12 | 6 | 123 |
| PM Peak (1630-1730) | 61 | 9 | 15 | 3 | 12 | 12 | 6 | 116 |
| 12 Hour (0700-1900) | 536 | 77 | 128 | 26 | 102 | 102 | 51 | 1020 |
| **Year 2** | | | | | | | | |
| AM Peak (0745-0845) | 56 | 8 | 13 | 3 | 11 | 11 | 5 | 107 |

| Period | Car Driver | Rail | Bus | M/C | Car Passenger | Bicycle | On Foot | Total |
|---|---|---|---|---|---|---|---|---|
| PM Peak (1630-1730) | 54 | 8 | 13 | 2 | 10 | 10 | 5 | 102 |
| 12 Hour (0700-1900) | 468 | 67 | 111 | 22 | 89 | 89 | 45 | 891 |
| **Year 3** | | | | | | | | |
| AM Peak (0745-0845) | 48 | 7 | 12 | 2 | 9 | 9 | 5 | 92 |
| PM Peak (1630-1730) | 45 | 6 | 11 | 2 | 9 | 9 | 4 | 86 |
| 12 Hour (0700-1900) | 396 | 57 | 94 | 19 | 75 | 75 | 38 | 754 |
| **Year 4** | | | | | | | | |
| AM Peak (0745-0845) | 55 | 8 | 13 | 3 | 10 | 10 | 5 | 104 |
| PM Peak (1630-1730) | 51 | 7 | 12 | 2 | 10 | 10 | 5 | 97 |
| 12 Hour (0700-1900) | 446 | 64 | 106 | 21 | 85 | 85 | 42 | 850 |
| **Year 5** | | | | | | | | |
| AM Peak (0745-0845) | 57 | 8 | 14 | 3 | 11 | 11 | 5 | 108 |
| PM Peak (1630-1730) | 53 | 7 | 13 | 2 | 10 | 10 | 5 | 100 |
| 12 Hour (0700-1900) | 463 | 66 | 110 | 22 | 88 | 88 | 44 | 883 |
| **Year 6** | | | | | | | | |
| AM Peak (0745-0845) | 53 | 8 | 13 | 3 | 10 | 10 | 5 | 100 |
| PM Peak (1630-1730) | 49 | 7 | 12 | 2 | 9 | 9 | 5 | 93 |
| 12 Hour (0700-1900) | 427 | 61 | 102 | 20 | 81 | 81 | 41 | 814 |
| **Year 7** | | | | | | | | |
| AM Peak (0745-0845) | 55 | 8 | 13 | 3 | 10 | 10 | 5 | 104 |
| PM Peak (1630-1730) | 51 | 7 | 12 | 2 | 10 | 10 | 5 | 96 |
| 12 Hour (0700-1900) | 444 | 64 | 106 | 21 | 85 | 85 | 42 | 846 |
| **Year 8** | | | | | | | | |
| AM Peak (0745-0845) | 55 | 8 | 13 | 3 | 10 | 10 | 5 | 104 |
| PM Peak (1630-1730) | 51 | 7 | 12 | 2 | 10 | 10 | 5 | 96 |
| 12 Hour (0700-1900) | 444 | 64 | 106 | 21 | 85 | 85 | 42 | 846 |
| **Year 9** | | | | | | | | |
| AM Peak (0745-0845) | 44 | 6 | 11 | 2 | 8 | 8 | 4 | 84 |
| PM Peak (1630-1730) | 41 | 6 | 10 | 2 | 8 | 8 | 4 | 78 |
| 12 Hour (0700-1900) | 359 | 51 | 86 | 17 | 68 | 68 | 34 | 685 |
| **Year 10** | | | | | | | | |
| AM Peak (0745-0845) | 44 | 6 | 11 | 2 | 8 | 8 | 4 | 84 |
| PM Peak (1630-1730) | 41 | 6 | 10 | 2 | 8 | 8 | 4 | 78 |
| 12 Hour (0700-1900) | 359 | 51 | 86 | 17 | 68 | 68 | 34 | 685 |
| **Year 11** | | | | | | | | |
| AM Peak (0745-0845) | 44 | 6 | 11 | 2 | 8 | 8 | 4 | 84 |
| PM Peak (1630-1730) | 41 | 6 | 10 | 2 | 8 | 8 | 4 | 78 |
| 12 Hour (0700-1900) | 359 | 51 | 86 | 17 | 68 | 68 | 34 | 685 |
| **Year 12** | | | | | | | | |
| AM Peak (0745-0845) | 30 | 4 | 7 | 1 | 6 | 6 | 3 | 58 |
| PM Peak (1630-1730) | 27 | 4 | 6 | 1 | 5 | 5 | 3 | 50 |
| 12 Hour (0700-1900) | 234 | 33 | 56 | 11 | 45 | 45 | 22 | 446 |
| **Year 13** | | | | | | | | |
| AM Peak (0745-0845) | 30 | 4 | 7 | 1 | 6 | 6 | 3 | 58 |
| PM Peak (1630-1730) | 27 | 4 | 6 | 1 | 5 | 5 | 3 | 50 |
| 12 Hour (0700-1900) | 234 | 33 | 56 | 11 | 45 | 45 | 22 | 446 |
| **Year 14** | | | | | | | | |

| Period | Car Driver | Rail | Bus | M/C | Car Passenger | Bicycle | On Foot | Total |
|---|---|---|---|---|---|---|---|---|
| AM Peak (0745-0845) | 21 | 3 | 5 | 1 | 4 | 4 | 2 | 41 |
| PM Peak (1630-1730) | 19 | 3 | 5 | 1 | 4 | 4 | 2 | 36 |
| 12 Hour (0700-1900) | 170 | 24 | 40 | 8 | 32 | 32 | 16 | 323 |
| **Year 15** | | | | | | | | |
| AM Peak (0745-0845) | 21 | 3 | 5 | 1 | 4 | 4 | 2 | 41 |
| PM Peak (1630-1730) | 19 | 3 | 5 | 1 | 4 | 4 | 2 | 36 |
| 12 Hour (0700-1900) | 170 | 24 | 40 | 8 | 32 | 32 | 16 | 323 |

C.10 It should be noted that the above estimates are based upon the predicted build out of the development, whereas the application seeks up to 189,725m$^2$ GFA. Table C4 has therefore been created to show the annual trip generation of the proposals based upon the maximum GFA sought as part of the planning application.

**Table C4: Estimated Trip Generation Capability per Year (189,725m$^2$ GFA)**

| Period | Car Driver | Rail | Bus | M/C | Car Passenger | Bicycle | On Foot | Total |
|---|---|---|---|---|---|---|---|---|
| **Year 1** | | | | | | | | |
| AM Peak (0745-0845) | 78 | 11 | 19 | 4 | 15 | 15 | 7 | 148 |
| PM Peak (1630-1730) | 73 | 10 | 17 | 3 | 14 | 14 | 7 | 140 |
| 12 Hour (0700-1900) | 643 | 92 | 153 | 31 | 122 | 122 | 61 | 1224 |
| **Year 2** | | | | | | | | |
| AM Peak (0745-0845) | 67 | 10 | 16 | 3 | 13 | 13 | 6 | 129 |
| PM Peak (1630-1730) | 64 | 9 | 15 | 3 | 12 | 12 | 6 | 122 |
| 12 Hour (0700-1900) | 561 | 80 | 134 | 27 | 107 | 107 | 53 | 1069 |
| **Year 3** | | | | | | | | |
| AM Peak (0745-0845) | 58 | 8 | 14 | 3 | 11 | 11 | 6 | 110 |
| PM Peak (1630-1730) | 54 | 8 | 13 | 3 | 10 | 10 | 5 | 103 |
| 12 Hour (0700-1900) | 475 | 68 | 113 | 23 | 90 | 90 | 45 | 904 |
| **Year 4** | | | | | | | | |
| AM Peak (0745-0845) | 66 | 9 | 16 | 3 | 12 | 12 | 6 | 125 |
| PM Peak (1630-1730) | 61 | 9 | 14 | 3 | 12 | 12 | 6 | 116 |
| 12 Hour (0700-1900) | 536 | 77 | 128 | 26 | 102 | 102 | 51 | 1020 |
| **Year 5** | | | | | | | | |
| AM Peak (0745-0845) | 68 | 10 | 16 | 3 | 13 | 13 | 6 | 130 |
| PM Peak (1630-1730) | 63 | 9 | 15 | 3 | 12 | 12 | 6 | 120 |
| 12 Hour (0700-1900) | 556 | 79 | 132 | 27 | 106 | 106 | 53 | 1059 |
| **Year 6** | | | | | | | | |
| AM Peak (0745-0845) | 63 | 9 | 15 | 3 | 12 | 12 | 6 | 120 |
| PM Peak (1630-1730) | 58 | 8 | 14 | 3 | 11 | 11 | 6 | 111 |
| 12 Hour (0700-1900) | 513 | 73 | 122 | 24 | 98 | 98 | 49 | 977 |
| **Year 7** | | | | | | | | |
| AM Peak (0745-0845) | 66 | 9 | 16 | 3 | 12 | 12 | 6 | 125 |
| PM Peak (1630-1730) | 61 | 9 | 14 | 3 | 12 | 12 | 6 | 115 |
| 12 Hour (0700-1900) | 533 | 76 | 127 | 25 | 102 | 102 | 51 | 1015 |
| **Year 8** | | | | | | | | |
| AM Peak (0745-0845) | 66 | 9 | 16 | 3 | 12 | 12 | 6 | 125 |
| PM Peak (1630-1730) | 61 | 9 | 14 | 3 | 12 | 12 | 6 | 115 |
| 12 Hour (0700-1900) | 533 | 76 | 127 | 25 | 102 | 102 | 51 | 1015 |

| Period | Car Driver | Rail | Bus | M/C | Car Passenger | Bicycle | On Foot | Total |
|---|---|---|---|---|---|---|---|---|
| **Year 9** | | | | | | | | |
| AM Peak (0745-0845) | 53 | 8 | 13 | 3 | 10 | 10 | 5 | 101 |
| PM Peak (1630-1730) | 49 | 7 | 12 | 2 | 9 | 9 | 5 | 94 |
| 12 Hour (0700-1900) | 431 | 62 | 103 | 21 | 82 | 82 | 41 | 821 |
| **Year 10** | | | | | | | | |
| AM Peak (0745-0845) | 53 | 8 | 13 | 3 | 10 | 10 | 5 | 101 |
| PM Peak (1630-1730) | 49 | 7 | 12 | 2 | 9 | 9 | 5 | 94 |
| 12 Hour (0700-1900) | 431 | 62 | 103 | 21 | 82 | 82 | 41 | 821 |
| **Year 11** | | | | | | | | |
| AM Peak (0745-0845) | 53 | 8 | 13 | 3 | 10 | 10 | 5 | 101 |
| PM Peak (1630-1730) | 49 | 7 | 12 | 2 | 9 | 9 | 5 | 94 |
| 12 Hour (0700-1900) | 431 | 62 | 103 | 21 | 82 | 82 | 41 | 821 |
| **Year 12** | | | | | | | | |
| AM Peak (0745-0845) | 36 | 5 | 9 | 2 | 7 | 7 | 3 | 69 |
| PM Peak (1630-1730) | 32 | 5 | 8 | 1 | 6 | 6 | 3 | 61 |
| 12 Hour (0700-1900) | 281 | 40 | 67 | 13 | 54 | 54 | 27 | 536 |
| **Year 13** | | | | | | | | |
| AM Peak (0745-0845) | 36 | 5 | 9 | 2 | 7 | 7 | 3 | 69 |
| PM Peak (1630-1730) | 32 | 5 | 8 | 1 | 6 | 6 | 3 | 61 |
| 12 Hour (0700-1900) | 281 | 40 | 67 | 13 | 54 | 54 | 27 | 536 |
| **Year 14** | | | | | | | | |
| AM Peak (0745-0845) | 25 | 4 | 6 | 1 | 5 | 5 | 2 | 49 |
| PM Peak (1630-1730) | 23 | 3 | 5 | 1 | 4 | 4 | 2 | 43 |
| 12 Hour (0700-1900) | 204 | 29 | 48 | 10 | 39 | 39 | 19 | 388 |
| **Year 15** | | | | | | | | |
| AM Peak (0745-0845) | 25 | 4 | 6 | 1 | 5 | 5 | 2 | 49 |
| PM Peak (1630-1730) | 23 | 3 | 5 | 1 | 4 | 4 | 2 | 43 |
| 12 Hour (0700-1900) | 204 | 29 | 48 | 10 | 39 | 39 | 19 | 388 |

C.11 The multi modal trip generation shown in Table C4 (189,725m$^2$ GFA) has been aggregated to determine the cumulative trips per annum generated by the build out of the proposals, as shown in Table C5.

**Table C5: Estimated Cumulative Trip Generation Capability (189,725m$^2$ GFA)**

| Period | Car Driver | Rail | Bus | M/C | Car Passenger | Bicycle | On Foot | Total |
|---|---|---|---|---|---|---|---|---|
| **Year 1** | | | | | | | | |
| AM Peak (0745-0845) | 78 | 11 | 19 | 4 | 15 | 15 | 7 | 148 |
| PM Peak (1630-1730) | 73 | 10 | 17 | 3 | 14 | 14 | 7 | 140 |
| 12 Hour (0700-1900) | 643 | 92 | 153 | 31 | 122 | 122 | 61 | 1,224 |
| **Year 2** | | | | | | | | |
| AM Peak (0745-0845) | 145 | 21 | 35 | 7 | 28 | 28 | 14 | 277 |
| PM Peak (1630-1730) | 138 | 19 | 33 | 6 | 26 | 26 | 13 | 262 |
| 12 Hour (0700-1900) | 1,204 | 172 | 287 | 57 | 229 | 229 | 115 | 2,293 |
| **Year 3** | | | | | | | | |
| AM Peak (0745-0845) | 203 | 29 | 48 | 10 | 39 | 39 | 19 | 387 |
| PM Peak (1630-1730) | 192 | 27 | 46 | 9 | 37 | 37 | 18 | 365 |
| 12 Hour (0700-1900) | 1,679 | 240 | 400 | 80 | 320 | 320 | 160 | 3,197 |

| Period | Car Driver | Rail | Bus | M/C | Car Passenger | Bicycle | On Foot | Total |
|---|---|---|---|---|---|---|---|---|
| **Year 4** | | | | | | | | |
| AM Peak (0745-0845) | 268 | 39 | 64 | 13 | 51 | 51 | 26 | 512 |
| PM Peak (1630-1730) | 253 | 36 | 60 | 12 | 48 | 48 | 24 | 481 |
| 12 Hour (0700-1900) | 2,214 | 317 | 527 | 106 | 422 | 422 | 211 | 4,218 |
| **Year 5** | | | | | | | | |
| AM Peak (0745-0845) | 337 | 48 | 80 | 16 | 64 | 64 | 32 | 642 |
| PM Peak (1630-1730) | 316 | 45 | 75 | 15 | 60 | 60 | 30 | 602 |
| 12 Hour (0700-1900) | 2,770 | 396 | 660 | 132 | 528 | 528 | 264 | 5,277 |
| **Year 6** | | | | | | | | |
| AM Peak (0745-0845) | 400 | 57 | 95 | 19 | 76 | 76 | 38 | 762 |
| PM Peak (1630-1730) | 375 | 53 | 89 | 17 | 71 | 71 | 36 | 713 |
| 12 Hour (0700-1900) | 3,283 | 469 | 782 | 157 | 625 | 625 | 312 | 6,253 |
| **Year 7** | | | | | | | | |
| AM Peak (0745-0845) | 465 | 67 | 111 | 22 | 89 | 89 | 44 | 887 |
| PM Peak (1630-1730) | 435 | 62 | 103 | 20 | 83 | 83 | 42 | 828 |
| 12 Hour (0700-1900) | 3,816 | 545 | 909 | 182 | 727 | 727 | 363 | 7,269 |
| **Year 8** | | | | | | | | |
| AM Peak (0745-0845) | 531 | 76 | 127 | 26 | 101 | 101 | 51 | 1,012 |
| PM Peak (1630-1730) | 496 | 70 | 118 | 23 | 95 | 95 | 47 | 943 |
| 12 Hour (0700-1900) | 4,349 | 622 | 1,036 | 207 | 828 | 828 | 414 | 8,284 |
| **Year 9** | | | | | | | | |
| AM Peak (0745-0845) | 584 | 84 | 139 | 28 | 111 | 111 | 56 | 1,113 |
| PM Peak (1630-1730) | 545 | 77 | 129 | 25 | 104 | 104 | 52 | 1,037 |
| 12 Hour (0700-1900) | 4,780 | 683 | 1,138 | 228 | 910 | 910 | 455 | 9,105 |
| **Year 10** | | | | | | | | |
| AM Peak (0745-0845) | 636 | 91 | 152 | 31 | 121 | 121 | 61 | 1,214 |
| PM Peak (1630-1730) | 594 | 84 | 141 | 28 | 113 | 113 | 57 | 1,131 |
| 12 Hour (0700-1900) | 5,212 | 745 | 1,241 | 249 | 992 | 992 | 496 | 9,927 |
| **Year 11** | | | | | | | | |
| AM Peak (0745-0845) | 689 | 99 | 165 | 33 | 131 | 131 | 66 | 1,314 |
| PM Peak (1630-1730) | 644 | 91 | 153 | 30 | 123 | 123 | 61 | 1,225 |
| 12 Hour (0700-1900) | 5,643 | 807 | 1,344 | 269 | 1,075 | 1,075 | 537 | 10,748 |
| **Year 12** | | | | | | | | |
| AM Peak (0745-0845) | 726 | 104 | 173 | 35 | 138 | 138 | 69 | 1,384 |
| PM Peak (1630-1730) | 675 | 96 | 160 | 31 | 129 | 129 | 64 | 1,285 |
| 12 Hour (0700-1900) | 5,924 | 847 | 1,411 | 283 | 1,128 | 1,128 | 564 | 11,284 |
| **Year 13** | | | | | | | | |
| AM Peak (0745-0845) | 762 | 109 | 182 | 37 | 145 | 145 | 73 | 1,453 |
| PM Peak (1630-1730) | 707 | 100 | 168 | 33 | 135 | 135 | 67 | 1,346 |
| 12 Hour (0700-1900) | 6,205 | 887 | 1,478 | 296 | 1,182 | 1,182 | 590 | 11,819 |
| **Year 14** | | | | | | | | |
| AM Peak (0745-0845) | 787 | 113 | 188 | 38 | 150 | 150 | 75 | 1,502 |
| PM Peak (1630-1730) | 730 | 103 | 173 | 34 | 139 | 139 | 70 | 1,389 |
| 12 Hour (0700-1900) | 6,409 | 916 | 1,526 | 306 | 1,220 | 1,220 | 610 | 12,207 |
| **Year 15** | | | | | | | | |
| AM Peak (0745-0845) | 813 | 117 | 194 | 39 | 155 | 155 | 77 | 1,550 |
| PM Peak (1630-1730) | 753 | 107 | 179 | 35 | 144 | 144 | 72 | 1,432 |

| Period | Car Driver | Rail | Bus | M/C | Car Passenger | Bicycle | On Foot | Total |
|---|---|---|---|---|---|---|---|---|
| 12 Hour (0700-1900) | 6,612 | 945 | 1,575 | 315 | 1,259 | 1,259 | 629 | 12,595 |

# APPENDIX D: INDICATIVE CONCEPT MASTERPLAN AND MOVEMENT AND ACCESS PARAMETER PLAN

Notes
1. This drawing has been prepared in accordance with the scope of RPS's appointment with its client and is subject to the terms and conditions of that appointment. RPS accepts no liability for any use of this document other than by its client and only for the purposes for which it was prepared and provided.
2. If received electronically it is the recipients responsibility to print to correct scale. Only written dimensions should be used.

NORTH

- Land In Ownership of L&G
- Site Boundary
- Allocated Porthkerry Park Extension Boundary
- Further Possible Extension to Porthkerry Park Boundary
- B1 (Office)
- B1/B8
- B2/B8
- B8
- Existing Road Network
- Proposed Spine Road Corridor (setting of spine road shown in a corridor to allow flexibility for final alignment)
- Access Roads
- Existing PROW
- Existing Cycle Route
- Proposed Pedestrian Link
- Proposed Native Woodland Planting
- Existing Tree Belts / Existing hedgerows
- Landscape Buffer/Open Space
- Combined Ecology and Drainage Corridors
- SUDS Attenuation Areas/Swales
- Proposed 10m Footway/Cycleway
- Indicative Safeguarded Land for Future Rapid Transit Corridor
- Potential Area for Relocated Hotel Car Parking (approx. 1,500 sqm)

| Rev | Description | Date | Initial | Checked |
|---|---|---|---|---|
| | | | | |
| | | | | |

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Project: Parc Busnes Porth Cymru

Title: Indicative Concept Masterplan

| Status | Drawn By | PM/Checked by |
|---|---|---|
| DRAFT | AW/PO | HD/DP |
| **Job Ref** | **Scale @ A2** | **Date Created** |
| JCD0064 | 1:5000 | MAY 2018 |

Drawing Number: JCD0064-003

Rev: O

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2. If received electronically it is the recipients responsibility to print to correct scale. Only written dimensions should be used.

NORTH

- Site Boundary
- Vehicle Site Access
- Existing Road Network
- Proposed Spine Road Corridor (setting of spine road shown in a corridor to allow flexibility for final alignment)
- Secondary Access Roads
- Existing PROW
- Existing Cycle Route (NCN 88)
- Proposed Cycle Route Link
- Proposed Pedestrian Link
- Proposed Pedestrian Access Points
- Proposed 10m Footway/Cycleway
- Indicative Safeguarded Land for Future Rapid Transit Corridor
- Potential Area for Relocated Hotel Car Parking (approx. 1,500 sqm)

| Rev | Description | Date | Initial | Checked |
|---|---|---|---|---|
| | | | | |
| | | | | |

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Project: Parc Busnes Porth Cymru

Title: Parameter Plan: Movement & Access

| Status | Drawn By | PM/Checked by |
|---|---|---|
| DRAFT | PO | HD/RL |
| **Job Ref** | **Scale @ A2** | **Date Created** |
| JCD0064 | 1:5000 | MAY 2019 |
| **Drawing Number** | | **Rev** |
| JCD0064-005 | | D |

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# APPENDIX E: ASSUMPTIONS FOR BUS REQUIREMENTS AT PBPC

E.1 In order to assess bus requirements at PBPC, a number of considerations and assumptions have been made based on pre-pandemic services as follows:

- Increased frequency of the number 905 bus service to one bus per direction every 30 minutes from 2023 onwards in association with the increased rail frequencies at Rhoose (CIA) Railway Station.
- The number 905 bus service is currently still operating, therefore, for the purposes of this assessment, assume the number 303 bus service retains its existing route and frequencies.
- Bus patronage relates to attractiveness and frequency in addition to available seats (and cost, routes and journey time).
- The key origin destinations are Rhoose, Barry, Llantwit Major, Bridgend and Cardiff, therefore additional patronage will be spread over different bus services and / or different sections of journey of the same service.
- As a means of identifying triggers for bus improvements:
  - Exclude the number 905 bus service as it is a bespoke service that doesn't serve all of the key origin destinations.
  - The T9 bus service already operates every 20 minutes and provides an excellent service between Cardiff and PBPC.
  - Focus on the number 303 bus service, which routes between the majority of the key origin destinations, and its available seating capacity.
  - Assume that when available seating capacity on the number 303 bus service is reached, that will represent a trigger to provide additional / improved bus services.
  - Such a trigger will not necessarily mean that there is no available seating because additional patronage will be spread over different bus services and / or different sections of journey of the same service. However, it balances seating capacity with services to all key origin destinations with the consideration of attractiveness.

# APPENDIX F: ARCADY OPERATIONAL ASSESSMENTS AT WEYCOCK CROSS ROUNDABOUT

# Junctions 9

## ARCADY 9 - Roundabout Module

Version: 9.5.1.7462


**Filename:** Waycock Cross 2026 Commute Base 30% reduction plus Dev (82,489m²).j9
**Path:** P:\JNY9624 - Model Farm, Nr Cardiff\Transport\Arcady
**Report generation date:** 10/03/2021 14:45:57

---

»2026 Base (commute trips 30% reduction), AM
»2026 Base (commute trips 30% reduction) + Dev (82,489m²), AM
»2026 Base (commute trips 30% reduction), PM
»2026 Base (commute trips 30% reduction) + Dev (82,489m²), PM

### Summary of junction performance

| | AM | | | PM | | |
|---|---|---|---|---|---|---|
| | Queue (Veh) | Delay (s) | RFC | Queue (Veh) | Delay (s) | RFC |
| | 2026 Base (commute trips 30% reduction) | | | | | |
| 1 - Port Road East | 0.6 | 5.41 | 0.37 | 0.6 | 5.33 | 0.36 |
| 2 - Pontrypridd Road | 1.2 | 5.45 | 0.55 | 1.1 | 5.28 | 0.52 |
| 3 - Port Road West | 3.5 | 13.93 | 0.78 | 2.1 | 8.99 | 0.68 |
| 4 - Waycock Road (Five Mile Lane) | 0.8 | 3.92 | 0.45 | 1.1 | 4.37 | 0.54 |
| | 2026 Base (commute trips 30% reduction) + Dev (82,489m²) | | | | | |
| 1 - Port Road East | 0.9 | 6.62 | 0.47 | 0.6 | 5.45 | 0.38 |
| 2 - Pontrypridd Road | 1.4 | 6.78 | 0.59 | 0.9 | 4.77 | 0.47 |
| 3 - Port Road West | 4.1 | 15.50 | 0.81 | 4.2 | 14.64 | 0.81 |
| 4 - Waycock Road (Five Mile Lane) | 0.9 | 4.14 | 0.48 | 1.1 | 4.59 | 0.53 |

*There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.*

*Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.*

### File summary

#### File Description

| | |
|---|---|
| Title | |
| Location | |
| Site number | |
| Date | 03/06/2019 |
| Version | |
| Status | (new file) |
| Identifier | |
| Client | |
| Jobnumber | |
| Enumerator | EUR\Alex.Snartt |
| Description | |

## Units

| Distance units | Speed units | Traffic units input | Traffic units results | Flow units | Average delay units | Total delay units | Rate of delay units |
|---|---|---|---|---|---|---|---|
| m | kph | Veh | Veh | perHour | s | -Min | perMin |

## Analysis Options

| Calculate Queue Percentiles | Calculate residual capacity | RFC Threshold | Average Delay threshold (s) | Queue threshold (PCU) |
|---|---|---|---|---|
| | | 0.85 | 36.00 | 20.00 |

## Demand Set Summary

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) |
|---|---|---|---|---|---|---|
| D1 | 2026 Base (commute trips 30% reduction) | AM | ONE HOUR | 07:45 | 09:15 | 15 |
| D2 | 2026 Base (commute trips 30% reduction) + Dev (82,489m²) | AM | ONE HOUR | 07:45 | 09:15 | 15 |
| D3 | 2026 Base (commute trips 30% reduction) | PM | ONE HOUR | 16:30 | 18:00 | 15 |
| D4 | 2026 Base (commute trips 30% reduction) + Dev (82,489m²) | PM | ONE HOUR | 16:30 | 18:00 | 15 |

## Analysis Set Details

| ID | Network flow scaling factor (%) |
|---|---|
| A1 | 100.000 |

# 2026 Base (commute trips 30% reduction), AM

### Data Errors and Warnings

| Severity | Area | Item | Description |
|---|---|---|---|
| Warning | Geometry | 1 - Port Road East - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |
| Warning | Geometry | 4 - Waycock Road (Five Mile Lane) - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |

## Junction Network

### Junctions

| Junction | Name | Junction type | Use circulating lanes | Arm order | Junction Delay (s) | Junction LOS |
|---|---|---|---|---|---|---|
| 1 | Waycock Cross Roundabout | Standard Roundabout | | 1, 2, 3, 4 | 7.75 | A |

### Junction Network Options

| Driving side | Lighting |
|---|---|
| Left | Normal/unknown |

## Arms

### Arms

| Arm | Name | Description |
|---|---|---|
| 1 | Port Road East | |
| 2 | Pontrypridd Road | |
| 3 | Port Road West | |
| 4 | Waycock Road (Five Mile Lane) | |

### Roundabout Geometry

| Arm | V - Approach road half-width (m) | E - Entry width (m) | l' - Effective flare length (m) | R - Entry radius (m) | D - Inscribed circle diameter (m) | PHI - Conflict (entry) angle (deg) | Exit only |
|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 4.50 | 6.50 | 37.5 | 15.0 | 51.0 | 45.0 | |
| 2 - Pontrypridd Road | 6.25 | 7.00 | 3.0 | 20.0 | 51.0 | 38.0 | |
| 3 - Port Road West | 3.50 | 8.50 | 14.0 | 10.0 | 51.0 | 45.0 | |
| 4 - Waycock Road (Five Mile Lane) | 4.00 | 8.00 | 53.0 | 13.0 | 50.0 | 20.0 | |

### Slope / Intercept / Capacity

#### Roundabout Slope and Intercept used in model

| Arm | Final slope | Final intercept (PCU/hr) |
|---|---|---|
| 1 - Port Road East | 0.594 | 1753 |
| 2 - Pontrypridd Road | 0.646 | 1964 |
| 3 - Port Road West | 0.554 | 1589 |
| 4 - Waycock Road (Five Mile Lane) | 0.707 | 2207 |

*The slope and intercept shown above include any corrections and adjustments.*

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) |
|---|---|---|---|---|---|---|
| D1 | 2026 Base (commute trips 30% reduction) | AM | ONE HOUR | 07:45 | 09:15 | 15 |

| Vehicle mix source | PCU Factor for a HV (PCU) |
|---|---|
| HV Percentages | 2.00 |

### Demand overview (Traffic)

| Arm | Linked arm | Use O-D data | Average Demand (Veh/hr) | Scaling Factor (%) |
|---|---|---|---|---|
| 1 - Port Road East | | ✓ | 355 | 100.000 |
| 2 - Pontrypridd Road | | ✓ | 726 | 100.000 |
| 3 - Port Road West | | ✓ | 847 | 100.000 |
| 4 - Waycock Road (Five Mile Lane) | | ✓ | 677 | 100.000 |

## Origin-Destination Data

### Demand (Veh/hr)

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 43 | 220 | 92 |
| | 2 - Pontrypridd Road | 64 | 0 | 245 | 417 |
| | 3 - Port Road West | 231 | 278 | 0 | 338 |
| | 4 - Waycock Road (Five Mile Lane) | 78 | 332 | 267 | 0 |

## Vehicle Mix

### Heavy Vehicle Percentages

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 2 | 14 | 2 |
| | 2 - Pontrypridd Road | 1 | 0 | 2 | 7 |
| | 3 - Port Road West | 7 | 2 | 0 | 0 |
| | 4 - Waycock Road (Five Mile Lane) | 3 | 9 | 0 | 0 |

## Results

### Results Summary for whole modelled period

| Arm | Max RFC | Max Delay (s) | Max Queue (Veh) | Max LOS |
|---|---|---|---|---|
| 1 - Port Road East | 0.37 | 5.41 | 0.6 | A |
| 2 - Pontrypridd Road | 0.55 | 5.45 | 1.2 | A |
| 3 - Port Road West | 0.78 | 13.93 | 3.5 | B |
| 4 - Waycock Road (Five Mile Lane) | 0.45 | 3.92 | 0.8 | A |

### Main Results for each time segment

#### 07:45 - 08:00

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 267 | 658 | 1230 | 0.217 | 266 | 0.3 | 3.733 | A |
| 2 - Pontrypridd Road | 547 | 434 | 1592 | 0.343 | 544 | 0.5 | 3.430 | A |
| 3 - Port Road West | 638 | 430 | 1304 | 0.489 | 634 | 0.9 | 5.341 | A |
| 4 - Waycock Road (Five Mile Lane) | 510 | 429 | 1806 | 0.282 | 508 | 0.4 | 2.770 | A |

### 08:00 - 08:15

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 319 | 787 | 1157 | 0.276 | 319 | 0.4 | 4.295 | A |
| 2 - Pontrypridd Road | 653 | 520 | 1536 | 0.425 | 652 | 0.7 | 4.069 | A |
| 3 - Port Road West | 761 | 514 | 1256 | 0.606 | 759 | 1.5 | 7.215 | A |
| 4 - Waycock Road (Five Mile Lane) | 609 | 514 | 1746 | 0.349 | 608 | 0.5 | 3.161 | A |

### 08:15 - 08:30

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 391 | 962 | 1058 | 0.370 | 390 | 0.6 | 5.385 | A |
| 2 - Pontrypridd Road | 799 | 636 | 1460 | 0.547 | 797 | 1.2 | 5.418 | A |
| 3 - Port Road West | 933 | 629 | 1190 | 0.784 | 925 | 3.4 | 13.209 | B |
| 4 - Waycock Road (Five Mile Lane) | 745 | 626 | 1667 | 0.447 | 744 | 0.8 | 3.894 | A |

### 08:30 - 08:45

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 391 | 965 | 1056 | 0.370 | 391 | 0.6 | 5.413 | A |
| 2 - Pontrypridd Road | 799 | 637 | 1459 | 0.548 | 799 | 1.2 | 5.454 | A |
| 3 - Port Road West | 933 | 631 | 1189 | 0.784 | 932 | 3.5 | 13.926 | B |
| 4 - Waycock Road (Five Mile Lane) | 745 | 631 | 1664 | 0.448 | 745 | 0.8 | 3.917 | A |

### 08:45 - 09:00

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 319 | 792 | 1154 | 0.277 | 320 | 0.4 | 4.320 | A |
| 2 - Pontrypridd Road | 653 | 522 | 1535 | 0.425 | 654 | 0.7 | 4.099 | A |
| 3 - Port Road West | 761 | 517 | 1255 | 0.607 | 769 | 1.6 | 7.531 | A |
| 4 - Waycock Road (Five Mile Lane) | 609 | 520 | 1742 | 0.349 | 610 | 0.5 | 3.184 | A |

### 09:00 - 09:15

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 267 | 662 | 1228 | 0.218 | 268 | 0.3 | 3.751 | A |
| 2 - Pontrypridd Road | 547 | 437 | 1590 | 0.344 | 547 | 0.5 | 3.454 | A |
| 3 - Port Road West | 638 | 432 | 1303 | 0.489 | 640 | 1.0 | 5.451 | A |
| 4 - Waycock Road (Five Mile Lane) | 510 | 433 | 1803 | 0.283 | 510 | 0.4 | 2.785 | A |

# 2026 Base (commute trips 30% reduction) + Dev (82,489m²), AM

### Data Errors and Warnings

| Severity | Area | Item | Description |
|---|---|---|---|
| Warning | Geometry | 1 - Port Road East - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |
| Warning | Geometry | 4 - Waycock Road (Five Mile Lane) - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |

## Junction Network

### Junctions

| Junction | Name | Junction type | Use circulating lanes | Arm order | Junction Delay (s) | Junction LOS |
|---|---|---|---|---|---|---|
| 1 | Waycock Cross Roundabout | Standard Roundabout | | 1, 2, 3, 4 | 8.85 | A |

### Junction Network Options

| Driving side | Lighting |
|---|---|
| Left | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) |
|---|---|---|---|---|---|---|
| D2 | 2026 Base (commute trips 30% reduction) + Dev (82,489m²) | AM | ONE HOUR | 07:45 | 09:15 | 15 |

| Vehicle mix source | PCU Factor for a HV (PCU) |
|---|---|
| HV Percentages | 2.00 |

### Demand overview (Traffic)

| Arm | Linked arm | Use O-D data | Average Demand (Veh/hr) | Scaling Factor (%) |
|---|---|---|---|---|
| 1 - Port Road East | | ✓ | 442 | 100.000 |
| 2 - Pontrypridd Road | | ✓ | 703 | 100.000 |
| 3 - Port Road West | | ✓ | 894 | 100.000 |
| 4 - Waycock Road (Five Mile Lane) | | ✓ | 733 | 100.000 |

## Origin-Destination Data

### Demand (Veh/hr)

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 42 | 317 | 83 |
| | 2 - Pontrypridd Road | 44 | 0 | 278 | 381 |
| | 3 - Port Road West | 241 | 280 | 0 | 373 |
| | 4 - Waycock Road (Five Mile Lane) | 60 | 284 | 389 | 0 |

## Vehicle Mix

### Heavy Vehicle Percentages

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 8 | 9 | 2 |
| | 2 - Pontrypridd Road | 2 | 0 | 5 | 7 |
| | 3 - Port Road West | 12 | 2 | 0 | 0 |
| | 4 - Waycock Road (Five Mile Lane) | 3 | 9 | 0 | 0 |

# Results

## Results Summary for whole modelled period

| Arm | Max RFC | Max Delay (s) | Max Queue (Veh) | Max LOS |
|---|---|---|---|---|
| 1 - Port Road East | 0.47 | 6.62 | 0.9 | A |
| 2 - Pontrypridd Road | 0.59 | 6.78 | 1.4 | A |
| 3 - Port Road West | 0.81 | 15.50 | 4.1 | C |
| 4 - Waycock Road (Five Mile Lane) | 0.48 | 4.14 | 0.9 | A |

## Main Results for each time segment

### 07:45 - 08:00

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 333 | 715 | 1221 | 0.272 | 331 | 0.4 | 4.039 | A |
| 2 - Pontrypridd Road | 529 | 592 | 1480 | 0.358 | 527 | 0.6 | 3.770 | A |
| 3 - Port Road West | 673 | 381 | 1315 | 0.512 | 669 | 1.0 | 5.537 | A |
| 4 - Waycock Road (Five Mile Lane) | 552 | 423 | 1821 | 0.303 | 550 | 0.4 | 2.829 | A |

### 08:00 - 08:15

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 397 | 855 | 1141 | 0.348 | 397 | 0.5 | 4.833 | A |
| 2 - Pontrypridd Road | 632 | 708 | 1406 | 0.449 | 631 | 0.8 | 4.639 | A |
| 3 - Port Road West | 804 | 456 | 1273 | 0.632 | 801 | 1.7 | 7.592 | A |
| 4 - Waycock Road (Five Mile Lane) | 659 | 506 | 1760 | 0.374 | 658 | 0.6 | 3.264 | A |

### 08:15 - 08:30

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 487 | 1045 | 1032 | 0.471 | 485 | 0.9 | 6.561 | A |
| 2 - Pontrypridd Road | 774 | 867 | 1306 | 0.593 | 772 | 1.4 | 6.707 | A |
| 3 - Port Road West | 984 | 558 | 1215 | 0.810 | 975 | 3.9 | 14.482 | B |
| 4 - Waycock Road (Five Mile Lane) | 807 | 617 | 1681 | 0.480 | 806 | 0.9 | 4.109 | A |

### 08:30 - 08:45

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 487 | 1049 | 1030 | 0.472 | 487 | 0.9 | 6.620 | A |
| 2 - Pontrypridd Road | 774 | 869 | 1305 | 0.593 | 774 | 1.4 | 6.781 | A |
| 3 - Port Road West | 984 | 559 | 1214 | 0.811 | 984 | 4.1 | 15.500 | C |
| 4 - Waycock Road (Five Mile Lane) | 807 | 622 | 1677 | 0.481 | 807 | 0.9 | 4.137 | A |

**08:45 - 09:00**

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 397 | 861 | 1138 | 0.349 | 399 | 0.5 | 4.881 | A |
| 2 - Pontrypridd Road | 632 | 711 | 1404 | 0.450 | 634 | 0.8 | 4.692 | A |
| 3 - Port Road West | 804 | 458 | 1271 | 0.632 | 813 | 1.8 | 8.013 | A |
| 4 - Waycock Road (Five Mile Lane) | 659 | 514 | 1755 | 0.375 | 660 | 0.6 | 3.290 | A |

**09:00 - 09:15**

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 333 | 719 | 1219 | 0.273 | 333 | 0.4 | 4.069 | A |
| 2 - Pontrypridd Road | 529 | 595 | 1478 | 0.358 | 530 | 0.6 | 3.802 | A |
| 3 - Port Road West | 673 | 383 | 1314 | 0.512 | 676 | 1.1 | 5.670 | A |
| 4 - Waycock Road (Five Mile Lane) | 552 | 427 | 1818 | 0.304 | 553 | 0.4 | 2.845 | A |

# 2026 Base (commute trips 30% reduction), PM

### Data Errors and Warnings

| Severity | Area | Item | Description |
|---|---|---|---|
| Warning | Geometry | 1 - Port Road East - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |
| Warning | Geometry | 4 - Waycock Road (Five Mile Lane) - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |

## Junction Network

### Junctions

| Junction | Name | Junction type | Use circulating lanes | Arm order | Junction Delay (s) | Junction LOS |
|---|---|---|---|---|---|---|
| 1 | Waycock Cross Roundabout | Standard Roundabout | | 1, 2, 3, 4 | 6.07 | A |

### Junction Network Options

| Driving side | Lighting |
|---|---|
| Left | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) |
|---|---|---|---|---|---|---|
| D3 | 2026 Base (commute trips 30% reduction) | PM | ONE HOUR | 16:30 | 18:00 | 15 |

| Vehicle mix source | PCU Factor for a HV (PCU) |
|---|---|
| HV Percentages | 2.00 |

### Demand overview (Traffic)

| Arm | Linked arm | Use O-D data | Average Demand (Veh/hr) | Scaling Factor (%) |
|---|---|---|---|---|
| 1 - Port Road East | | ✓ | 346 | 100.000 |
| 2 - Pontrypridd Road | | ✓ | 680 | 100.000 |
| 3 - Port Road West | | ✓ | 774 | 100.000 |
| 4 - Waycock Road (Five Mile Lane) | | ✓ | 863 | 100.000 |

## Origin-Destination Data

### Demand (Veh/hr)

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 43 | 247 | 56 |
| | 2 - Pontrypridd Road | 82 | 0 | 234 | 364 |
| | 3 - Port Road West | 192 | 247 | 0 | 335 |
| | 4 - Waycock Road (Five Mile Lane) | 134 | 336 | 393 | 0 |

## Vehicle Mix

### Heavy Vehicle Percentages

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 2 | 6 | 2 |
| | 2 - Pontrypridd Road | 1 | 0 | 2 | 2 |
| | 3 - Port Road West | 5 | 1 | 0 | 1 |
| | 4 - Waycock Road (Five Mile Lane) | 1 | 2 | 0 | 0 |

# Results

## Results Summary for whole modelled period

| Arm | Max RFC | Max Delay (s) | Max Queue (Veh) | Max LOS |
|---|---|---|---|---|
| 1 - Port Road East | 0.36 | 5.33 | 0.6 | A |
| 2 - Pontrypridd Road | 0.52 | 5.28 | 1.1 | A |
| 3 - Port Road West | 0.68 | 8.99 | 2.1 | A |
| 4 - Waycock Road (Five Mile Lane) | 0.54 | 4.37 | 1.1 | A |

## Main Results for each time segment

### 16:30 - 16:45

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 260 | 732 | 1252 | 0.208 | 259 | 0.3 | 3.622 | A |
| 2 - Pontrypridd Road | 512 | 522 | 1589 | 0.322 | 510 | 0.5 | 3.330 | A |
| 3 - Port Road West | 583 | 377 | 1350 | 0.432 | 580 | 0.8 | 4.659 | A |
| 4 - Waycock Road (Five Mile Lane) | 650 | 390 | 1906 | 0.341 | 648 | 0.5 | 2.855 | A |

### 16:45 - 17:00

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 311 | 876 | 1170 | 0.266 | 311 | 0.4 | 4.187 | A |
| 2 - Pontrypridd Road | 611 | 625 | 1523 | 0.402 | 611 | 0.7 | 3.944 | A |
| 3 - Port Road West | 696 | 451 | 1309 | 0.532 | 694 | 1.1 | 5.847 | A |
| 4 - Waycock Road (Five Mile Lane) | 776 | 467 | 1851 | 0.419 | 775 | 0.7 | 3.345 | A |

### 17:00 - 17:15

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 381 | 1072 | 1058 | 0.360 | 380 | 0.6 | 5.303 | A |
| 2 - Pontrypridd Road | 749 | 765 | 1432 | 0.523 | 747 | 1.1 | 5.244 | A |
| 3 - Port Road West | 852 | 551 | 1253 | 0.680 | 848 | 2.1 | 8.821 | A |
| 4 - Waycock Road (Five Mile Lane) | 950 | 571 | 1776 | 0.535 | 948 | 1.1 | 4.341 | A |

### 17:15 - 17:30

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 381 | 1075 | 1056 | 0.361 | 381 | 0.6 | 5.328 | A |
| 2 - Pontrypridd Road | 749 | 766 | 1431 | 0.523 | 749 | 1.1 | 5.276 | A |
| 3 - Port Road West | 852 | 553 | 1252 | 0.681 | 852 | 2.1 | 8.992 | A |
| 4 - Waycock Road (Five Mile Lane) | 950 | 574 | 1775 | 0.535 | 950 | 1.1 | 4.366 | A |

**17:30 - 17:45**

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 311 | 880 | 1168 | 0.266 | 312 | 0.4 | 4.210 | A |
| 2 - Pontrypridd Road | 611 | 627 | 1521 | 0.402 | 613 | 0.7 | 3.972 | A |
| 3 - Port Road West | 696 | 452 | 1308 | 0.532 | 700 | 1.2 | 5.959 | A |
| 4 - Waycock Road (Five Mile Lane) | 776 | 471 | 1848 | 0.420 | 777 | 0.7 | 3.368 | A |

**17:45 - 18:00**

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 260 | 736 | 1250 | 0.208 | 261 | 0.3 | 3.642 | A |
| 2 - Pontrypridd Road | 512 | 525 | 1588 | 0.322 | 513 | 0.5 | 3.351 | A |
| 3 - Port Road West | 583 | 379 | 1348 | 0.432 | 584 | 0.8 | 4.721 | A |
| 4 - Waycock Road (Five Mile Lane) | 650 | 393 | 1904 | 0.341 | 651 | 0.5 | 2.875 | A |

# 2026 Base (commute trips 30% reduction) + Dev (82,489m²), PM

### Data Errors and Warnings

| Severity | Area | Item | Description |
|---|---|---|---|
| Warning | Geometry | 1 - Port Road East - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |
| Warning | Geometry | 4 - Waycock Road (Five Mile Lane) - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |

## Junction Network

### Junctions

| Junction | Name | Junction type | Use circulating lanes | Arm order | Junction Delay (s) | Junction LOS |
|---|---|---|---|---|---|---|
| 1 | Waycock Cross Roundabout | Standard Roundabout | | 1, 2, 3, 4 | 8.28 | A |

### Junction Network Options

| Driving side | Lighting |
|---|---|
| Left | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) |
|---|---|---|---|---|---|---|
| D4 | 2026 Base (commute trips 30% reduction) + Dev (82,489m²) | PM | ONE HOUR | 16:30 | 18:00 | 15 |

| Vehicle mix source | PCU Factor for a HV (PCU) |
|---|---|
| HV Percentages | 2.00 |

### Demand overview (Traffic)

| Arm | Linked arm | Use O-D data | Average Demand (Veh/hr) | Scaling Factor (%) |
|---|---|---|---|---|
| 1 - Port Road East | | ✓ | 364 | 100.000 |
| 2 - Pontrypridd Road | | ✓ | 607 | 100.000 |
| 3 - Port Road West | | ✓ | 966 | 100.000 |
| 4 - Waycock Road (Five Mile Lane) | | ✓ | 807 | 100.000 |

## Origin-Destination Data

### Demand (Veh/hr)

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 47 | 271 | 46 |
| | 2 - Pontrypridd Road | 85 | 0 | 238 | 284 |
| | 3 - Port Road West | 292 | 271 | 0 | 403 |
| | 4 - Waycock Road (Five Mile Lane) | 99 | 310 | 398 | 0 |

## Vehicle Mix

### Heavy Vehicle Percentages

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 2 | 5 | 2 |
| | 2 - Pontrypridd Road | 2 | 0 | 1 | 2 |
| | 3 - Port Road West | 5 | 1 | 0 | 0 |
| | 4 - Waycock Road (Five Mile Lane) | 1 | 2 | 0 | 0 |

# Results

## Results Summary for whole modelled period

| Arm | Max RFC | Max Delay (s) | Max Queue (Veh) | Max LOS |
|---|---|---|---|---|
| 1 - Port Road East | 0.38 | 5.45 | 0.6 | A |
| 2 - Pontrypridd Road | 0.47 | 4.77 | 0.9 | A |
| 3 - Port Road West | 0.81 | 14.64 | 4.2 | B |
| 4 - Waycock Road (Five Mile Lane) | 0.53 | 4.59 | 1.1 | A |

## Main Results for each time segment

### 16:30 - 16:45

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 274 | 734 | 1259 | 0.218 | 273 | 0.3 | 3.648 | A |
| 2 - Pontrypridd Road | 457 | 536 | 1585 | 0.288 | 455 | 0.4 | 3.182 | A |
| 3 - Port Road West | 727 | 311 | 1388 | 0.524 | 723 | 1.1 | 5.378 | A |
| 4 - Waycock Road (Five Mile Lane) | 608 | 485 | 1837 | 0.331 | 606 | 0.5 | 2.917 | A |

### 16:45 - 17:00

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 327 | 879 | 1176 | 0.278 | 327 | 0.4 | 4.239 | A |
| 2 - Pontrypridd Road | 546 | 642 | 1517 | 0.360 | 545 | 0.6 | 3.704 | A |
| 3 - Port Road West | 868 | 373 | 1354 | 0.641 | 866 | 1.7 | 7.338 | A |
| 4 - Waycock Road (Five Mile Lane) | 725 | 581 | 1768 | 0.410 | 725 | 0.7 | 3.449 | A |

### 17:00 - 17:15

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 401 | 1074 | 1063 | 0.377 | 400 | 0.6 | 5.419 | A |
| 2 - Pontrypridd Road | 668 | 786 | 1423 | 0.470 | 667 | 0.9 | 4.752 | A |
| 3 - Port Road West | 1064 | 456 | 1308 | 0.813 | 1054 | 4.0 | 13.737 | B |
| 4 - Waycock Road (Five Mile Lane) | 889 | 708 | 1677 | 0.530 | 887 | 1.1 | 4.548 | A |

### 17:15 - 17:30

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 401 | 1078 | 1061 | 0.378 | 401 | 0.6 | 5.450 | A |
| 2 - Pontrypridd Road | 668 | 787 | 1422 | 0.470 | 668 | 0.9 | 4.773 | A |
| 3 - Port Road West | 1064 | 457 | 1307 | 0.814 | 1063 | 4.2 | 14.638 | B |
| 4 - Waycock Road (Five Mile Lane) | 889 | 713 | 1673 | 0.531 | 888 | 1.1 | 4.589 | A |

**17:30 - 17:45**

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 327 | 884 | 1172 | 0.279 | 328 | 0.4 | 4.268 | A |
| 2 - Pontrypridd Road | 546 | 644 | 1515 | 0.360 | 547 | 0.6 | 3.725 | A |
| 3 - Port Road West | 868 | 374 | 1353 | 0.642 | 878 | 1.8 | 7.716 | A |
| 4 - Waycock Road (Five Mile Lane) | 725 | 588 | 1763 | 0.412 | 727 | 0.7 | 3.480 | A |

**17:45 - 18:00**

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 274 | 739 | 1256 | 0.218 | 274 | 0.3 | 3.670 | A |
| 2 - Pontrypridd Road | 457 | 539 | 1583 | 0.289 | 458 | 0.4 | 3.199 | A |
| 3 - Port Road West | 727 | 313 | 1387 | 0.524 | 730 | 1.1 | 5.501 | A |
| 4 - Waycock Road (Five Mile Lane) | 608 | 490 | 1834 | 0.331 | 608 | 0.5 | 2.940 | A |

# Junctions 9

## ARCADY 9 - Roundabout Module

Version: 9.5.1.7462


**Filename:** Waycock Cross 2026 Commute Base 30% reduction plus Dev (171,890m²).j9
**Path:** P:\JNY9624 - Model Farm, Nr Cardiff\Transport\Arcady
**Report generation date:** 10/03/2021 14:49:18

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»2026 Base (commute trips 30% reduction) , AM
»2026 Base (commute trips 30% reduction) + Dev (171,890m²), AM
»2026 Base (commute trips 30% reduction) , PM
»2026 Base (commute trips 30% reduction) + Dev (171,890m²), PM

### Summary of junction performance

| | AM | | | PM | | |
|---|---|---|---|---|---|---|
| | Queue (Veh) | Delay (s) | RFC | Queue (Veh) | Delay (s) | RFC |
| | 2026 Base (commute trips 30% reduction) | | | | | |
| 1 - Port Road East | 0.6 | 5.41 | 0.37 | 0.6 | 5.33 | 0.36 |
| 2 - Pontrypridd Road | 1.2 | 5.45 | 0.55 | 1.1 | 5.28 | 0.52 |
| 3 - Port Road West | 3.5 | 13.93 | 0.78 | 2.1 | 8.99 | 0.68 |
| 4 - Waycock Road (Five Mile Lane) | 0.8 | 3.92 | 0.45 | 1.1 | 4.37 | 0.54 |
| | 2026 Base (commute trips 30% reduction) + Dev (171,890m²) | | | | | |
| 1 - Port Road East | 1.8 | 10.48 | 0.64 | 0.7 | 5.92 | 0.42 |
| 2 - Pontrypridd Road | 2.5 | 11.14 | 0.72 | 0.9 | 4.97 | 0.48 |
| 3 - Port Road West | 5.7 | 20.44 | 0.86 | 23.4 | 65.28 | 0.99 |
| 4 - Waycock Road (Five Mile Lane) | 1.3 | 5.04 | 0.57 | 1.3 | 5.29 | 0.57 |

*There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.*

*Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.*

### File summary

#### File Description

| | |
|---|---|
| Title | |
| Location | |
| Site number | |
| Date | 03/06/2019 |
| Version | |
| Status | (new file) |
| Identifier | |
| Client | |
| Jobnumber | |
| Enumerator | EUR\Alex.Snartt |
| Description | |

## Units

| Distance units | Speed units | Traffic units input | Traffic units results | Flow units | Average delay units | Total delay units | Rate of delay units |
|---|---|---|---|---|---|---|---|
| m | kph | Veh | Veh | perHour | s | -Min | perMin |

## Analysis Options

| Calculate Queue Percentiles | Calculate residual capacity | RFC Threshold | Average Delay threshold (s) | Queue threshold (PCU) |
|---|---|---|---|---|
| | | 0.85 | 36.00 | 20.00 |

## Demand Set Summary

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) |
|---|---|---|---|---|---|---|
| D1 | 2026 Base (commute trips 30% reduction) | AM | ONE HOUR | 07:45 | 09:15 | 15 |
| D2 | 2026 Base (commute trips 30% reduction) + Dev (171,890m²) | AM | ONE HOUR | 07:45 | 09:15 | 15 |
| D3 | 2026 Base (commute trips 30% reduction) | PM | ONE HOUR | 16:30 | 18:00 | 15 |
| D4 | 2026 Base (commute trips 30% reduction) + Dev (171,890m²) | PM | ONE HOUR | 16:30 | 18:00 | 15 |

## Analysis Set Details

| ID | Network flow scaling factor (%) |
|---|---|
| A1 | 100.000 |

# 2026 Base (commute trips 30% reduction) , AM

### Data Errors and Warnings

| Severity | Area | Item | Description |
|---|---|---|---|
| Warning | Geometry | 1 - Port Road East - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |
| Warning | Geometry | 4 - Waycock Road (Five Mile Lane) - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |

## Junction Network

### Junctions

| Junction | Name | Junction type | Use circulating lanes | Arm order | Junction Delay (s) | Junction LOS |
|---|---|---|---|---|---|---|
| 1 | Waycock Cross Roundabout | Standard Roundabout | | 1, 2, 3, 4 | 7.75 | A |

### Junction Network Options

| Driving side | Lighting |
|---|---|
| Left | Normal/unknown |

## Arms

### Arms

| Arm | Name | Description |
|---|---|---|
| 1 | Port Road East | |
| 2 | Pontrypridd Road | |
| 3 | Port Road West | |
| 4 | Waycock Road (Five Mile Lane) | |

### Roundabout Geometry

| Arm | V - Approach road half-width (m) | E - Entry width (m) | l' - Effective flare length (m) | R - Entry radius (m) | D - Inscribed circle diameter (m) | PHI - Conflict (entry) angle (deg) | Exit only |
|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 4.50 | 6.50 | 37.5 | 15.0 | 51.0 | 45.0 | |
| 2 - Pontrypridd Road | 6.25 | 7.00 | 3.0 | 20.0 | 51.0 | 38.0 | |
| 3 - Port Road West | 3.50 | 8.50 | 14.0 | 10.0 | 51.0 | 45.0 | |
| 4 - Waycock Road (Five Mile Lane) | 4.00 | 8.00 | 53.0 | 13.0 | 50.0 | 20.0 | |

### Slope / Intercept / Capacity

#### Roundabout Slope and Intercept used in model

| Arm | Final slope | Final intercept (PCU/hr) |
|---|---|---|
| 1 - Port Road East | 0.594 | 1753 |
| 2 - Pontrypridd Road | 0.646 | 1964 |
| 3 - Port Road West | 0.554 | 1589 |
| 4 - Waycock Road (Five Mile Lane) | 0.707 | 2207 |

*The slope and intercept shown above include any corrections and adjustments.*

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) |
|---|---|---|---|---|---|---|
| D1 | 2026 Base (commute trips 30% reduction) | AM | ONE HOUR | 07:45 | 09:15 | 15 |

| Vehicle mix source | PCU Factor for a HV (PCU) |
|---|---|
| HV Percentages | 2.00 |

### Demand overview (Traffic)

| Arm | Linked arm | Use O-D data | Average Demand (Veh/hr) | Scaling Factor (%) |
|---|---|---|---|---|
| 1 - Port Road East | | ✓ | 355 | 100.000 |
| 2 - Pontrypridd Road | | ✓ | 726 | 100.000 |
| 3 - Port Road West | | ✓ | 847 | 100.000 |
| 4 - Waycock Road (Five Mile Lane) | | ✓ | 677 | 100.000 |

## Origin-Destination Data

### Demand (Veh/hr)

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 43 | 220 | 92 |
| | 2 - Pontrypridd Road | 64 | 0 | 245 | 417 |
| | 3 - Port Road West | 231 | 278 | 0 | 338 |
| | 4 - Waycock Road (Five Mile Lane) | 78 | 332 | 267 | 0 |

## Vehicle Mix

### Heavy Vehicle Percentages

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 2 | 14 | 2 |
| | 2 - Pontrypridd Road | 1 | 0 | 2 | 7 |
| | 3 - Port Road West | 7 | 2 | 0 | 0 |
| | 4 - Waycock Road (Five Mile Lane) | 3 | 9 | 0 | 0 |

## Results

### Results Summary for whole modelled period

| Arm | Max RFC | Max Delay (s) | Max Queue (Veh) | Max LOS |
|---|---|---|---|---|
| 1 - Port Road East | 0.37 | 5.41 | 0.6 | A |
| 2 - Pontrypridd Road | 0.55 | 5.45 | 1.2 | A |
| 3 - Port Road West | 0.78 | 13.93 | 3.5 | B |
| 4 - Waycock Road (Five Mile Lane) | 0.45 | 3.92 | 0.8 | A |

### Main Results for each time segment

#### 07:45 - 08:00

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 267 | 658 | 1230 | 0.217 | 266 | 0.3 | 3.733 | A |
| 2 - Pontrypridd Road | 547 | 434 | 1592 | 0.343 | 544 | 0.5 | 3.430 | A |
| 3 - Port Road West | 638 | 430 | 1304 | 0.489 | 634 | 0.9 | 5.341 | A |
| 4 - Waycock Road (Five Mile Lane) | 510 | 429 | 1806 | 0.282 | 508 | 0.4 | 2.770 | A |

### 08:00 - 08:15

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 319 | 787 | 1157 | 0.276 | 319 | 0.4 | 4.295 | A |
| 2 - Pontrypridd Road | 653 | 520 | 1536 | 0.425 | 652 | 0.7 | 4.069 | A |
| 3 - Port Road West | 761 | 514 | 1256 | 0.606 | 759 | 1.5 | 7.215 | A |
| 4 - Waycock Road (Five Mile Lane) | 609 | 514 | 1746 | 0.349 | 608 | 0.5 | 3.161 | A |

### 08:15 - 08:30

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 391 | 962 | 1058 | 0.370 | 390 | 0.6 | 5.385 | A |
| 2 - Pontrypridd Road | 799 | 636 | 1460 | 0.547 | 797 | 1.2 | 5.418 | A |
| 3 - Port Road West | 933 | 629 | 1190 | 0.784 | 925 | 3.4 | 13.209 | B |
| 4 - Waycock Road (Five Mile Lane) | 745 | 626 | 1667 | 0.447 | 744 | 0.8 | 3.894 | A |

### 08:30 - 08:45

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 391 | 965 | 1056 | 0.370 | 391 | 0.6 | 5.413 | A |
| 2 - Pontrypridd Road | 799 | 637 | 1459 | 0.548 | 799 | 1.2 | 5.454 | A |
| 3 - Port Road West | 933 | 631 | 1189 | 0.784 | 932 | 3.5 | 13.926 | B |
| 4 - Waycock Road (Five Mile Lane) | 745 | 631 | 1664 | 0.448 | 745 | 0.8 | 3.917 | A |

### 08:45 - 09:00

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 319 | 792 | 1154 | 0.277 | 320 | 0.4 | 4.320 | A |
| 2 - Pontrypridd Road | 653 | 522 | 1535 | 0.425 | 654 | 0.7 | 4.099 | A |
| 3 - Port Road West | 761 | 517 | 1255 | 0.607 | 769 | 1.6 | 7.531 | A |
| 4 - Waycock Road (Five Mile Lane) | 609 | 520 | 1742 | 0.349 | 610 | 0.5 | 3.184 | A |

### 09:00 - 09:15

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 267 | 662 | 1228 | 0.218 | 268 | 0.3 | 3.751 | A |
| 2 - Pontrypridd Road | 547 | 437 | 1590 | 0.344 | 547 | 0.5 | 3.454 | A |
| 3 - Port Road West | 638 | 432 | 1303 | 0.489 | 640 | 1.0 | 5.451 | A |
| 4 - Waycock Road (Five Mile Lane) | 510 | 433 | 1803 | 0.283 | 510 | 0.4 | 2.785 | A |

# 2026 Base (commute trips 30% reduction) + Dev (171,890m²), AM

### Data Errors and Warnings

| Severity | Area | Item | Description |
|---|---|---|---|
| Warning | Geometry | 1 - Port Road East - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |
| Warning | Geometry | 4 - Waycock Road (Five Mile Lane) - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |

## Junction Network

### Junctions

| Junction | Name | Junction type | Use circulating lanes | Arm order | Junction Delay (s) | Junction LOS |
|---|---|---|---|---|---|---|
| 1 | Waycock Cross Roundabout | Standard Roundabout | | 1, 2, 3, 4 | 12.14 | B |

### Junction Network Options

| Driving side | Lighting |
|---|---|
| Left | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) |
|---|---|---|---|---|---|---|
| D2 | 2026 Base (commute trips 30% reduction) + Dev (171,890m²) | AM | ONE HOUR | 07:45 | 09:15 | 15 |

| Vehicle mix source | PCU Factor for a HV (PCU) |
|---|---|
| HV Percentages | 2.00 |

### Demand overview (Traffic)

| Arm | Linked arm | Use O-D data | Average Demand (Veh/hr) | Scaling Factor (%) |
|---|---|---|---|---|
| 1 - Port Road East | | ✓ | 555 | 100.000 |
| 2 - Pontrypridd Road | | ✓ | 741 | 100.000 |
| 3 - Port Road West | | ✓ | 951 | 100.000 |
| 4 - Waycock Road (Five Mile Lane) | | ✓ | 874 | 100.000 |

## Origin-Destination Data

### Demand (Veh/hr)

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 42 | 430 | 83 |
| | 2 - Pontrypridd Road | 44 | 0 | 316 | 381 |
| | 3 - Port Road West | 253 | 283 | 0 | 415 |
| | 4 - Waycock Road (Five Mile Lane) | 60 | 284 | 530 | 0 |

## Vehicle Mix

### Heavy Vehicle Percentages

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 8 | 7 | 2 |
| | 2 - Pontrypridd Road | 2 | 0 | 4 | 7 |
| | 3 - Port Road West | 11 | 2 | 0 | 0 |
| | 4 - Waycock Road (Five Mile Lane) | 3 | 9 | 0 | 0 |

# Results

## Results Summary for whole modelled period

| Arm | Max RFC | Max Delay (s) | Max Queue (Veh) | Max LOS |
|---|---|---|---|---|
| 1 - Port Road East | 0.64 | 10.48 | 1.8 | B |
| 2 - Pontrypridd Road | 0.72 | 11.14 | 2.5 | B |
| 3 - Port Road West | 0.86 | 20.44 | 5.7 | C |
| 4 - Waycock Road (Five Mile Lane) | 0.57 | 5.04 | 1.3 | A |

## Main Results for each time segment

### 07:45 - 08:00

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 418 | 822 | 1175 | 0.355 | 416 | 0.5 | 4.725 | A |
| 2 - Pontrypridd Road | 558 | 782 | 1369 | 0.407 | 555 | 0.7 | 4.407 | A |
| 3 - Port Road West | 716 | 381 | 1319 | 0.543 | 711 | 1.2 | 5.876 | A |
| 4 - Waycock Road (Five Mile Lane) | 658 | 434 | 1825 | 0.361 | 656 | 0.6 | 3.075 | A |

### 08:00 - 08:15

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 499 | 984 | 1082 | 0.461 | 498 | 0.8 | 6.146 | A |
| 2 - Pontrypridd Road | 666 | 936 | 1272 | 0.524 | 665 | 1.1 | 5.909 | A |
| 3 - Port Road West | 855 | 456 | 1277 | 0.670 | 852 | 2.0 | 8.401 | A |
| 4 - Waycock Road (Five Mile Lane) | 786 | 520 | 1762 | 0.446 | 785 | 0.8 | 3.679 | A |

### 08:15 - 08:30

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 611 | 1202 | 957 | 0.638 | 608 | 1.7 | 10.198 | B |
| 2 - Pontrypridd Road | 816 | 1144 | 1141 | 0.715 | 811 | 2.4 | 10.727 | B |
| 3 - Port Road West | 1047 | 556 | 1220 | 0.858 | 1034 | 5.3 | 18.132 | C |
| 4 - Waycock Road (Five Mile Lane) | 962 | 631 | 1682 | 0.572 | 960 | 1.3 | 4.976 | A |

### 08:30 - 08:45

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 611 | 1207 | 954 | 0.641 | 611 | 1.8 | 10.481 | B |
| 2 - Pontrypridd Road | 816 | 1148 | 1138 | 0.717 | 816 | 2.5 | 11.137 | B |
| 3 - Port Road West | 1047 | 559 | 1218 | 0.859 | 1046 | 5.7 | 20.436 | C |
| 4 - Waycock Road (Five Mile Lane) | 962 | 638 | 1677 | 0.574 | 962 | 1.3 | 5.039 | A |

**08:45 - 09:00**

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 499 | 992 | 1078 | 0.463 | 502 | 0.9 | 6.295 | A |
| 2 - Pontrypridd Road | 666 | 942 | 1268 | 0.525 | 672 | 1.1 | 6.088 | A |
| 3 - Port Road West | 855 | 460 | 1274 | 0.671 | 869 | 2.1 | 9.182 | A |
| 4 - Waycock Road (Five Mile Lane) | 786 | 530 | 1755 | 0.448 | 788 | 0.8 | 3.732 | A |

**09:00 - 09:15**

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 418 | 828 | 1172 | 0.356 | 419 | 0.6 | 4.789 | A |
| 2 - Pontrypridd Road | 558 | 787 | 1366 | 0.408 | 560 | 0.7 | 4.474 | A |
| 3 - Port Road West | 716 | 384 | 1318 | 0.543 | 720 | 1.2 | 6.052 | A |
| 4 - Waycock Road (Five Mile Lane) | 658 | 439 | 1821 | 0.361 | 659 | 0.6 | 3.102 | A |

# 2026 Base (commute trips 30% reduction) , PM

### Data Errors and Warnings

| Severity | Area | Item | Description |
|---|---|---|---|
| Warning | Geometry | 1 - Port Road East - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |
| Warning | Geometry | 4 - Waycock Road (Five Mile Lane) - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |

## Junction Network

### Junctions

| Junction | Name | Junction type | Use circulating lanes | Arm order | Junction Delay (s) | Junction LOS |
|---|---|---|---|---|---|---|
| 1 | Waycock Cross Roundabout | Standard Roundabout | | 1, 2, 3, 4 | 6.07 | A |

### Junction Network Options

| Driving side | Lighting |
|---|---|
| Left | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) |
|---|---|---|---|---|---|---|
| D3 | 2026 Base (commute trips 30% reduction) | PM | ONE HOUR | 16:30 | 18:00 | 15 |

| Vehicle mix source | PCU Factor for a HV (PCU) |
|---|---|
| HV Percentages | 2.00 |

### Demand overview (Traffic)

| Arm | Linked arm | Use O-D data | Average Demand (Veh/hr) | Scaling Factor (%) |
|---|---|---|---|---|
| 1 - Port Road East | | ✓ | 346 | 100.000 |
| 2 - Pontrypridd Road | | ✓ | 680 | 100.000 |
| 3 - Port Road West | | ✓ | 774 | 100.000 |
| 4 - Waycock Road (Five Mile Lane) | | ✓ | 863 | 100.000 |

## Origin-Destination Data

### Demand (Veh/hr)

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 43 | 247 | 56 |
| | 2 - Pontrypridd Road | 82 | 0 | 234 | 364 |
| | 3 - Port Road West | 192 | 247 | 0 | 335 |
| | 4 - Waycock Road (Five Mile Lane) | 134 | 336 | 393 | 0 |

## Vehicle Mix

### Heavy Vehicle Percentages

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 2 | 6 | 2 |
| | 2 - Pontrypridd Road | 1 | 0 | 2 | 2 |
| | 3 - Port Road West | 5 | 1 | 0 | 1 |
| | 4 - Waycock Road (Five Mile Lane) | 1 | 2 | 0 | 0 |

# Results

## Results Summary for whole modelled period

| Arm | Max RFC | Max Delay (s) | Max Queue (Veh) | Max LOS |
|---|---|---|---|---|
| 1 - Port Road East | 0.36 | 5.33 | 0.6 | A |
| 2 - Pontrypridd Road | 0.52 | 5.28 | 1.1 | A |
| 3 - Port Road West | 0.68 | 8.99 | 2.1 | A |
| 4 - Waycock Road (Five Mile Lane) | 0.54 | 4.37 | 1.1 | A |

## Main Results for each time segment

### 16:30 - 16:45

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 260 | 732 | 1252 | 0.208 | 259 | 0.3 | 3.622 | A |
| 2 - Pontrypridd Road | 512 | 522 | 1589 | 0.322 | 510 | 0.5 | 3.330 | A |
| 3 - Port Road West | 583 | 377 | 1350 | 0.432 | 580 | 0.8 | 4.659 | A |
| 4 - Waycock Road (Five Mile Lane) | 650 | 390 | 1906 | 0.341 | 648 | 0.5 | 2.855 | A |

### 16:45 - 17:00

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 311 | 876 | 1170 | 0.266 | 311 | 0.4 | 4.187 | A |
| 2 - Pontrypridd Road | 611 | 625 | 1523 | 0.402 | 611 | 0.7 | 3.944 | A |
| 3 - Port Road West | 696 | 451 | 1309 | 0.532 | 694 | 1.1 | 5.847 | A |
| 4 - Waycock Road (Five Mile Lane) | 776 | 467 | 1851 | 0.419 | 775 | 0.7 | 3.345 | A |

### 17:00 - 17:15

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 381 | 1072 | 1058 | 0.360 | 380 | 0.6 | 5.303 | A |
| 2 - Pontrypridd Road | 749 | 765 | 1432 | 0.523 | 747 | 1.1 | 5.244 | A |
| 3 - Port Road West | 852 | 551 | 1253 | 0.680 | 848 | 2.1 | 8.821 | A |
| 4 - Waycock Road (Five Mile Lane) | 950 | 571 | 1776 | 0.535 | 948 | 1.1 | 4.341 | A |

### 17:15 - 17:30

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 381 | 1075 | 1056 | 0.361 | 381 | 0.6 | 5.328 | A |
| 2 - Pontrypridd Road | 749 | 766 | 1431 | 0.523 | 749 | 1.1 | 5.276 | A |
| 3 - Port Road West | 852 | 553 | 1252 | 0.681 | 852 | 2.1 | 8.992 | A |
| 4 - Waycock Road (Five Mile Lane) | 950 | 574 | 1775 | 0.535 | 950 | 1.1 | 4.366 | A |

**17:30 - 17:45**

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 311 | 880 | 1168 | 0.266 | 312 | 0.4 | 4.210 | A |
| 2 - Pontrypridd Road | 611 | 627 | 1521 | 0.402 | 613 | 0.7 | 3.972 | A |
| 3 - Port Road West | 696 | 452 | 1308 | 0.532 | 700 | 1.2 | 5.959 | A |
| 4 - Waycock Road (Five Mile Lane) | 776 | 471 | 1848 | 0.420 | 777 | 0.7 | 3.368 | A |

**17:45 - 18:00**

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 260 | 736 | 1250 | 0.208 | 261 | 0.3 | 3.642 | A |
| 2 - Pontrypridd Road | 512 | 525 | 1588 | 0.322 | 513 | 0.5 | 3.351 | A |
| 3 - Port Road West | 583 | 379 | 1348 | 0.432 | 584 | 0.8 | 4.721 | A |
| 4 - Waycock Road (Five Mile Lane) | 650 | 393 | 1904 | 0.341 | 651 | 0.5 | 2.875 | A |

# 2026 Base (commute trips 30% reduction) + Dev (171,890m²), PM

### Data Errors and Warnings

| Severity | Area | Item | Description |
|---|---|---|---|
| Warning | Geometry | 1 - Port Road East - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |
| Warning | Geometry | 4 - Waycock Road (Five Mile Lane) - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |

## Junction Network

### Junctions

| Junction | Name | Junction type | Use circulating lanes | Arm order | Junction Delay (s) | Junction LOS |
|---|---|---|---|---|---|---|
| 1 | Waycock Cross Roundabout | Standard Roundabout | | 1, 2, 3, 4 | 28.88 | D |

### Junction Network Options

| Driving side | Lighting |
|---|---|
| Left | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) |
|---|---|---|---|---|---|---|
| D4 | 2026 Base (commute trips 30% reduction) + Dev (171,890m²) | PM | ONE HOUR | 16:30 | 18:00 | 15 |

| Vehicle mix source | PCU Factor for a HV (PCU) |
|---|---|
| HV Percentages | 2.00 |

### Demand overview (Traffic)

| Arm | Linked arm | Use O-D data | Average Demand (Veh/hr) | Scaling Factor (%) |
|---|---|---|---|---|
| 1 - Port Road East | | ✓ | 395 | 100.000 |
| 2 - Pontrypridd Road | | ✓ | 613 | 100.000 |
| 3 - Port Road West | | ✓ | 1185 | 100.000 |
| 4 - Waycock Road (Five Mile Lane) | | ✓ | 813 | 100.000 |

## Origin-Destination Data

### Demand (Veh/hr)

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 52 | 297 | 46 |
| | 2 - Pontrypridd Road | 87 | 0 | 242 | 284 |
| | 3 - Port Road West | 405 | 299 | 0 | 481 |
| | 4 - Waycock Road (Five Mile Lane) | 99 | 310 | 404 | 0 |

## Vehicle Mix

### Heavy Vehicle Percentages

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 2 | 5 | 2 |
| | 2 - Pontrypridd Road | 2 | 0 | 1 | 2 |
| | 3 - Port Road West | 3 | 1 | 0 | 0 |
| | 4 - Waycock Road (Five Mile Lane) | 1 | 2 | 0 | 0 |

# Results

## Results Summary for whole modelled period

| Arm | Max RFC | Max Delay (s) | Max Queue (Veh) | Max LOS |
|---|---|---|---|---|
| 1 - Port Road East | 0.42 | 5.92 | 0.7 | A |
| 2 - Pontrypridd Road | 0.48 | 4.97 | 0.9 | A |
| 3 - Port Road West | 0.99 | 65.28 | 23.4 | F |
| 4 - Waycock Road (Five Mile Lane) | 0.57 | 5.29 | 1.3 | A |

## Main Results for each time segment

### 16:30 - 16:45

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 297 | 759 | 1244 | 0.239 | 296 | 0.3 | 3.791 | A |
| 2 - Pontrypridd Road | 461 | 560 | 1569 | 0.294 | 460 | 0.4 | 3.241 | A |
| 3 - Port Road West | 892 | 313 | 1394 | 0.640 | 885 | 1.7 | 6.979 | A |
| 4 - Waycock Road (Five Mile Lane) | 612 | 591 | 1764 | 0.347 | 610 | 0.5 | 3.114 | A |

### 16:45 - 17:00

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 355 | 908 | 1158 | 0.307 | 355 | 0.4 | 4.475 | A |
| 2 - Pontrypridd Road | 551 | 671 | 1498 | 0.368 | 550 | 0.6 | 3.799 | A |
| 3 - Port Road West | 1065 | 374 | 1360 | 0.783 | 1059 | 3.4 | 11.687 | B |
| 4 - Waycock Road (Five Mile Lane) | 731 | 707 | 1681 | 0.435 | 730 | 0.8 | 3.780 | A |

### 17:00 - 17:15

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 435 | 1100 | 1048 | 0.415 | 434 | 0.7 | 5.851 | A |
| 2 - Pontrypridd Road | 675 | 821 | 1400 | 0.482 | 674 | 0.9 | 4.944 | A |
| 3 - Port Road West | 1305 | 458 | 1313 | 0.994 | 1251 | 16.9 | 40.031 | E |
| 4 - Waycock Road (Five Mile Lane) | 895 | 839 | 1587 | 0.564 | 893 | 1.3 | 5.171 | A |

### 17:15 - 17:30

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 435 | 1109 | 1043 | 0.417 | 435 | 0.7 | 5.918 | A |
| 2 - Pontrypridd Road | 675 | 822 | 1399 | 0.482 | 675 | 0.9 | 4.969 | A |
| 3 - Port Road West | 1305 | 459 | 1313 | 0.994 | 1279 | 23.4 | 65.281 | F |
| 4 - Waycock Road (Five Mile Lane) | 895 | 856 | 1575 | 0.568 | 895 | 1.3 | 5.292 | A |

**17:30 - 17:45**

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 355 | 932 | 1145 | 0.310 | 356 | 0.5 | 4.572 | A |
| 2 - Pontrypridd Road | 551 | 673 | 1496 | 0.368 | 552 | 0.6 | 3.820 | A |
| 3 - Port Road West | 1065 | 376 | 1359 | 0.784 | 1143 | 3.9 | 21.853 | C |
| 4 - Waycock Road (Five Mile Lane) | 731 | 758 | 1645 | 0.444 | 733 | 0.8 | 3.956 | A |

**17:45 - 18:00**

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 297 | 766 | 1240 | 0.240 | 298 | 0.3 | 3.823 | A |
| 2 - Pontrypridd Road | 461 | 563 | 1567 | 0.294 | 462 | 0.4 | 3.261 | A |
| 3 - Port Road West | 892 | 314 | 1393 | 0.640 | 900 | 1.8 | 7.419 | A |
| 4 - Waycock Road (Five Mile Lane) | 612 | 601 | 1757 | 0.348 | 613 | 0.5 | 3.148 | A |

# Junctions 9

## ARCADY 9 - Roundabout Module

Version: 9.5.1.7462


For sales and distribution information, program advice and maintenance, contact TRL:
+44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk



**Filename:** Waycock Cross 2026 Commute Base 30% reduction plus Dev (189,725m²).j9
**Path:** P:\JNY9624 - Model Farm, Nr Cardiff\Transport\Arcady
**Report generation date:** 10/03/2021 14:40:21

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»2026 Base (commute trips 30% reduction), AM
»2026 Base (commute trips 30% reduction) + Dev (189,725m²), AM
»2026 Base (commute trips 30% reduction), PM
»2026 Base (commute trips 30% reduction) + Dev (189,725m²), PM

### Summary of junction performance

| | AM | | | PM | | |
|---|---|---|---|---|---|---|
| | Queue (Veh) | Delay (s) | RFC | Queue (Veh) | Delay (s) | RFC |
| | 2026 Base (commute trips 30% reduction) | | | | | |
| 1 - Port Road East | 0.6 | 5.41 | 0.37 | 0.6 | 5.33 | 0.36 |
| 2 - Pontrypridd Road | 1.2 | 5.45 | 0.55 | 1.1 | 5.28 | 0.52 |
| 3 - Port Road West | 3.5 | 13.93 | 0.78 | 2.1 | 8.99 | 0.68 |
| 4 - Waycock Road (Five Mile Lane) | 0.8 | 3.92 | 0.45 | 1.1 | 4.37 | 0.54 |
| | 2026 Base (commute trips 30% reduction) + Dev (189,725m²) | | | | | |
| 1 - Port Road East | 2.1 | 11.85 | 0.68 | 0.7 | 5.92 | 0.42 |
| 2 - Pontrypridd Road | 2.9 | 12.95 | 0.75 | 0.9 | 5.00 | 0.48 |
| 3 - Port Road West | 6.1 | 21.80 | 0.87 | 39.5 | 98.73 | 1.03 |
| 4 - Waycock Road (Five Mile Lane) | 1.5 | 5.29 | 0.59 | 1.3 | 5.39 | 0.57 |

*There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.*

*Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.*

### File summary

#### File Description

| | |
|---|---|
| Title | |
| Location | |
| Site number | |
| Date | 03/06/2019 |
| Version | |
| Status | (new file) |
| Identifier | |
| Client | |
| Jobnumber | |
| Enumerator | EUR\Alex.Snartt |
| Description | |

## Units

| Distance units | Speed units | Traffic units input | Traffic units results | Flow units | Average delay units | Total delay units | Rate of delay units |
|---|---|---|---|---|---|---|---|
| m | kph | Veh | Veh | perHour | s | -Min | perMin |

## Analysis Options

| Calculate Queue Percentiles | Calculate residual capacity | RFC Threshold | Average Delay threshold (s) | Queue threshold (PCU) |
|---|---|---|---|---|
| | | 0.85 | 36.00 | 20.00 |

## Demand Set Summary

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) |
|---|---|---|---|---|---|---|
| D1 | 2026 Base (commute trips 30% reduction) | AM | ONE HOUR | 07:45 | 09:15 | 15 |
| D2 | 2026 Base (commute trips 30% reduction) + Dev (189,725m²) | AM | ONE HOUR | 07:45 | 09:15 | 15 |
| D3 | 2026 Base (commute trips 30% reduction) | PM | ONE HOUR | 16:30 | 18:00 | 15 |
| D4 | 2026 Base (commute trips 30% reduction) + Dev (189,725m²) | PM | ONE HOUR | 16:30 | 18:00 | 15 |

## Analysis Set Details

| ID | Network flow scaling factor (%) |
|---|---|
| A1 | 100.000 |

# 2026 Base (commute trips 30% reduction), AM

### Data Errors and Warnings

| Severity | Area | Item | Description |
|---|---|---|---|
| Warning | Geometry | 1 - Port Road East - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |
| Warning | Geometry | 4 - Waycock Road (Five Mile Lane) - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |

## Junction Network

### Junctions

| Junction | Name | Junction type | Use circulating lanes | Arm order | Junction Delay (s) | Junction LOS |
|---|---|---|---|---|---|---|
| 1 | Waycock Cross Roundabout | Standard Roundabout | | 1, 2, 3, 4 | 7.75 | A |

### Junction Network Options

| Driving side | Lighting |
|---|---|
| Left | Normal/unknown |

## Arms

### Arms

| Arm | Name | Description |
|---|---|---|
| 1 | Port Road East | |
| 2 | Pontrypridd Road | |
| 3 | Port Road West | |
| 4 | Waycock Road (Five Mile Lane) | |

### Roundabout Geometry

| Arm | V - Approach road half-width (m) | E - Entry width (m) | l' - Effective flare length (m) | R - Entry radius (m) | D - Inscribed circle diameter (m) | PHI - Conflict (entry) angle (deg) | Exit only |
|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 4.50 | 6.50 | 37.5 | 15.0 | 51.0 | 45.0 | |
| 2 - Pontrypridd Road | 6.25 | 7.00 | 3.0 | 20.0 | 51.0 | 38.0 | |
| 3 - Port Road West | 3.50 | 8.50 | 14.0 | 10.0 | 51.0 | 45.0 | |
| 4 - Waycock Road (Five Mile Lane) | 4.00 | 8.00 | 53.0 | 13.0 | 50.0 | 20.0 | |

### Slope / Intercept / Capacity

#### Roundabout Slope and Intercept used in model

| Arm | Final slope | Final intercept (PCU/hr) |
|---|---|---|
| 1 - Port Road East | 0.594 | 1753 |
| 2 - Pontrypridd Road | 0.646 | 1964 |
| 3 - Port Road West | 0.554 | 1589 |
| 4 - Waycock Road (Five Mile Lane) | 0.707 | 2207 |

*The slope and intercept shown above include any corrections and adjustments.*

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) |
|---|---|---|---|---|---|---|
| D1 | 2026 Base (commute trips 30% reduction) | AM | ONE HOUR | 07:45 | 09:15 | 15 |

| Vehicle mix source | PCU Factor for a HV (PCU) |
|---|---|
| HV Percentages | 2.00 |

### Demand overview (Traffic)

| Arm | Linked arm | Use O-D data | Average Demand (Veh/hr) | Scaling Factor (%) |
|---|---|---|---|---|
| 1 - Port Road East | | ✓ | 355 | 100.000 |
| 2 - Pontrypridd Road | | ✓ | 726 | 100.000 |
| 3 - Port Road West | | ✓ | 847 | 100.000 |
| 4 - Waycock Road (Five Mile Lane) | | ✓ | 677 | 100.000 |

## Origin-Destination Data

### Demand (Veh/hr)

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 43 | 220 | 92 |
| | 2 - Pontrypridd Road | 64 | 0 | 245 | 417 |
| | 3 - Port Road West | 231 | 278 | 0 | 338 |
| | 4 - Waycock Road (Five Mile Lane) | 78 | 332 | 267 | 0 |

## Vehicle Mix

### Heavy Vehicle Percentages

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 2 | 14 | 2 |
| | 2 - Pontrypridd Road | 1 | 0 | 2 | 7 |
| | 3 - Port Road West | 7 | 2 | 0 | 0 |
| | 4 - Waycock Road (Five Mile Lane) | 3 | 9 | 0 | 0 |

## Results

### Results Summary for whole modelled period

| Arm | Max RFC | Max Delay (s) | Max Queue (Veh) | Max LOS |
|---|---|---|---|---|
| 1 - Port Road East | 0.37 | 5.41 | 0.6 | A |
| 2 - Pontrypridd Road | 0.55 | 5.45 | 1.2 | A |
| 3 - Port Road West | 0.78 | 13.93 | 3.5 | B |
| 4 - Waycock Road (Five Mile Lane) | 0.45 | 3.92 | 0.8 | A |

### Main Results for each time segment

#### 07:45 - 08:00

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 267 | 658 | 1230 | 0.217 | 266 | 0.3 | 3.733 | A |
| 2 - Pontrypridd Road | 547 | 434 | 1592 | 0.343 | 544 | 0.5 | 3.430 | A |
| 3 - Port Road West | 638 | 430 | 1304 | 0.489 | 634 | 0.9 | 5.341 | A |
| 4 - Waycock Road (Five Mile Lane) | 510 | 429 | 1806 | 0.282 | 508 | 0.4 | 2.770 | A |

### 08:00 - 08:15

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 319 | 787 | 1157 | 0.276 | 319 | 0.4 | 4.295 | A |
| 2 - Pontrypridd Road | 653 | 520 | 1536 | 0.425 | 652 | 0.7 | 4.069 | A |
| 3 - Port Road West | 761 | 514 | 1256 | 0.606 | 759 | 1.5 | 7.215 | A |
| 4 - Waycock Road (Five Mile Lane) | 609 | 514 | 1746 | 0.349 | 608 | 0.5 | 3.161 | A |

### 08:15 - 08:30

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 391 | 962 | 1058 | 0.370 | 390 | 0.6 | 5.385 | A |
| 2 - Pontrypridd Road | 799 | 636 | 1460 | 0.547 | 797 | 1.2 | 5.418 | A |
| 3 - Port Road West | 933 | 629 | 1190 | 0.784 | 925 | 3.4 | 13.209 | B |
| 4 - Waycock Road (Five Mile Lane) | 745 | 626 | 1667 | 0.447 | 744 | 0.8 | 3.894 | A |

### 08:30 - 08:45

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 391 | 965 | 1056 | 0.370 | 391 | 0.6 | 5.413 | A |
| 2 - Pontrypridd Road | 799 | 637 | 1459 | 0.548 | 799 | 1.2 | 5.454 | A |
| 3 - Port Road West | 933 | 631 | 1189 | 0.784 | 932 | 3.5 | 13.926 | B |
| 4 - Waycock Road (Five Mile Lane) | 745 | 631 | 1664 | 0.448 | 745 | 0.8 | 3.917 | A |

### 08:45 - 09:00

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 319 | 792 | 1154 | 0.277 | 320 | 0.4 | 4.320 | A |
| 2 - Pontrypridd Road | 653 | 522 | 1535 | 0.425 | 654 | 0.7 | 4.099 | A |
| 3 - Port Road West | 761 | 517 | 1255 | 0.607 | 769 | 1.6 | 7.531 | A |
| 4 - Waycock Road (Five Mile Lane) | 609 | 520 | 1742 | 0.349 | 610 | 0.5 | 3.184 | A |

### 09:00 - 09:15

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 267 | 662 | 1228 | 0.218 | 268 | 0.3 | 3.751 | A |
| 2 - Pontrypridd Road | 547 | 437 | 1590 | 0.344 | 547 | 0.5 | 3.454 | A |
| 3 - Port Road West | 638 | 432 | 1303 | 0.489 | 640 | 1.0 | 5.451 | A |
| 4 - Waycock Road (Five Mile Lane) | 510 | 433 | 1803 | 0.283 | 510 | 0.4 | 2.785 | A |

# 2026 Base (commute trips 30% reduction) + Dev (189,725m²), AM

### Data Errors and Warnings

| Severity | Area | Item | Description |
|---|---|---|---|
| Warning | Geometry | 1 - Port Road East - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |
| Warning | Geometry | 4 - Waycock Road (Five Mile Lane) - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |

## Junction Network

### Junctions

| Junction | Name | Junction type | Use circulating lanes | Arm order | Junction Delay (s) | Junction LOS |
|---|---|---|---|---|---|---|
| 1 | Waycock Cross Roundabout | Standard Roundabout | | 1, 2, 3, 4 | 13.25 | B |

### Junction Network Options

| Driving side | Lighting |
|---|---|
| Left | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) |
|---|---|---|---|---|---|---|
| D2 | 2026 Base (commute trips 30% reduction) + Dev (189,725m²) | AM | ONE HOUR | 07:45 | 09:15 | 15 |

| Vehicle mix source | PCU Factor for a HV (PCU) |
|---|---|
| HV Percentages | 2.00 |

### Demand overview (Traffic)

| Arm | Linked arm | Use O-D data | Average Demand (Veh/hr) | Scaling Factor (%) |
|---|---|---|---|---|
| 1 - Port Road East | | ✓ | 580 | 100.000 |
| 2 - Pontrypridd Road | | ✓ | 750 | 100.000 |
| 3 - Port Road West | | ✓ | 962 | 100.000 |
| 4 - Waycock Road (Five Mile Lane) | | ✓ | 905 | 100.000 |

## Origin-Destination Data

### Demand (Veh/hr)

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 42 | 455 | 83 |
| | 2 - Pontrypridd Road | 44 | 0 | 325 | 381 |
| | 3 - Port Road West | 255 | 283 | 0 | 424 |
| | 4 - Waycock Road (Five Mile Lane) | 60 | 284 | 561 | 0 |

## Vehicle Mix

### Heavy Vehicle Percentages

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 8 | 6 | 2 |
| | 2 - Pontrypridd Road | 2 | 0 | 4 | 7 |
| | 3 - Port Road West | 11 | 2 | 0 | 0 |
| | 4 - Waycock Road (Five Mile Lane) | 3 | 9 | 0 | 0 |

# Results

## Results Summary for whole modelled period

| Arm | Max RFC | Max Delay (s) | Max Queue (Veh) | Max LOS |
|---|---|---|---|---|
| 1 - Port Road East | 0.68 | 11.85 | 2.1 | B |
| 2 - Pontrypridd Road | 0.75 | 12.95 | 2.9 | B |
| 3 - Port Road West | 0.87 | 21.80 | 6.1 | C |
| 4 - Waycock Road (Five Mile Lane) | 0.59 | 5.29 | 1.5 | A |

## Main Results for each time segment

### 07:45 - 08:00

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 437 | 846 | 1171 | 0.373 | 434 | 0.6 | 4.873 | A |
| 2 - Pontrypridd Road | 565 | 824 | 1345 | 0.420 | 562 | 0.7 | 4.578 | A |
| 3 - Port Road West | 724 | 380 | 1320 | 0.549 | 719 | 1.2 | 5.942 | A |
| 4 - Waycock Road (Five Mile Lane) | 681 | 435 | 1825 | 0.373 | 679 | 0.6 | 3.133 | A |

### 08:00 - 08:15

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 521 | 1012 | 1074 | 0.485 | 520 | 0.9 | 6.478 | A |
| 2 - Pontrypridd Road | 674 | 986 | 1243 | 0.542 | 672 | 1.2 | 6.287 | A |
| 3 - Port Road West | 865 | 455 | 1277 | 0.677 | 861 | 2.0 | 8.588 | A |
| 4 - Waycock Road (Five Mile Lane) | 814 | 521 | 1763 | 0.461 | 813 | 0.9 | 3.785 | A |

### 08:15 - 08:30

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 639 | 1236 | 945 | 0.676 | 634 | 2.0 | 11.426 | B |
| 2 - Pontrypridd Road | 826 | 1205 | 1106 | 0.747 | 819 | 2.8 | 12.290 | B |
| 3 - Port Road West | 1059 | 555 | 1221 | 0.868 | 1045 | 5.7 | 19.042 | C |
| 4 - Waycock Road (Five Mile Lane) | 996 | 632 | 1682 | 0.592 | 994 | 1.4 | 5.214 | A |

### 08:30 - 08:45

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 639 | 1241 | 942 | 0.678 | 638 | 2.1 | 11.848 | B |
| 2 - Pontrypridd Road | 826 | 1210 | 1103 | 0.749 | 825 | 2.9 | 12.945 | B |
| 3 - Port Road West | 1059 | 559 | 1219 | 0.869 | 1057 | 6.1 | 21.796 | C |
| 4 - Waycock Road (Five Mile Lane) | 996 | 640 | 1677 | 0.594 | 996 | 1.5 | 5.290 | A |

**08:45 - 09:00**

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 521 | 1021 | 1069 | 0.488 | 526 | 1.0 | 6.676 | A |
| 2 - Pontrypridd Road | 674 | 993 | 1238 | 0.544 | 681 | 1.2 | 6.534 | A |
| 3 - Port Road West | 865 | 461 | 1274 | 0.679 | 880 | 2.2 | 9.490 | A |
| 4 - Waycock Road (Five Mile Lane) | 814 | 532 | 1755 | 0.464 | 816 | 0.9 | 3.843 | A |

**09:00 - 09:15**

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 437 | 851 | 1167 | 0.374 | 438 | 0.6 | 4.947 | A |
| 2 - Pontrypridd Road | 565 | 829 | 1342 | 0.421 | 567 | 0.7 | 4.655 | A |
| 3 - Port Road West | 724 | 384 | 1318 | 0.550 | 728 | 1.2 | 6.142 | A |
| 4 - Waycock Road (Five Mile Lane) | 681 | 440 | 1822 | 0.374 | 682 | 0.6 | 3.162 | A |

# 2026 Base (commute trips 30% reduction), PM

### Data Errors and Warnings

| Severity | Area | Item | Description |
|---|---|---|---|
| Warning | Geometry | 1 - Port Road East - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |
| Warning | Geometry | 4 - Waycock Road (Five Mile Lane) - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |

## Junction Network

### Junctions

| Junction | Name | Junction type | Use circulating lanes | Arm order | Junction Delay (s) | Junction LOS |
|---|---|---|---|---|---|---|
| 1 | Waycock Cross Roundabout | Standard Roundabout | | 1, 2, 3, 4 | 6.07 | A |

### Junction Network Options

| Driving side | Lighting |
|---|---|
| Left | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) |
|---|---|---|---|---|---|---|
| D3 | 2026 Base (commute trips 30% reduction) | PM | ONE HOUR | 16:30 | 18:00 | 15 |

| Vehicle mix source | PCU Factor for a HV (PCU) |
|---|---|
| HV Percentages | 2.00 |

### Demand overview (Traffic)

| Arm | Linked arm | Use O-D data | Average Demand (Veh/hr) | Scaling Factor (%) |
|---|---|---|---|---|
| 1 - Port Road East | | ✓ | 346 | 100.000 |
| 2 - Pontrypridd Road | | ✓ | 680 | 100.000 |
| 3 - Port Road West | | ✓ | 774 | 100.000 |
| 4 - Waycock Road (Five Mile Lane) | | ✓ | 863 | 100.000 |

## Origin-Destination Data

### Demand (Veh/hr)

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 43 | 247 | 56 |
| | 2 - Pontrypridd Road | 82 | 0 | 234 | 364 |
| | 3 - Port Road West | 192 | 247 | 0 | 335 |
| | 4 - Waycock Road (Five Mile Lane) | 134 | 336 | 393 | 0 |

## Vehicle Mix

### Heavy Vehicle Percentages

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 2 | 6 | 2 |
| | 2 - Pontrypridd Road | 1 | 0 | 2 | 2 |
| | 3 - Port Road West | 5 | 1 | 0 | 1 |
| | 4 - Waycock Road (Five Mile Lane) | 1 | 2 | 0 | 0 |

# Results

## Results Summary for whole modelled period

| Arm | Max RFC | Max Delay (s) | Max Queue (Veh) | Max LOS |
|---|---|---|---|---|
| 1 - Port Road East | 0.36 | 5.33 | 0.6 | A |
| 2 - Pontrypridd Road | 0.52 | 5.28 | 1.1 | A |
| 3 - Port Road West | 0.68 | 8.99 | 2.1 | A |
| 4 - Waycock Road (Five Mile Lane) | 0.54 | 4.37 | 1.1 | A |

## Main Results for each time segment

### 16:30 - 16:45

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 260 | 732 | 1252 | 0.208 | 259 | 0.3 | 3.622 | A |
| 2 - Pontrypridd Road | 512 | 522 | 1589 | 0.322 | 510 | 0.5 | 3.330 | A |
| 3 - Port Road West | 583 | 377 | 1350 | 0.432 | 580 | 0.8 | 4.659 | A |
| 4 - Waycock Road (Five Mile Lane) | 650 | 390 | 1906 | 0.341 | 648 | 0.5 | 2.855 | A |

### 16:45 - 17:00

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 311 | 876 | 1170 | 0.266 | 311 | 0.4 | 4.187 | A |
| 2 - Pontrypridd Road | 611 | 625 | 1523 | 0.402 | 611 | 0.7 | 3.944 | A |
| 3 - Port Road West | 696 | 451 | 1309 | 0.532 | 694 | 1.1 | 5.847 | A |
| 4 - Waycock Road (Five Mile Lane) | 776 | 467 | 1851 | 0.419 | 775 | 0.7 | 3.345 | A |

### 17:00 - 17:15

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 381 | 1072 | 1058 | 0.360 | 380 | 0.6 | 5.303 | A |
| 2 - Pontrypridd Road | 749 | 765 | 1432 | 0.523 | 747 | 1.1 | 5.244 | A |
| 3 - Port Road West | 852 | 551 | 1253 | 0.680 | 848 | 2.1 | 8.821 | A |
| 4 - Waycock Road (Five Mile Lane) | 950 | 571 | 1776 | 0.535 | 948 | 1.1 | 4.341 | A |

### 17:15 - 17:30

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 381 | 1075 | 1056 | 0.361 | 381 | 0.6 | 5.328 | A |
| 2 - Pontrypridd Road | 749 | 766 | 1431 | 0.523 | 749 | 1.1 | 5.276 | A |
| 3 - Port Road West | 852 | 553 | 1252 | 0.681 | 852 | 2.1 | 8.992 | A |
| 4 - Waycock Road (Five Mile Lane) | 950 | 574 | 1775 | 0.535 | 950 | 1.1 | 4.366 | A |

**17:30 - 17:45**

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 311 | 880 | 1168 | 0.266 | 312 | 0.4 | 4.210 | A |
| 2 - Pontrypridd Road | 611 | 627 | 1521 | 0.402 | 613 | 0.7 | 3.972 | A |
| 3 - Port Road West | 696 | 452 | 1308 | 0.532 | 700 | 1.2 | 5.959 | A |
| 4 - Waycock Road (Five Mile Lane) | 776 | 471 | 1848 | 0.420 | 777 | 0.7 | 3.368 | A |

**17:45 - 18:00**

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 260 | 736 | 1250 | 0.208 | 261 | 0.3 | 3.642 | A |
| 2 - Pontrypridd Road | 512 | 525 | 1588 | 0.322 | 513 | 0.5 | 3.351 | A |
| 3 - Port Road West | 583 | 379 | 1348 | 0.432 | 584 | 0.8 | 4.721 | A |
| 4 - Waycock Road (Five Mile Lane) | 650 | 393 | 1904 | 0.341 | 651 | 0.5 | 2.875 | A |

# 2026 Base (commute trips 30% reduction) + Dev (189,725m²), PM

### Data Errors and Warnings

| Severity | Area | Item | Description |
|---|---|---|---|
| Warning | Geometry | 1 - Port Road East - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |
| Warning | Geometry | 4 - Waycock Road (Five Mile Lane) - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |

## Junction Network

### Junctions

| Junction | Name | Junction type | Use circulating lanes | Arm order | Junction Delay (s) | Junction LOS |
|---|---|---|---|---|---|---|
| 1 | Waycock Cross Roundabout | Standard Roundabout | | 1, 2, 3, 4 | 42.84 | E |

### Junction Network Options

| Driving side | Lighting |
|---|---|
| Left | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) |
|---|---|---|---|---|---|---|
| D4 | 2026 Base (commute trips 30% reduction) + Dev (189,725m²) | PM | ONE HOUR | 16:30 | 18:00 | 15 |

| Vehicle mix source | PCU Factor for a HV (PCU) |
|---|---|
| HV Percentages | 2.00 |

### Demand overview (Traffic)

| Arm | Linked arm | Use O-D data | Average Demand (Veh/hr) | Scaling Factor (%) |
|---|---|---|---|---|
| 1 - Port Road East | | ✓ | 402 | 100.000 |
| 2 - Pontrypridd Road | | ✓ | 614 | 100.000 |
| 3 - Port Road West | | ✓ | 1232 | 100.000 |
| 4 - Waycock Road (Five Mile Lane) | | ✓ | 814 | 100.000 |

## Origin-Destination Data

### Demand (Veh/hr)

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 53 | 303 | 46 |
| | 2 - Pontrypridd Road | 88 | 0 | 242 | 284 |
| | 3 - Port Road West | 429 | 305 | 0 | 498 |
| | 4 - Waycock Road (Five Mile Lane) | 99 | 310 | 405 | 0 |

## Vehicle Mix

### Heavy Vehicle Percentages

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 2 | 4 | 2 |
| | 2 - Pontrypridd Road | 2 | 0 | 1 | 2 |
| | 3 - Port Road West | 3 | 1 | 0 | 0 |
| | 4 - Waycock Road (Five Mile Lane) | 1 | 2 | 0 | 0 |

# Results

## Results Summary for whole modelled period

| Arm | Max RFC | Max Delay (s) | Max Queue (Veh) | Max LOS |
|---|---|---|---|---|
| 1 - Port Road East | 0.42 | 5.92 | 0.7 | A |
| 2 - Pontrypridd Road | 0.48 | 5.00 | 0.9 | A |
| 3 - Port Road West | 1.03 | 98.73 | 39.5 | F |
| 4 - Waycock Road (Five Mile Lane) | 0.57 | 5.39 | 1.3 | A |

## Main Results for each time segment

### 16:30 - 16:45

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 303 | 764 | 1250 | 0.242 | 301 | 0.3 | 3.788 | A |
| 2 - Pontrypridd Road | 462 | 565 | 1567 | 0.295 | 461 | 0.4 | 3.249 | A |
| 3 - Port Road West | 928 | 314 | 1394 | 0.665 | 920 | 1.9 | 7.478 | A |
| 4 - Waycock Road (Five Mile Lane) | 613 | 614 | 1748 | 0.351 | 611 | 0.5 | 3.161 | A |

### 16:45 - 17:00

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 361 | 914 | 1164 | 0.311 | 361 | 0.4 | 4.482 | A |
| 2 - Pontrypridd Road | 552 | 677 | 1495 | 0.369 | 551 | 0.6 | 3.812 | A |
| 3 - Port Road West | 1108 | 375 | 1359 | 0.815 | 1099 | 4.1 | 13.399 | B |
| 4 - Waycock Road (Five Mile Lane) | 732 | 734 | 1662 | 0.440 | 731 | 0.8 | 3.861 | A |

### 17:00 - 17:15

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 443 | 1101 | 1055 | 0.419 | 442 | 0.7 | 5.855 | A |
| 2 - Pontrypridd Road | 676 | 828 | 1397 | 0.484 | 675 | 0.9 | 4.972 | A |
| 3 - Port Road West | 1356 | 459 | 1312 | 1.034 | 1273 | 24.9 | 52.552 | F |
| 4 - Waycock Road (Five Mile Lane) | 896 | 855 | 1575 | 0.569 | 894 | 1.3 | 5.270 | A |

### 17:15 - 17:30

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 443 | 1109 | 1051 | 0.421 | 443 | 0.7 | 5.919 | A |
| 2 - Pontrypridd Road | 676 | 830 | 1396 | 0.484 | 676 | 0.9 | 4.998 | A |
| 3 - Port Road West | 1356 | 460 | 1312 | 1.034 | 1298 | 39.5 | 98.727 | F |
| 4 - Waycock Road (Five Mile Lane) | 896 | 870 | 1564 | 0.573 | 896 | 1.3 | 5.386 | A |

### 17:30 - 17:45

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 361 | 953 | 1141 | 0.317 | 362 | 0.5 | 4.630 | A |
| 2 - Pontrypridd Road | 552 | 680 | 1493 | 0.370 | 553 | 0.6 | 3.836 | A |
| 3 - Port Road West | 1108 | 377 | 1358 | 0.815 | 1245 | 5.1 | 48.619 | E |
| 4 - Waycock Road (Five Mile Lane) | 732 | 821 | 1600 | 0.457 | 734 | 0.9 | 4.168 | A |

### 17:45 - 18:00

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 303 | 772 | 1246 | 0.243 | 303 | 0.3 | 3.823 | A |
| 2 - Pontrypridd Road | 462 | 569 | 1565 | 0.295 | 463 | 0.4 | 3.269 | A |
| 3 - Port Road West | 928 | 315 | 1393 | 0.666 | 940 | 2.0 | 8.146 | A |
| 4 - Waycock Road (Five Mile Lane) | 613 | 626 | 1739 | 0.352 | 614 | 0.5 | 3.205 | A |

# Junctions 9

## ARCADY 9 - Roundabout Module

Version: 9.5.1.7462


**Filename:** Waycock Cross 2026 Commute Base 20% reduction plus Dev (82,489m²).j9
**Path:** P:\JNY9624 - Model Farm, Nr Cardiff\Transport\Arcady
**Report generation date:** 10/03/2021 14:53:18

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»2026 Base (commute trips 20% reduction), AM
»2026 Base (commute trips 20% reduction) + Dev (82,489m²), AM
»2026 Base (commute trips 20% reduction), PM
»2026 Base (commute trips 20% reduction) + Dev (82,489m²), PM

### Summary of junction performance

| | AM | | | PM | | |
|---|---|---|---|---|---|---|
| | Queue (Veh) | Delay (s) | RFC | Queue (Veh) | Delay (s) | RFC |
| | 2026 Base (commute trips 20% reduction) | | | | | |
| 1 - Port Road East | 0.6 | 5.67 | 0.39 | 0.6 | 5.64 | 0.38 |
| 2 - Pontrypridd Road | 1.3 | 5.74 | 0.57 | 1.2 | 5.72 | 0.55 |
| 3 - Port Road West | 4.2 | 16.24 | 0.81 | 2.5 | 10.22 | 0.72 |
| 4 - Waycock Road (Five Mile Lane) | 0.9 | 4.09 | 0.47 | 1.3 | 4.70 | 0.56 |
| | 2026 Base (commute trips 20% reduction) + Dev (82,489m²) | | | | | |
| 1 - Port Road East | 1.0 | 7.01 | 0.49 | 0.7 | 5.85 | 0.40 |
| 2 - Pontrypridd Road | 1.6 | 7.26 | 0.62 | 1.0 | 5.14 | 0.50 |
| 3 - Port Road West | 5.0 | 18.49 | 0.84 | 5.4 | 18.29 | 0.85 |
| 4 - Waycock Road (Five Mile Lane) | 1.0 | 4.33 | 0.50 | 1.3 | 4.96 | 0.56 |

*There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.*

*Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.*

### File summary

#### File Description

| | |
|---|---|
| Title | |
| Location | |
| Site number | |
| Date | 03/06/2019 |
| Version | |
| Status | (new file) |
| Identifier | |
| Client | |
| Jobnumber | |
| Enumerator | EUR\Alex.Snartt |
| Description | |

## Units

| Distance units | Speed units | Traffic units input | Traffic units results | Flow units | Average delay units | Total delay units | Rate of delay units |
|---|---|---|---|---|---|---|---|
| m | kph | Veh | Veh | perHour | s | -Min | perMin |

## Analysis Options

| Calculate Queue Percentiles | Calculate residual capacity | RFC Threshold | Average Delay threshold (s) | Queue threshold (PCU) |
|---|---|---|---|---|
| | | 0.85 | 36.00 | 20.00 |

## Demand Set Summary

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) |
|---|---|---|---|---|---|---|
| D1 | 2026 Base (commute trips 20% reduction) | AM | ONE HOUR | 07:45 | 09:15 | 15 |
| D2 | 2026 Base (commute trips 20% reduction) + Dev (82,489m²) | AM | ONE HOUR | 07:45 | 09:15 | 15 |
| D3 | 2026 Base (commute trips 20% reduction) | PM | ONE HOUR | 16:30 | 18:00 | 15 |
| D4 | 2026 Base (commute trips 20% reduction) + Dev (82,489m²) | PM | ONE HOUR | 16:30 | 18:00 | 15 |

## Analysis Set Details

| ID | Network flow scaling factor (%) |
|---|---|
| A1 | 100.000 |

# 2026 Base (commute trips 20% reduction), AM

### Data Errors and Warnings

| Severity | Area | Item | Description |
|---|---|---|---|
| Warning | Geometry | 1 - Port Road East - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |
| Warning | Geometry | 4 - Waycock Road (Five Mile Lane) - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |

## Junction Network

### Junctions

| Junction | Name | Junction type | Use circulating lanes | Arm order | Junction Delay (s) | Junction LOS |
|---|---|---|---|---|---|---|
| 1 | Waycock Cross Roundabout | Standard Roundabout | | 1, 2, 3, 4 | 8.64 | A |

### Junction Network Options

| Driving side | Lighting |
|---|---|
| Left | Normal/unknown |

## Arms

### Arms

| Arm | Name | Description |
|---|---|---|
| 1 | Port Road East | |
| 2 | Pontrypridd Road | |
| 3 | Port Road West | |
| 4 | Waycock Road (Five Mile Lane) | |

### Roundabout Geometry

| Arm | V - Approach road half-width (m) | E - Entry width (m) | l' - Effective flare length (m) | R - Entry radius (m) | D - Inscribed circle diameter (m) | PHI - Conflict (entry) angle (deg) | Exit only |
|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 4.50 | 6.50 | 37.5 | 15.0 | 51.0 | 45.0 | |
| 2 - Pontrypridd Road | 6.25 | 7.00 | 3.0 | 20.0 | 51.0 | 38.0 | |
| 3 - Port Road West | 3.50 | 8.50 | 14.0 | 10.0 | 51.0 | 45.0 | |
| 4 - Waycock Road (Five Mile Lane) | 4.00 | 8.00 | 53.0 | 13.0 | 50.0 | 20.0 | |

### Slope / Intercept / Capacity

#### Roundabout Slope and Intercept used in model

| Arm | Final slope | Final intercept (PCU/hr) |
|---|---|---|
| 1 - Port Road East | 0.594 | 1753 |
| 2 - Pontrypridd Road | 0.646 | 1964 |
| 3 - Port Road West | 0.554 | 1589 |
| 4 - Waycock Road (Five Mile Lane) | 0.707 | 2207 |

*The slope and intercept shown above include any corrections and adjustments.*

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) |
|---|---|---|---|---|---|---|
| D1 | 2026 Base (commute trips 20% reduction) | AM | ONE HOUR | 07:45 | 09:15 | 15 |

| Vehicle mix source | PCU Factor for a HV (PCU) |
|---|---|
| HV Percentages | 2.00 |

### Demand overview (Traffic)

| Arm | Linked arm | Use O-D data | Average Demand (Veh/hr) | Scaling Factor (%) |
|---|---|---|---|---|
| 1 - Port Road East | | ✓ | 366 | 100.000 |
| 2 - Pontrypridd Road | | ✓ | 751 | 100.000 |
| 3 - Port Road West | | ✓ | 875 | 100.000 |
| 4 - Waycock Road (Five Mile Lane) | | ✓ | 700 | 100.000 |

## Origin-Destination Data

### Demand (Veh/hr)

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 44 | 227 | 95 |
| | 2 - Pontrypridd Road | 66 | 0 | 253 | 432 |
| | 3 - Port Road West | 239 | 287 | 0 | 349 |
| | 4 - Waycock Road (Five Mile Lane) | 81 | 343 | 276 | 0 |

## Vehicle Mix

### Heavy Vehicle Percentages

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 2 | 14 | 2 |
| | 2 - Pontrypridd Road | 1 | 0 | 2 | 6 |
| | 3 - Port Road West | 6 | 2 | 0 | 0 |
| | 4 - Waycock Road (Five Mile Lane) | 3 | 9 | 0 | 0 |

## Results

### Results Summary for whole modelled period

| Arm | Max RFC | Max Delay (s) | Max Queue (Veh) | Max LOS |
|---|---|---|---|---|
| 1 - Port Road East | 0.39 | 5.67 | 0.6 | A |
| 2 - Pontrypridd Road | 0.57 | 5.74 | 1.3 | A |
| 3 - Port Road West | 0.81 | 16.24 | 4.2 | C |
| 4 - Waycock Road (Five Mile Lane) | 0.47 | 4.09 | 0.9 | A |

### Main Results for each time segment

#### 07:45 - 08:00

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 276 | 679 | 1217 | 0.226 | 274 | 0.3 | 3.812 | A |
| 2 - Pontrypridd Road | 565 | 449 | 1591 | 0.355 | 563 | 0.5 | 3.495 | A |
| 3 - Port Road West | 659 | 445 | 1301 | 0.506 | 655 | 1.0 | 5.538 | A |
| 4 - Waycock Road (Five Mile Lane) | 527 | 443 | 1797 | 0.293 | 525 | 0.4 | 2.827 | A |

### 08:00 - 08:15

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 329 | 813 | 1142 | 0.288 | 329 | 0.4 | 4.425 | A |
| 2 - Pontrypridd Road | 675 | 537 | 1533 | 0.440 | 674 | 0.8 | 4.187 | A |
| 3 - Port Road West | 787 | 532 | 1251 | 0.629 | 784 | 1.7 | 7.666 | A |
| 4 - Waycock Road (Five Mile Lane) | 629 | 531 | 1736 | 0.363 | 629 | 0.6 | 3.250 | A |

### 08:15 - 08:30

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 403 | 993 | 1040 | 0.387 | 402 | 0.6 | 5.635 | A |
| 2 - Pontrypridd Road | 827 | 657 | 1454 | 0.569 | 825 | 1.3 | 5.700 | A |
| 3 - Port Road West | 963 | 651 | 1183 | 0.814 | 954 | 4.0 | 15.096 | C |
| 4 - Waycock Road (Five Mile Lane) | 771 | 646 | 1655 | 0.466 | 770 | 0.9 | 4.060 | A |

### 08:30 - 08:45

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 403 | 997 | 1038 | 0.388 | 403 | 0.6 | 5.670 | A |
| 2 - Pontrypridd Road | 827 | 658 | 1454 | 0.569 | 827 | 1.3 | 5.743 | A |
| 3 - Port Road West | 963 | 653 | 1183 | 0.815 | 963 | 4.2 | 16.242 | C |
| 4 - Waycock Road (Five Mile Lane) | 771 | 651 | 1651 | 0.467 | 771 | 0.9 | 4.087 | A |

### 08:45 - 09:00

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 329 | 819 | 1139 | 0.289 | 330 | 0.4 | 4.457 | A |
| 2 - Pontrypridd Road | 675 | 539 | 1532 | 0.441 | 677 | 0.8 | 4.222 | A |
| 3 - Port Road West | 787 | 535 | 1250 | 0.629 | 796 | 1.7 | 8.107 | A |
| 4 - Waycock Road (Five Mile Lane) | 629 | 538 | 1730 | 0.364 | 630 | 0.6 | 3.278 | A |

### 09:00 - 09:15

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 276 | 684 | 1215 | 0.227 | 276 | 0.3 | 3.837 | A |
| 2 - Pontrypridd Road | 565 | 451 | 1589 | 0.356 | 566 | 0.6 | 3.521 | A |
| 3 - Port Road West | 659 | 447 | 1299 | 0.507 | 662 | 1.0 | 5.669 | A |
| 4 - Waycock Road (Five Mile Lane) | 527 | 447 | 1794 | 0.294 | 528 | 0.4 | 2.846 | A |

# 2026 Base (commute trips 20% reduction) + Dev (82,489m²), AM

### Data Errors and Warnings

| Severity | Area | Item | Description |
|---|---|---|---|
| Warning | Geometry | 1 - Port Road East - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |
| Warning | Geometry | 4 - Waycock Road (Five Mile Lane) - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |

## Junction Network

### Junctions

| Junction | Name | Junction type | Use circulating lanes | Arm order | Junction Delay (s) | Junction LOS |
|---|---|---|---|---|---|---|
| 1 | Waycock Cross Roundabout | Standard Roundabout | | 1, 2, 3, 4 | 10.04 | B |

### Junction Network Options

| Driving side | Lighting |
|---|---|
| Left | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) |
|---|---|---|---|---|---|---|
| D2 | 2026 Base (commute trips 20% reduction) + Dev (82,489m²) | AM | ONE HOUR | 07:45 | 09:15 | 15 |

| Vehicle mix source | PCU Factor for a HV (PCU) |
|---|---|
| HV Percentages | 2.00 |

### Demand overview (Traffic)

| Arm | Linked arm | Use O-D data | Average Demand (Veh/hr) | Scaling Factor (%) |
|---|---|---|---|---|
| 1 - Port Road East | | ✓ | 454 | 100.000 |
| 2 - Pontrypridd Road | | ✓ | 728 | 100.000 |
| 3 - Port Road West | | ✓ | 923 | 100.000 |
| 4 - Waycock Road (Five Mile Lane) | | ✓ | 756 | 100.000 |

## Origin-Destination Data

### Demand (Veh/hr)

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 43 | 325 | 86 |
| | 2 - Pontrypridd Road | 46 | 0 | 286 | 396 |
| | 3 - Port Road West | 249 | 289 | 0 | 385 |
| | 4 - Waycock Road (Five Mile Lane) | 63 | 295 | 398 | 0 |

## Vehicle Mix

### Heavy Vehicle Percentages

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 7 | 9 | 2 |
| | 2 - Pontrypridd Road | 2 | 0 | 5 | 6 |
| | 3 - Port Road West | 11 | 2 | 0 | 0 |
| | 4 - Waycock Road (Five Mile Lane) | 3 | 9 | 0 | 0 |

# Results

## Results Summary for whole modelled period

| Arm | Max RFC | Max Delay (s) | Max Queue (Veh) | Max LOS |
|---|---|---|---|---|
| 1 - Port Road East | 0.49 | 7.01 | 1.0 | A |
| 2 - Pontrypridd Road | 0.62 | 7.26 | 1.6 | A |
| 3 - Port Road West | 0.84 | 18.49 | 5.0 | C |
| 4 - Waycock Road (Five Mile Lane) | 0.50 | 4.33 | 1.0 | A |

## Main Results for each time segment

### 07:45 - 08:00

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 342 | 736 | 1210 | 0.282 | 340 | 0.4 | 4.131 | A |
| 2 - Pontrypridd Road | 548 | 607 | 1478 | 0.371 | 546 | 0.6 | 3.852 | A |
| 3 - Port Road West | 695 | 396 | 1312 | 0.530 | 690 | 1.1 | 5.757 | A |
| 4 - Waycock Road (Five Mile Lane) | 569 | 437 | 1812 | 0.314 | 567 | 0.5 | 2.890 | A |

### 08:00 - 08:15

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 408 | 881 | 1127 | 0.362 | 407 | 0.6 | 4.998 | A |
| 2 - Pontrypridd Road | 654 | 726 | 1402 | 0.467 | 653 | 0.9 | 4.802 | A |
| 3 - Port Road West | 830 | 474 | 1268 | 0.655 | 827 | 1.8 | 8.111 | A |
| 4 - Waycock Road (Five Mile Lane) | 680 | 523 | 1749 | 0.389 | 679 | 0.6 | 3.361 | A |

### 08:15 - 08:30

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 500 | 1076 | 1016 | 0.492 | 498 | 1.0 | 6.937 | A |
| 2 - Pontrypridd Road | 802 | 889 | 1299 | 0.617 | 799 | 1.6 | 7.158 | A |
| 3 - Port Road West | 1016 | 579 | 1208 | 0.841 | 1005 | 4.7 | 16.790 | C |
| 4 - Waycock Road (Five Mile Lane) | 832 | 636 | 1668 | 0.499 | 831 | 1.0 | 4.294 | A |

### 08:30 - 08:45

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 500 | 1081 | 1013 | 0.493 | 500 | 1.0 | 7.014 | A |
| 2 - Pontrypridd Road | 802 | 891 | 1297 | 0.618 | 801 | 1.6 | 7.257 | A |
| 3 - Port Road West | 1016 | 581 | 1207 | 0.842 | 1015 | 5.0 | 18.490 | C |
| 4 - Waycock Road (Five Mile Lane) | 832 | 642 | 1663 | 0.500 | 832 | 1.0 | 4.331 | A |

**08:45 - 09:00**

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 408 | 888 | 1123 | 0.363 | 410 | 0.6 | 5.057 | A |
| 2 - Pontrypridd Road | 654 | 729 | 1400 | 0.468 | 657 | 0.9 | 4.865 | A |
| 3 - Port Road West | 830 | 477 | 1266 | 0.655 | 842 | 2.0 | 8.720 | A |
| 4 - Waycock Road (Five Mile Lane) | 680 | 532 | 1743 | 0.390 | 681 | 0.6 | 3.397 | A |

**09:00 - 09:15**

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 342 | 741 | 1207 | 0.283 | 343 | 0.4 | 4.167 | A |
| 2 - Pontrypridd Road | 548 | 610 | 1476 | 0.371 | 549 | 0.6 | 3.889 | A |
| 3 - Port Road West | 695 | 398 | 1310 | 0.530 | 698 | 1.1 | 5.912 | A |
| 4 - Waycock Road (Five Mile Lane) | 569 | 442 | 1808 | 0.315 | 570 | 0.5 | 2.908 | A |

# 2026 Base (commute trips 20% reduction), PM

### Data Errors and Warnings

| Severity | Area | Item | Description |
|---|---|---|---|
| Warning | Geometry | 1 - Port Road East - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |
| Warning | Geometry | 4 - Waycock Road (Five Mile Lane) - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |

## Junction Network

### Junctions

| Junction | Name | Junction type | Use circulating lanes | Arm order | Junction Delay (s) | Junction LOS |
|---|---|---|---|---|---|---|
| 1 | Waycock Cross Roundabout | Standard Roundabout | | 1, 2, 3, 4 | 6.69 | A |

### Junction Network Options

| Driving side | Lighting |
|---|---|
| Left | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) |
|---|---|---|---|---|---|---|
| D3 | 2026 Base (commute trips 20% reduction) | PM | ONE HOUR | 16:30 | 18:00 | 15 |

| Vehicle mix source | PCU Factor for a HV (PCU) |
|---|---|
| HV Percentages | 2.00 |

### Demand overview (Traffic)

| Arm | Linked arm | Use O-D data | Average Demand (Veh/hr) | Scaling Factor (%) |
|---|---|---|---|---|
| 1 - Port Road East | | ✓ | 362 | 100.000 |
| 2 - Pontrypridd Road | | ✓ | 710 | 100.000 |
| 3 - Port Road West | | ✓ | 808 | 100.000 |
| 4 - Waycock Road (Five Mile Lane) | | ✓ | 901 | 100.000 |

## Origin-Destination Data

### Demand (Veh/hr)

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 45 | 258 | 59 |
| | 2 - Pontrypridd Road | 86 | 0 | 244 | 380 |
| | 3 - Port Road West | 201 | 258 | 0 | 349 |
| | 4 - Waycock Road (Five Mile Lane) | 140 | 351 | 410 | 0 |

## Vehicle Mix

### Heavy Vehicle Percentages

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 2 | 5 | 2 |
| | 2 - Pontrypridd Road | 1 | 0 | 2 | 2 |
| | 3 - Port Road West | 4 | 1 | 0 | 1 |
| | 4 - Waycock Road (Five Mile Lane) | 1 | 2 | 0 | 0 |

# Results

## Results Summary for whole modelled period

| Arm | Max RFC | Max Delay (s) | Max Queue (Veh) | Max LOS |
|---|---|---|---|---|
| 1 - Port Road East | 0.38 | 5.64 | 0.6 | A |
| 2 - Pontrypridd Road | 0.55 | 5.72 | 1.2 | A |
| 3 - Port Road West | 0.72 | 10.22 | 2.5 | B |
| 4 - Waycock Road (Five Mile Lane) | 0.56 | 4.70 | 1.3 | A |

## Main Results for each time segment

### 16:30 - 16:45

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 273 | 764 | 1243 | 0.219 | 271 | 0.3 | 3.704 | A |
| 2 - Pontrypridd Road | 535 | 545 | 1575 | 0.339 | 532 | 0.5 | 3.447 | A |
| 3 - Port Road West | 608 | 394 | 1343 | 0.453 | 605 | 0.8 | 4.855 | A |
| 4 - Waycock Road (Five Mile Lane) | 678 | 408 | 1894 | 0.358 | 676 | 0.6 | 2.950 | A |

### 16:45 - 17:00

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 325 | 915 | 1156 | 0.282 | 325 | 0.4 | 4.331 | A |
| 2 - Pontrypridd Road | 638 | 653 | 1506 | 0.424 | 637 | 0.7 | 4.140 | A |
| 3 - Port Road West | 726 | 471 | 1300 | 0.559 | 725 | 1.2 | 6.235 | A |
| 4 - Waycock Road (Five Mile Lane) | 810 | 489 | 1837 | 0.441 | 809 | 0.8 | 3.500 | A |

### 17:00 - 17:15

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 399 | 1119 | 1038 | 0.384 | 398 | 0.6 | 5.611 | A |
| 2 - Pontrypridd Road | 782 | 799 | 1412 | 0.554 | 780 | 1.2 | 5.678 | A |
| 3 - Port Road West | 890 | 577 | 1242 | 0.716 | 885 | 2.4 | 9.953 | A |
| 4 - Waycock Road (Five Mile Lane) | 992 | 597 | 1759 | 0.564 | 990 | 1.3 | 4.668 | A |

### 17:15 - 17:30

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 399 | 1122 | 1036 | 0.385 | 399 | 0.6 | 5.642 | A |
| 2 - Pontrypridd Road | 782 | 800 | 1411 | 0.554 | 782 | 1.2 | 5.724 | A |
| 3 - Port Road West | 890 | 578 | 1241 | 0.717 | 889 | 2.5 | 10.224 | B |
| 4 - Waycock Road (Five Mile Lane) | 992 | 600 | 1757 | 0.565 | 992 | 1.3 | 4.704 | A |

**17:30 - 17:45**

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 325 | 919 | 1153 | 0.282 | 326 | 0.4 | 4.357 | A |
| 2 - Pontrypridd Road | 638 | 655 | 1504 | 0.424 | 640 | 0.7 | 4.175 | A |
| 3 - Port Road West | 726 | 473 | 1299 | 0.559 | 731 | 1.3 | 6.390 | A |
| 4 - Waycock Road (Five Mile Lane) | 810 | 493 | 1834 | 0.442 | 812 | 0.8 | 3.529 | A |

**17:45 - 18:00**

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 273 | 769 | 1240 | 0.220 | 273 | 0.3 | 3.723 | A |
| 2 - Pontrypridd Road | 535 | 548 | 1574 | 0.340 | 535 | 0.5 | 3.469 | A |
| 3 - Port Road West | 608 | 396 | 1342 | 0.453 | 610 | 0.8 | 4.931 | A |
| 4 - Waycock Road (Five Mile Lane) | 678 | 411 | 1892 | 0.359 | 679 | 0.6 | 2.970 | A |

# 2026 Base (commute trips 20% reduction) + Dev (82,489m²), PM

### Data Errors and Warnings

| Severity | Area | Item | Description |
|---|---|---|---|
| Warning | Geometry | 1 - Port Road East - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |
| Warning | Geometry | 4 - Waycock Road (Five Mile Lane) - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |

## Junction Network

### Junctions

| Junction | Name | Junction type | Use circulating lanes | Arm order | Junction Delay (s) | Junction LOS |
|---|---|---|---|---|---|---|
| 1 | Waycock Cross Roundabout | Standard Roundabout | | 1, 2, 3, 4 | 9.78 | A |

### Junction Network Options

| Driving side | Lighting |
|---|---|
| Left | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) |
|---|---|---|---|---|---|---|
| D4 | 2026 Base (commute trips 20% reduction) + Dev (82,489m²) | PM | ONE HOUR | 16:30 | 18:00 | 15 |

| Vehicle mix source | PCU Factor for a HV (PCU) |
|---|---|
| HV Percentages | 2.00 |

### Demand overview (Traffic)

| Arm | Linked arm | Use O-D data | Average Demand (Veh/hr) | Scaling Factor (%) |
|---|---|---|---|---|
| 1 - Port Road East | | ✓ | 380 | 100.000 |
| 2 - Pontrypridd Road | | ✓ | 636 | 100.000 |
| 3 - Port Road West | | ✓ | 1000 | 100.000 |
| 4 - Waycock Road (Five Mile Lane) | | ✓ | 845 | 100.000 |

## Origin-Destination Data

### Demand (Veh/hr)

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 49 | 282 | 49 |
| | 2 - Pontrypridd Road | 88 | 0 | 248 | 300 |
| | 3 - Port Road West | 300 | 282 | 0 | 418 |
| | 4 - Waycock Road (Five Mile Lane) | 105 | 325 | 415 | 0 |

## Vehicle Mix

### Heavy Vehicle Percentages

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 2 | 5 | 2 |
| | 2 - Pontrypridd Road | 2 | 0 | 1 | 2 |
| | 3 - Port Road West | 5 | 1 | 0 | 0 |
| | 4 - Waycock Road (Five Mile Lane) | 1 | 2 | 0 | 0 |

# Results

## Results Summary for whole modelled period

| Arm | Max RFC | Max Delay (s) | Max Queue (Veh) | Max LOS |
|---|---|---|---|---|
| 1 - Port Road East | 0.40 | 5.85 | 0.7 | A |
| 2 - Pontrypridd Road | 0.50 | 5.14 | 1.0 | A |
| 3 - Port Road West | 0.85 | 18.29 | 5.4 | C |
| 4 - Waycock Road (Five Mile Lane) | 0.56 | 4.96 | 1.3 | A |

## Main Results for each time segment

### 16:30 - 16:45

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 286 | 766 | 1241 | 0.231 | 285 | 0.3 | 3.762 | A |
| 2 - Pontrypridd Road | 479 | 560 | 1570 | 0.305 | 477 | 0.4 | 3.287 | A |
| 3 - Port Road West | 753 | 328 | 1379 | 0.546 | 748 | 1.2 | 5.664 | A |
| 4 - Waycock Road (Five Mile Lane) | 636 | 501 | 1825 | 0.348 | 634 | 0.5 | 3.016 | A |

### 16:45 - 17:00

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 342 | 917 | 1154 | 0.296 | 341 | 0.4 | 4.427 | A |
| 2 - Pontrypridd Road | 572 | 670 | 1499 | 0.382 | 571 | 0.6 | 3.879 | A |
| 3 - Port Road West | 899 | 392 | 1343 | 0.669 | 896 | 2.0 | 7.989 | A |
| 4 - Waycock Road (Five Mile Lane) | 760 | 600 | 1754 | 0.433 | 759 | 0.8 | 3.613 | A |

### 17:00 - 17:15

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 418 | 1120 | 1037 | 0.404 | 417 | 0.7 | 5.801 | A |
| 2 - Pontrypridd Road | 700 | 820 | 1401 | 0.500 | 699 | 1.0 | 5.113 | A |
| 3 - Port Road West | 1101 | 480 | 1294 | 0.851 | 1089 | 5.1 | 16.566 | C |
| 4 - Waycock Road (Five Mile Lane) | 930 | 730 | 1660 | 0.560 | 928 | 1.3 | 4.903 | A |

### 17:15 - 17:30

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 418 | 1125 | 1034 | 0.405 | 418 | 0.7 | 5.846 | A |
| 2 - Pontrypridd Road | 700 | 821 | 1400 | 0.500 | 700 | 1.0 | 5.141 | A |
| 3 - Port Road West | 1101 | 481 | 1294 | 0.851 | 1100 | 5.4 | 18.286 | C |
| 4 - Waycock Road (Five Mile Lane) | 930 | 737 | 1656 | 0.562 | 930 | 1.3 | 4.963 | A |

### 17:30 - 17:45

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 342 | 924 | 1150 | 0.297 | 343 | 0.4 | 4.468 | A |
| 2 - Pontrypridd Road | 572 | 672 | 1497 | 0.382 | 573 | 0.6 | 3.903 | A |
| 3 - Port Road West | 899 | 394 | 1342 | 0.670 | 912 | 2.1 | 8.609 | A |
| 4 - Waycock Road (Five Mile Lane) | 760 | 610 | 1747 | 0.435 | 762 | 0.8 | 3.659 | A |

### 17:45 - 18:00

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 286 | 771 | 1238 | 0.231 | 287 | 0.3 | 3.789 | A |
| 2 - Pontrypridd Road | 479 | 563 | 1568 | 0.305 | 480 | 0.4 | 3.311 | A |
| 3 - Port Road West | 753 | 330 | 1378 | 0.546 | 756 | 1.2 | 5.822 | A |
| 4 - Waycock Road (Five Mile Lane) | 636 | 507 | 1822 | 0.349 | 637 | 0.5 | 3.040 | A |

# Junctions 9

## ARCADY 9 - Roundabout Module



**Filename:** Waycock Cross 2026 Commute Base 20% reduction plus Dev (152,716m²).j9
**Path:** P:\JNY9624 - Model Farm, Nr Cardiff\Transport\Arcady
**Report generation date:** 10/03/2021 14:56:00

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»2026 Base (commute trips 20% reduction), AM
»2026 Base (commute trips 20% reduction + Dev (152,716m²), AM
»2026 Base (commute trips 20% reduction), PM
»2026 Base (commute trips 20% reduction + Dev (152,716m²), PM

### Summary of junction performance

| | AM | | | PM | | |
|---|---|---|---|---|---|---|
| | Queue (Veh) | Delay (s) | RFC | Queue (Veh) | Delay (s) | RFC |
| | 2026 Base (commute trips 20% reduction) | | | | | |
| 1 - Port Road East | 0.6 | 5.67 | 0.39 | 0.6 | 5.64 | 0.38 |
| 2 - Pontrypridd Road | 1.3 | 5.74 | 0.57 | 1.2 | 5.72 | 0.55 |
| 3 - Port Road West | 4.2 | 16.24 | 0.81 | 2.5 | 10.22 | 0.72 |
| 4 - Waycock Road (Five Mile Lane) | 0.9 | 4.09 | 0.47 | 1.3 | 4.70 | 0.56 |
| | 2026 Base (commute trips 20% reduction + Dev (152,716m²) | | | | | |
| 1 - Port Road East | 1.6 | 9.92 | 0.62 | 0.8 | 6.17 | 0.43 |
| 2 - Pontrypridd Road | 2.4 | 10.66 | 0.71 | 1.0 | 5.30 | 0.51 |
| 3 - Port Road West | 6.7 | 23.95 | 0.88 | 23.4 | 66.19 | 0.99 |
| 4 - Waycock Road (Five Mile Lane) | 1.3 | 5.07 | 0.57 | 1.4 | 5.59 | 0.59 |

*There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.*

*Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.*

### File summary

#### File Description

| | |
|---|---|
| Title | |
| Location | |
| Site number | |
| Date | 03/06/2019 |
| Version | |
| Status | (new file) |
| Identifier | |
| Client | |
| Jobnumber | |
| Enumerator | EUR\Alex.Snartt |
| Description | |

## Units

| Distance units | Speed units | Traffic units input | Traffic units results | Flow units | Average delay units | Total delay units | Rate of delay units |
|---|---|---|---|---|---|---|---|
| m | kph | Veh | Veh | perHour | s | -Min | perMin |

## Analysis Options

| Calculate Queue Percentiles | Calculate residual capacity | RFC Threshold | Average Delay threshold (s) | Queue threshold (PCU) |
|---|---|---|---|---|
| | | 0.85 | 36.00 | 20.00 |

## Demand Set Summary

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) |
|---|---|---|---|---|---|---|
| D1 | 2026 Base (commute trips 20% reduction) | AM | ONE HOUR | 07:45 | 09:15 | 15 |
| D2 | 2026 Base (commute trips 20% reduction + Dev (152,716m²) | AM | ONE HOUR | 07:45 | 09:15 | 15 |
| D3 | 2026 Base (commute trips 20% reduction) | PM | ONE HOUR | 16:30 | 18:00 | 15 |
| D4 | 2026 Base (commute trips 20% reduction + Dev (152,716m²) | PM | ONE HOUR | 16:30 | 18:00 | 15 |

## Analysis Set Details

| ID | Network flow scaling factor (%) |
|---|---|
| A1 | 100.000 |

# 2026 Base (commute trips 20% reduction), AM

### Data Errors and Warnings

| Severity | Area | Item | Description |
|---|---|---|---|
| Warning | Geometry | 1 - Port Road East - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |
| Warning | Geometry | 4 - Waycock Road (Five Mile Lane) - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |

## Junction Network

### Junctions

| Junction | Name | Junction type | Use circulating lanes | Arm order | Junction Delay (s) | Junction LOS |
|---|---|---|---|---|---|---|
| 1 | Waycock Cross Roundabout | Standard Roundabout | | 1, 2, 3, 4 | 8.64 | A |

### Junction Network Options

| Driving side | Lighting |
|---|---|
| Left | Normal/unknown |

## Arms

### Arms

| Arm | Name | Description |
|---|---|---|
| 1 | Port Road East | |
| 2 | Pontrypridd Road | |
| 3 | Port Road West | |
| 4 | Waycock Road (Five Mile Lane) | |

### Roundabout Geometry

| Arm | V - Approach road half-width (m) | E - Entry width (m) | l' - Effective flare length (m) | R - Entry radius (m) | D - Inscribed circle diameter (m) | PHI - Conflict (entry) angle (deg) | Exit only |
|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 4.50 | 6.50 | 37.5 | 15.0 | 51.0 | 45.0 | |
| 2 - Pontrypridd Road | 6.25 | 7.00 | 3.0 | 20.0 | 51.0 | 38.0 | |
| 3 - Port Road West | 3.50 | 8.50 | 14.0 | 10.0 | 51.0 | 45.0 | |
| 4 - Waycock Road (Five Mile Lane) | 4.00 | 8.00 | 53.0 | 13.0 | 50.0 | 20.0 | |

### Slope / Intercept / Capacity

#### Roundabout Slope and Intercept used in model

| Arm | Final slope | Final intercept (PCU/hr) |
|---|---|---|
| 1 - Port Road East | 0.594 | 1753 |
| 2 - Pontrypridd Road | 0.646 | 1964 |
| 3 - Port Road West | 0.554 | 1589 |
| 4 - Waycock Road (Five Mile Lane) | 0.707 | 2207 |

*The slope and intercept shown above include any corrections and adjustments.*

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) |
|---|---|---|---|---|---|---|
| D1 | 2026 Base (commute trips 20% reduction) | AM | ONE HOUR | 07:45 | 09:15 | 15 |

| Vehicle mix source | PCU Factor for a HV (PCU) |
|---|---|
| HV Percentages | 2.00 |

### Demand overview (Traffic)

| Arm | Linked arm | Use O-D data | Average Demand (Veh/hr) | Scaling Factor (%) |
|---|---|---|---|---|
| 1 - Port Road East | | ✓ | 366 | 100.000 |
| 2 - Pontrypridd Road | | ✓ | 751 | 100.000 |
| 3 - Port Road West | | ✓ | 875 | 100.000 |
| 4 - Waycock Road (Five Mile Lane) | | ✓ | 700 | 100.000 |

## Origin-Destination Data

### Demand (Veh/hr)

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 44 | 227 | 95 |
| | 2 - Pontrypridd Road | 66 | 0 | 253 | 432 |
| | 3 - Port Road West | 239 | 287 | 0 | 349 |
| | 4 - Waycock Road (Five Mile Lane) | 81 | 343 | 276 | 0 |

## Vehicle Mix

### Heavy Vehicle Percentages

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 2 | 14 | 2 |
| | 2 - Pontrypridd Road | 1 | 0 | 2 | 6 |
| | 3 - Port Road West | 6 | 2 | 0 | 0 |
| | 4 - Waycock Road (Five Mile Lane) | 3 | 9 | 0 | 0 |

## Results

### Results Summary for whole modelled period

| Arm | Max RFC | Max Delay (s) | Max Queue (Veh) | Max LOS |
|---|---|---|---|---|
| 1 - Port Road East | 0.39 | 5.67 | 0.6 | A |
| 2 - Pontrypridd Road | 0.57 | 5.74 | 1.3 | A |
| 3 - Port Road West | 0.81 | 16.24 | 4.2 | C |
| 4 - Waycock Road (Five Mile Lane) | 0.47 | 4.09 | 0.9 | A |

### Main Results for each time segment

#### 07:45 - 08:00

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 276 | 679 | 1217 | 0.226 | 274 | 0.3 | 3.812 | A |
| 2 - Pontrypridd Road | 565 | 449 | 1591 | 0.355 | 563 | 0.5 | 3.495 | A |
| 3 - Port Road West | 659 | 445 | 1301 | 0.506 | 655 | 1.0 | 5.538 | A |
| 4 - Waycock Road (Five Mile Lane) | 527 | 443 | 1797 | 0.293 | 525 | 0.4 | 2.827 | A |

### 08:00 - 08:15

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 329 | 813 | 1142 | 0.288 | 329 | 0.4 | 4.425 | A |
| 2 - Pontrypridd Road | 675 | 537 | 1533 | 0.440 | 674 | 0.8 | 4.187 | A |
| 3 - Port Road West | 787 | 532 | 1251 | 0.629 | 784 | 1.7 | 7.666 | A |
| 4 - Waycock Road (Five Mile Lane) | 629 | 531 | 1736 | 0.363 | 629 | 0.6 | 3.250 | A |

### 08:15 - 08:30

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 403 | 993 | 1040 | 0.387 | 402 | 0.6 | 5.635 | A |
| 2 - Pontrypridd Road | 827 | 657 | 1454 | 0.569 | 825 | 1.3 | 5.700 | A |
| 3 - Port Road West | 963 | 651 | 1183 | 0.814 | 954 | 4.0 | 15.096 | C |
| 4 - Waycock Road (Five Mile Lane) | 771 | 646 | 1655 | 0.466 | 770 | 0.9 | 4.060 | A |

### 08:30 - 08:45

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 403 | 997 | 1038 | 0.388 | 403 | 0.6 | 5.670 | A |
| 2 - Pontrypridd Road | 827 | 658 | 1454 | 0.569 | 827 | 1.3 | 5.743 | A |
| 3 - Port Road West | 963 | 653 | 1183 | 0.815 | 963 | 4.2 | 16.242 | C |
| 4 - Waycock Road (Five Mile Lane) | 771 | 651 | 1651 | 0.467 | 771 | 0.9 | 4.087 | A |

### 08:45 - 09:00

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 329 | 819 | 1139 | 0.289 | 330 | 0.4 | 4.457 | A |
| 2 - Pontrypridd Road | 675 | 539 | 1532 | 0.441 | 677 | 0.8 | 4.222 | A |
| 3 - Port Road West | 787 | 535 | 1250 | 0.629 | 796 | 1.7 | 8.107 | A |
| 4 - Waycock Road (Five Mile Lane) | 629 | 538 | 1730 | 0.364 | 630 | 0.6 | 3.278 | A |

### 09:00 - 09:15

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 276 | 684 | 1215 | 0.227 | 276 | 0.3 | 3.837 | A |
| 2 - Pontrypridd Road | 565 | 451 | 1589 | 0.356 | 566 | 0.6 | 3.521 | A |
| 3 - Port Road West | 659 | 447 | 1299 | 0.507 | 662 | 1.0 | 5.669 | A |
| 4 - Waycock Road (Five Mile Lane) | 527 | 447 | 1794 | 0.294 | 528 | 0.4 | 2.846 | A |

# 2026 Base (commute trips 20% reduction + Dev (152,716m²), AM

### Data Errors and Warnings

| Severity | Area | Item | Description |
|---|---|---|---|
| Warning | Geometry | 1 - Port Road East - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |
| Warning | Geometry | 4 - Waycock Road (Five Mile Lane) - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |

## Junction Network

### Junctions

| Junction | Name | Junction type | Use circulating lanes | Arm order | Junction Delay (s) | Junction LOS |
|---|---|---|---|---|---|---|
| 1 | Waycock Cross Roundabout | Standard Roundabout | | 1, 2, 3, 4 | 13.08 | B |

### Junction Network Options

| Driving side | Lighting |
|---|---|
| Left | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) |
|---|---|---|---|---|---|---|
| D2 | 2026 Base (commute trips 20% reduction + Dev (152,716m²) | AM | ONE HOUR | 07:45 | 09:15 | 15 |

| Vehicle mix source | PCU Factor for a HV (PCU) |
|---|---|
| HV Percentages | 2.00 |

### Demand overview (Traffic)

| Arm | Linked arm | Use O-D data | Average Demand (Veh/hr) | Scaling Factor (%) |
|---|---|---|---|---|
| 1 - Port Road East | | ✓ | 540 | 100.000 |
| 2 - Pontrypridd Road | | ✓ | 758 | 100.000 |
| 3 - Port Road West | | ✓ | 967 | 100.000 |
| 4 - Waycock Road (Five Mile Lane) | | ✓ | 864 | 100.000 |

## Origin-Destination Data

### Demand (Veh/hr)

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 43 | 411 | 86 |
| | 2 - Pontrypridd Road | 46 | 0 | 316 | 396 |
| | 3 - Port Road West | 258 | 292 | 0 | 417 |
| | 4 - Waycock Road (Five Mile Lane) | 63 | 295 | 506 | 0 |

## Vehicle Mix

### Heavy Vehicle Percentages

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 7 | 7 | 2 |
| | 2 - Pontrypridd Road | 2 | 0 | 4 | 6 |
| | 3 - Port Road West | 11 | 2 | 0 | 0 |
| | 4 - Waycock Road (Five Mile Lane) | 3 | 9 | 0 | 0 |

# Results

## Results Summary for whole modelled period

| Arm | Max RFC | Max Delay (s) | Max Queue (Veh) | Max LOS |
|---|---|---|---|---|
| 1 - Port Road East | 0.62 | 9.92 | 1.6 | A |
| 2 - Pontrypridd Road | 0.71 | 10.66 | 2.4 | B |
| 3 - Port Road West | 0.88 | 23.95 | 6.7 | C |
| 4 - Waycock Road (Five Mile Lane) | 0.57 | 5.07 | 1.3 | A |

## Main Results for each time segment

### 07:45 - 08:00

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 407 | 819 | 1178 | 0.345 | 404 | 0.5 | 4.642 | A |
| 2 - Pontrypridd Road | 571 | 752 | 1395 | 0.409 | 568 | 0.7 | 4.339 | A |
| 3 - Port Road West | 728 | 396 | 1312 | 0.555 | 723 | 1.2 | 6.061 | A |
| 4 - Waycock Road (Five Mile Lane) | 650 | 446 | 1813 | 0.359 | 648 | 0.6 | 3.085 | A |

### 08:00 - 08:15

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 485 | 981 | 1085 | 0.447 | 484 | 0.8 | 5.982 | A |
| 2 - Pontrypridd Road | 681 | 900 | 1301 | 0.524 | 680 | 1.1 | 5.780 | A |
| 3 - Port Road West | 869 | 474 | 1268 | 0.685 | 866 | 2.1 | 8.859 | A |
| 4 - Waycock Road (Five Mile Lane) | 777 | 534 | 1749 | 0.444 | 776 | 0.8 | 3.693 | A |

### 08:15 - 08:30

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 595 | 1197 | 961 | 0.619 | 591 | 1.6 | 9.672 | A |
| 2 - Pontrypridd Road | 835 | 1100 | 1174 | 0.711 | 829 | 2.4 | 10.296 | B |
| 3 - Port Road West | 1065 | 578 | 1210 | 0.880 | 1048 | 6.2 | 20.524 | C |
| 4 - Waycock Road (Five Mile Lane) | 951 | 647 | 1668 | 0.570 | 949 | 1.3 | 4.997 | A |

### 08:30 - 08:45

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 595 | 1203 | 957 | 0.621 | 594 | 1.6 | 9.919 | A |
| 2 - Pontrypridd Road | 835 | 1104 | 1172 | 0.712 | 834 | 2.4 | 10.657 | B |
| 3 - Port Road West | 1065 | 581 | 1208 | 0.881 | 1063 | 6.7 | 23.953 | C |
| 4 - Waycock Road (Five Mile Lane) | 951 | 655 | 1662 | 0.573 | 951 | 1.3 | 5.067 | A |

**08:45 - 09:00**

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 485 | 990 | 1080 | 0.450 | 489 | 0.8 | 6.123 | A |
| 2 - Pontrypridd Road | 681 | 906 | 1297 | 0.525 | 687 | 1.1 | 5.945 | A |
| 3 - Port Road West | 869 | 478 | 1266 | 0.687 | 887 | 2.3 | 9.922 | A |
| 4 - Waycock Road (Five Mile Lane) | 777 | 546 | 1740 | 0.446 | 779 | 0.8 | 3.753 | A |

**09:00 - 09:15**

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 407 | 825 | 1175 | 0.346 | 408 | 0.5 | 4.702 | A |
| 2 - Pontrypridd Road | 571 | 757 | 1392 | 0.410 | 572 | 0.7 | 4.403 | A |
| 3 - Port Road West | 728 | 399 | 1311 | 0.555 | 732 | 1.3 | 6.263 | A |
| 4 - Waycock Road (Five Mile Lane) | 650 | 451 | 1809 | 0.360 | 651 | 0.6 | 3.111 | A |

# 2026 Base (commute trips 20% reduction), PM

### Data Errors and Warnings

| Severity | Area | Item | Description |
|---|---|---|---|
| Warning | Geometry | 1 - Port Road East - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |
| Warning | Geometry | 4 - Waycock Road (Five Mile Lane) - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |

## Junction Network

### Junctions

| Junction | Name | Junction type | Use circulating lanes | Arm order | Junction Delay (s) | Junction LOS |
|---|---|---|---|---|---|---|
| 1 | Waycock Cross Roundabout | Standard Roundabout | | 1, 2, 3, 4 | 6.69 | A |

### Junction Network Options

| Driving side | Lighting |
|---|---|
| Left | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) |
|---|---|---|---|---|---|---|
| D3 | 2026 Base (commute trips 20% reduction) | PM | ONE HOUR | 16:30 | 18:00 | 15 |

| Vehicle mix source | PCU Factor for a HV (PCU) |
|---|---|
| HV Percentages | 2.00 |

### Demand overview (Traffic)

| Arm | Linked arm | Use O-D data | Average Demand (Veh/hr) | Scaling Factor (%) |
|---|---|---|---|---|
| 1 - Port Road East | | ✓ | 362 | 100.000 |
| 2 - Pontrypridd Road | | ✓ | 710 | 100.000 |
| 3 - Port Road West | | ✓ | 808 | 100.000 |
| 4 - Waycock Road (Five Mile Lane) | | ✓ | 901 | 100.000 |

## Origin-Destination Data

### Demand (Veh/hr)

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 45 | 258 | 59 |
| | 2 - Pontrypridd Road | 86 | 0 | 244 | 380 |
| | 3 - Port Road West | 201 | 258 | 0 | 349 |
| | 4 - Waycock Road (Five Mile Lane) | 140 | 351 | 410 | 0 |

## Vehicle Mix

### Heavy Vehicle Percentages

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 2 | 5 | 2 |
| | 2 - Pontrypridd Road | 1 | 0 | 2 | 2 |
| | 3 - Port Road West | 4 | 1 | 0 | 1 |
| | 4 - Waycock Road (Five Mile Lane) | 1 | 2 | 0 | 0 |

# Results

## Results Summary for whole modelled period

| Arm | Max RFC | Max Delay (s) | Max Queue (Veh) | Max LOS |
|---|---|---|---|---|
| 1 - Port Road East | 0.38 | 5.64 | 0.6 | A |
| 2 - Pontrypridd Road | 0.55 | 5.72 | 1.2 | A |
| 3 - Port Road West | 0.72 | 10.22 | 2.5 | B |
| 4 - Waycock Road (Five Mile Lane) | 0.56 | 4.70 | 1.3 | A |

## Main Results for each time segment

### 16:30 - 16:45

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 273 | 764 | 1243 | 0.219 | 271 | 0.3 | 3.704 | A |
| 2 - Pontrypridd Road | 535 | 545 | 1575 | 0.339 | 532 | 0.5 | 3.447 | A |
| 3 - Port Road West | 608 | 394 | 1343 | 0.453 | 605 | 0.8 | 4.855 | A |
| 4 - Waycock Road (Five Mile Lane) | 678 | 408 | 1894 | 0.358 | 676 | 0.6 | 2.950 | A |

### 16:45 - 17:00

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 325 | 915 | 1156 | 0.282 | 325 | 0.4 | 4.331 | A |
| 2 - Pontrypridd Road | 638 | 653 | 1506 | 0.424 | 637 | 0.7 | 4.140 | A |
| 3 - Port Road West | 726 | 471 | 1300 | 0.559 | 725 | 1.2 | 6.235 | A |
| 4 - Waycock Road (Five Mile Lane) | 810 | 489 | 1837 | 0.441 | 809 | 0.8 | 3.500 | A |

### 17:00 - 17:15

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 399 | 1119 | 1038 | 0.384 | 398 | 0.6 | 5.611 | A |
| 2 - Pontrypridd Road | 782 | 799 | 1412 | 0.554 | 780 | 1.2 | 5.678 | A |
| 3 - Port Road West | 890 | 577 | 1242 | 0.716 | 885 | 2.4 | 9.953 | A |
| 4 - Waycock Road (Five Mile Lane) | 992 | 597 | 1759 | 0.564 | 990 | 1.3 | 4.668 | A |

### 17:15 - 17:30

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 399 | 1122 | 1036 | 0.385 | 399 | 0.6 | 5.642 | A |
| 2 - Pontrypridd Road | 782 | 800 | 1411 | 0.554 | 782 | 1.2 | 5.724 | A |
| 3 - Port Road West | 890 | 578 | 1241 | 0.717 | 889 | 2.5 | 10.224 | B |
| 4 - Waycock Road (Five Mile Lane) | 992 | 600 | 1757 | 0.565 | 992 | 1.3 | 4.704 | A |

### 17:30 - 17:45

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 325 | 919 | 1153 | 0.282 | 326 | 0.4 | 4.357 | A |
| 2 - Pontrypridd Road | 638 | 655 | 1504 | 0.424 | 640 | 0.7 | 4.175 | A |
| 3 - Port Road West | 726 | 473 | 1299 | 0.559 | 731 | 1.3 | 6.390 | A |
| 4 - Waycock Road (Five Mile Lane) | 810 | 493 | 1834 | 0.442 | 812 | 0.8 | 3.529 | A |

### 17:45 - 18:00

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 273 | 769 | 1240 | 0.220 | 273 | 0.3 | 3.723 | A |
| 2 - Pontrypridd Road | 535 | 548 | 1574 | 0.340 | 535 | 0.5 | 3.469 | A |
| 3 - Port Road West | 608 | 396 | 1342 | 0.453 | 610 | 0.8 | 4.931 | A |
| 4 - Waycock Road (Five Mile Lane) | 678 | 411 | 1892 | 0.359 | 679 | 0.6 | 2.970 | A |

# 2026 Base (commute trips 20% reduction + Dev (152,716m²), PM

### Data Errors and Warnings

| Severity | Area | Item | Description |
|---|---|---|---|
| Warning | Geometry | 1 - Port Road East - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |
| Warning | Geometry | 4 - Waycock Road (Five Mile Lane) - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |

## Junction Network

### Junctions

| Junction | Name | Junction type | Use circulating lanes | Arm order | Junction Delay (s) | Junction LOS |
|---|---|---|---|---|---|---|
| 1 | Waycock Cross Roundabout | Standard Roundabout | | 1, 2, 3, 4 | 28.73 | D |

### Junction Network Options

| Driving side | Lighting |
|---|---|
| Left | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) |
|---|---|---|---|---|---|---|
| D4 | 2026 Base (commute trips 20% reduction + Dev (152,716m²) | PM | ONE HOUR | 16:30 | 18:00 | 15 |

| Vehicle mix source | PCU Factor for a HV (PCU) |
|---|---|
| HV Percentages | 2.00 |

### Demand overview (Traffic)

| Arm | Linked arm | Use O-D data | Average Demand (Veh/hr) | Scaling Factor (%) |
|---|---|---|---|---|
| 1 - Port Road East | | ✓ | 404 | 100.000 |
| 2 - Pontrypridd Road | | ✓ | 641 | 100.000 |
| 3 - Port Road West | | ✓ | 1170 | 100.000 |
| 4 - Waycock Road (Five Mile Lane) | | ✓ | 850 | 100.000 |

## Origin-Destination Data

### Demand (Veh/hr)

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 53 | 302 | 49 |
| | 2 - Pontrypridd Road | 90 | 0 | 251 | 300 |
| | 3 - Port Road West | 388 | 304 | 0 | 478 |
| | 4 - Waycock Road (Five Mile Lane) | 105 | 325 | 420 | 0 |

## Vehicle Mix

### Heavy Vehicle Percentages

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 2 | 4 | 2 |
| | 2 - Pontrypridd Road | 2 | 0 | 1 | 2 |
| | 3 - Port Road West | 4 | 1 | 0 | 0 |
| | 4 - Waycock Road (Five Mile Lane) | 1 | 2 | 0 | 0 |

# Results

## Results Summary for whole modelled period

| Arm | Max RFC | Max Delay (s) | Max Queue (Veh) | Max LOS |
|---|---|---|---|---|
| 1 - Port Road East | 0.43 | 6.17 | 0.8 | A |
| 2 - Pontrypridd Road | 0.51 | 5.30 | 1.0 | A |
| 3 - Port Road West | 0.99 | 66.19 | 23.4 | F |
| 4 - Waycock Road (Five Mile Lane) | 0.59 | 5.59 | 1.4 | A |

## Main Results for each time segment

### 16:30 - 16:45

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 304 | 786 | 1238 | 0.246 | 303 | 0.3 | 3.844 | A |
| 2 - Pontrypridd Road | 483 | 578 | 1559 | 0.310 | 481 | 0.4 | 3.332 | A |
| 3 - Port Road West | 881 | 329 | 1381 | 0.638 | 874 | 1.7 | 7.009 | A |
| 4 - Waycock Road (Five Mile Lane) | 640 | 584 | 1767 | 0.362 | 638 | 0.6 | 3.180 | A |

### 16:45 - 17:00

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 363 | 940 | 1148 | 0.316 | 363 | 0.5 | 4.579 | A |
| 2 - Pontrypridd Road | 576 | 692 | 1486 | 0.388 | 576 | 0.6 | 3.952 | A |
| 3 - Port Road West | 1052 | 394 | 1345 | 0.782 | 1045 | 3.4 | 11.752 | B |
| 4 - Waycock Road (Five Mile Lane) | 764 | 699 | 1685 | 0.454 | 763 | 0.8 | 3.902 | A |

### 17:00 - 17:15

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 445 | 1139 | 1033 | 0.430 | 444 | 0.7 | 6.092 | A |
| 2 - Pontrypridd Road | 706 | 847 | 1386 | 0.509 | 704 | 1.0 | 5.271 | A |
| 3 - Port Road West | 1288 | 482 | 1296 | 0.994 | 1234 | 16.9 | 40.469 | E |
| 4 - Waycock Road (Five Mile Lane) | 936 | 829 | 1591 | 0.588 | 934 | 1.4 | 5.452 | A |

### 17:15 - 17:30

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 445 | 1148 | 1028 | 0.433 | 445 | 0.8 | 6.173 | A |
| 2 - Pontrypridd Road | 706 | 849 | 1384 | 0.510 | 706 | 1.0 | 5.305 | A |
| 3 - Port Road West | 1288 | 483 | 1295 | 0.995 | 1262 | 23.4 | 66.185 | F |
| 4 - Waycock Road (Five Mile Lane) | 936 | 846 | 1579 | 0.593 | 936 | 1.4 | 5.592 | A |

**17:30 - 17:45**

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 363 | 965 | 1134 | 0.320 | 364 | 0.5 | 4.686 | A |
| 2 - Pontrypridd Road | 576 | 695 | 1484 | 0.388 | 578 | 0.6 | 3.981 | A |
| 3 - Port Road West | 1052 | 396 | 1344 | 0.783 | 1130 | 3.9 | 22.132 | C |
| 4 - Waycock Road (Five Mile Lane) | 764 | 750 | 1648 | 0.464 | 766 | 0.9 | 4.092 | A |

**17:45 - 18:00**

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 304 | 793 | 1234 | 0.247 | 305 | 0.3 | 3.877 | A |
| 2 - Pontrypridd Road | 483 | 582 | 1557 | 0.310 | 483 | 0.5 | 3.357 | A |
| 3 - Port Road West | 881 | 331 | 1380 | 0.638 | 889 | 1.8 | 7.455 | A |
| 4 - Waycock Road (Five Mile Lane) | 640 | 594 | 1760 | 0.364 | 641 | 0.6 | 3.219 | A |

# Junctions 9

## ARCADY 9 - Roundabout Module

Version: 9.5.1.7462


**Filename:** Waycock Cross 2026 Commute Base 20% reduction plus Dev (189,725m²).j9
**Path:** P:\JNY9624 - Model Farm, Nr Cardiff\Transport\Arcady
**Report generation date:** 10/03/2021 14:59:17

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»2026 Base (commute trips 20% reduction), AM
»2026 Base (commute trips 20% reduction) + Dev (189,725m²), AM
»2026 Base (commute trips 20% reduction), PM
»2026 Base (commute trips 20% reduction) + Dev (189,725m²), PM

### Summary of junction performance

| | AM | | | PM | | |
|---|---|---|---|---|---|---|
| | Queue (Veh) | Delay (s) | RFC | Queue (Veh) | Delay (s) | RFC |
| | 2026 Base (commute trips 20% reduction) | | | | | |
| 1 - Port Road East | 0.6 | 5.67 | 0.39 | 0.6 | 5.64 | 0.38 |
| 2 - Pontrypridd Road | 1.3 | 5.74 | 0.57 | 1.2 | 5.72 | 0.55 |
| 3 - Port Road West | 4.2 | 16.24 | 0.81 | 2.5 | 10.22 | 0.72 |
| 4 - Waycock Road (Five Mile Lane) | 0.9 | 4.09 | 0.47 | 1.3 | 4.70 | 0.56 |
| | 2026 Base (commute trips 20% reduction) + Dev (189,725m²) | | | | | |
| 1 - Port Road East | 2.3 | 13.21 | 0.71 | 0.8 | 6.33 | 0.45 |
| 2 - Pontrypridd Road | 3.4 | 14.84 | 0.78 | 1.1 | 5.42 | 0.52 |
| 3 - Port Road West | 8.0 | 28.23 | 0.90 | 60.5 | 141.62 | 1.07 |
| 4 - Waycock Road (Five Mile Lane) | 1.6 | 5.63 | 0.62 | 1.5 | 5.75 | 0.60 |

*There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.*

*Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.*

### File summary

#### File Description

| | |
|---|---|
| Title | |
| Location | |
| Site number | |
| Date | 03/06/2019 |
| Version | |
| Status | (new file) |
| Identifier | |
| Client | |
| Jobnumber | |
| Enumerator | EUR\Alex.Snartt |
| Description | |

## Units

| Distance units | Speed units | Traffic units input | Traffic units results | Flow units | Average delay units | Total delay units | Rate of delay units |
|---|---|---|---|---|---|---|---|
| m | kph | Veh | Veh | perHour | s | -Min | perMin |

## Analysis Options

| Calculate Queue Percentiles | Calculate residual capacity | RFC Threshold | Average Delay threshold (s) | Queue threshold (PCU) |
|---|---|---|---|---|
| | | 0.85 | 36.00 | 20.00 |

## Demand Set Summary

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) |
|---|---|---|---|---|---|---|
| D1 | 2026 Base (commute trips 20% reduction) | AM | ONE HOUR | 07:45 | 09:15 | 15 |
| D2 | 2026 Base (commute trips 20% reduction) + Dev (189,725m²) | AM | ONE HOUR | 07:45 | 09:15 | 15 |
| D3 | 2026 Base (commute trips 20% reduction) | PM | ONE HOUR | 16:30 | 18:00 | 15 |
| D4 | 2026 Base (commute trips 20% reduction) + Dev (189,725m²) | PM | ONE HOUR | 16:30 | 18:00 | 15 |

## Analysis Set Details

| ID | Network flow scaling factor (%) |
|---|---|
| A1 | 100.000 |

# 2026 Base (commute trips 20% reduction), AM

### Data Errors and Warnings

| Severity | Area | Item | Description |
|---|---|---|---|
| Warning | Geometry | 1 - Port Road East - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |
| Warning | Geometry | 4 - Waycock Road (Five Mile Lane) - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |

## Junction Network

### Junctions

| Junction | Name | Junction type | Use circulating lanes | Arm order | Junction Delay (s) | Junction LOS |
|---|---|---|---|---|---|---|
| 1 | Waycock Cross Roundabout | Standard Roundabout | | 1, 2, 3, 4 | 8.64 | A |

### Junction Network Options

| Driving side | Lighting |
|---|---|
| Left | Normal/unknown |

## Arms

### Arms

| Arm | Name | Description |
|---|---|---|
| 1 | Port Road East | |
| 2 | Pontrypridd Road | |
| 3 | Port Road West | |
| 4 | Waycock Road (Five Mile Lane) | |

### Roundabout Geometry

| Arm | V - Approach road half-width (m) | E - Entry width (m) | l' - Effective flare length (m) | R - Entry radius (m) | D - Inscribed circle diameter (m) | PHI - Conflict (entry) angle (deg) | Exit only |
|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 4.50 | 6.50 | 37.5 | 15.0 | 51.0 | 45.0 | |
| 2 - Pontrypridd Road | 6.25 | 7.00 | 3.0 | 20.0 | 51.0 | 38.0 | |
| 3 - Port Road West | 3.50 | 8.50 | 14.0 | 10.0 | 51.0 | 45.0 | |
| 4 - Waycock Road (Five Mile Lane) | 4.00 | 8.00 | 53.0 | 13.0 | 50.0 | 20.0 | |

### Slope / Intercept / Capacity

#### Roundabout Slope and Intercept used in model

| Arm | Final slope | Final intercept (PCU/hr) |
|---|---|---|
| 1 - Port Road East | 0.594 | 1753 |
| 2 - Pontrypridd Road | 0.646 | 1964 |
| 3 - Port Road West | 0.554 | 1589 |
| 4 - Waycock Road (Five Mile Lane) | 0.707 | 2207 |

*The slope and intercept shown above include any corrections and adjustments.*

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) |
|---|---|---|---|---|---|---|
| D1 | 2026 Base (commute trips 20% reduction) | AM | ONE HOUR | 07:45 | 09:15 | 15 |

| Vehicle mix source | PCU Factor for a HV (PCU) |
|---|---|
| HV Percentages | 2.00 |

### Demand overview (Traffic)

| Arm | Linked arm | Use O-D data | Average Demand (Veh/hr) | Scaling Factor (%) |
|---|---|---|---|---|
| 1 - Port Road East | | ✓ | 366 | 100.000 |
| 2 - Pontypridd Road | | ✓ | 751 | 100.000 |
| 3 - Port Road West | | ✓ | 875 | 100.000 |
| 4 - Waycock Road (Five Mile Lane) | | ✓ | 700 | 100.000 |

## Origin-Destination Data

### Demand (Veh/hr)

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 44 | 227 | 95 |
| | 2 - Pontypridd Road | 66 | 0 | 253 | 432 |
| | 3 - Port Road West | 239 | 287 | 0 | 349 |
| | 4 - Waycock Road (Five Mile Lane) | 81 | 343 | 276 | 0 |

## Vehicle Mix

### Heavy Vehicle Percentages

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 2 | 14 | 2 |
| | 2 - Pontypridd Road | 1 | 0 | 2 | 6 |
| | 3 - Port Road West | 6 | 2 | 0 | 0 |
| | 4 - Waycock Road (Five Mile Lane) | 3 | 9 | 0 | 0 |

## Results

### Results Summary for whole modelled period

| Arm | Max RFC | Max Delay (s) | Max Queue (Veh) | Max LOS |
|---|---|---|---|---|
| 1 - Port Road East | 0.39 | 5.67 | 0.6 | A |
| 2 - Pontypridd Road | 0.57 | 5.74 | 1.3 | A |
| 3 - Port Road West | 0.81 | 16.24 | 4.2 | C |
| 4 - Waycock Road (Five Mile Lane) | 0.47 | 4.09 | 0.9 | A |

### Main Results for each time segment

#### 07:45 - 08:00

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 276 | 679 | 1217 | 0.226 | 274 | 0.3 | 3.812 | A |
| 2 - Pontypridd Road | 565 | 449 | 1591 | 0.355 | 563 | 0.5 | 3.495 | A |
| 3 - Port Road West | 659 | 445 | 1301 | 0.506 | 655 | 1.0 | 5.538 | A |
| 4 - Waycock Road (Five Mile Lane) | 527 | 443 | 1797 | 0.293 | 525 | 0.4 | 2.827 | A |

### 08:00 - 08:15

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 329 | 813 | 1142 | 0.288 | 329 | 0.4 | 4.425 | A |
| 2 - Pontrypridd Road | 675 | 537 | 1533 | 0.440 | 674 | 0.8 | 4.187 | A |
| 3 - Port Road West | 787 | 532 | 1251 | 0.629 | 784 | 1.7 | 7.666 | A |
| 4 - Waycock Road (Five Mile Lane) | 629 | 531 | 1736 | 0.363 | 629 | 0.6 | 3.250 | A |

### 08:15 - 08:30

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 403 | 993 | 1040 | 0.387 | 402 | 0.6 | 5.635 | A |
| 2 - Pontrypridd Road | 827 | 657 | 1454 | 0.569 | 825 | 1.3 | 5.700 | A |
| 3 - Port Road West | 963 | 651 | 1183 | 0.814 | 954 | 4.0 | 15.096 | C |
| 4 - Waycock Road (Five Mile Lane) | 771 | 646 | 1655 | 0.466 | 770 | 0.9 | 4.060 | A |

### 08:30 - 08:45

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 403 | 997 | 1038 | 0.388 | 403 | 0.6 | 5.670 | A |
| 2 - Pontrypridd Road | 827 | 658 | 1454 | 0.569 | 827 | 1.3 | 5.743 | A |
| 3 - Port Road West | 963 | 653 | 1183 | 0.815 | 963 | 4.2 | 16.242 | C |
| 4 - Waycock Road (Five Mile Lane) | 771 | 651 | 1651 | 0.467 | 771 | 0.9 | 4.087 | A |

### 08:45 - 09:00

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 329 | 819 | 1139 | 0.289 | 330 | 0.4 | 4.457 | A |
| 2 - Pontrypridd Road | 675 | 539 | 1532 | 0.441 | 677 | 0.8 | 4.222 | A |
| 3 - Port Road West | 787 | 535 | 1250 | 0.629 | 796 | 1.7 | 8.107 | A |
| 4 - Waycock Road (Five Mile Lane) | 629 | 538 | 1730 | 0.364 | 630 | 0.6 | 3.278 | A |

### 09:00 - 09:15

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 276 | 684 | 1215 | 0.227 | 276 | 0.3 | 3.837 | A |
| 2 - Pontrypridd Road | 565 | 451 | 1589 | 0.356 | 566 | 0.6 | 3.521 | A |
| 3 - Port Road West | 659 | 447 | 1299 | 0.507 | 662 | 1.0 | 5.669 | A |
| 4 - Waycock Road (Five Mile Lane) | 527 | 447 | 1794 | 0.294 | 528 | 0.4 | 2.846 | A |

# 2026 Base (commute trips 20% reduction) + Dev (189,725m²), AM

### Data Errors and Warnings

| Severity | Area | Item | Description |
|---|---|---|---|
| Warning | Geometry | 1 - Port Road East - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |
| Warning | Geometry | 4 - Waycock Road (Five Mile Lane) - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |

## Junction Network

### Junctions

| Junction | Name | Junction type | Use circulating lanes | Arm order | Junction Delay (s) | Junction LOS |
|---|---|---|---|---|---|---|
| 1 | Waycock Cross Roundabout | Standard Roundabout | | 1, 2, 3, 4 | 15.98 | C |

### Junction Network Options

| Driving side | Lighting |
|---|---|
| Left | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) |
|---|---|---|---|---|---|---|
| D2 | 2026 Base (commute trips 20% reduction) + Dev (189,725m²) | AM | ONE HOUR | 07:45 | 09:15 | 15 |

| Vehicle mix source | PCU Factor for a HV (PCU) |
|---|---|
| HV Percentages | 2.00 |

### Demand overview (Traffic)

| Arm | Linked arm | Use O-D data | Average Demand (Veh/hr) | Scaling Factor (%) |
|---|---|---|---|---|
| 1 - Port Road East | | ✓ | 592 | 100.000 |
| 2 - Pontrypridd Road | | ✓ | 775 | 100.000 |
| 3 - Port Road West | | ✓ | 991 | 100.000 |
| 4 - Waycock Road (Five Mile Lane) | | ✓ | 928 | 100.000 |

## Origin-Destination Data

### Demand (Veh/hr)

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 43 | 463 | 86 |
| | 2 - Pontrypridd Road | 46 | 0 | 333 | 396 |
| | 3 - Port Road West | 263 | 293 | 0 | 435 |
| | 4 - Waycock Road (Five Mile Lane) | 63 | 295 | 570 | 0 |

## Vehicle Mix

### Heavy Vehicle Percentages

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 7 | 6 | 2 |
| | 2 - Pontrypridd Road | 2 | 0 | 4 | 6 |
| | 3 - Port Road West | 11 | 2 | 0 | 0 |
| | 4 - Waycock Road (Five Mile Lane) | 3 | 9 | 0 | 0 |

# Results

## Results Summary for whole modelled period

| Arm | Max RFC | Max Delay (s) | Max Queue (Veh) | Max LOS |
|---|---|---|---|---|
| 1 - Port Road East | 0.71 | 13.21 | 2.3 | B |
| 2 - Pontrypridd Road | 0.78 | 14.84 | 3.4 | B |
| 3 - Port Road West | 0.90 | 28.23 | 8.0 | D |
| 4 - Waycock Road (Five Mile Lane) | 0.62 | 5.63 | 1.6 | A |

## Main Results for each time segment

### 07:45 - 08:00

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 446 | 868 | 1159 | 0.385 | 443 | 0.6 | 5.016 | A |
| 2 - Pontrypridd Road | 583 | 839 | 1342 | 0.435 | 580 | 0.8 | 4.706 | A |
| 3 - Port Road West | 746 | 395 | 1313 | 0.568 | 741 | 1.3 | 6.240 | A |
| 4 - Waycock Road (Five Mile Lane) | 699 | 450 | 1814 | 0.385 | 696 | 0.6 | 3.214 | A |

### 08:00 - 08:15

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 532 | 1039 | 1060 | 0.502 | 531 | 1.0 | 6.788 | A |
| 2 - Pontrypridd Road | 697 | 1004 | 1238 | 0.563 | 695 | 1.3 | 6.601 | A |
| 3 - Port Road West | 891 | 473 | 1269 | 0.702 | 887 | 2.3 | 9.326 | A |
| 4 - Waycock Road (Five Mile Lane) | 834 | 539 | 1749 | 0.477 | 833 | 0.9 | 3.924 | A |

### 08:15 - 08:30

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 652 | 1267 | 927 | 0.703 | 647 | 2.3 | 12.600 | B |
| 2 - Pontrypridd Road | 853 | 1226 | 1098 | 0.777 | 845 | 3.3 | 13.841 | B |
| 3 - Port Road West | 1091 | 576 | 1211 | 0.901 | 1071 | 7.2 | 23.083 | C |
| 4 - Waycock Road (Five Mile Lane) | 1022 | 651 | 1668 | 0.613 | 1019 | 1.6 | 5.528 | A |

### 08:30 - 08:45

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 652 | 1274 | 923 | 0.706 | 651 | 2.3 | 13.206 | B |
| 2 - Pontrypridd Road | 853 | 1232 | 1094 | 0.780 | 853 | 3.4 | 14.840 | B |
| 3 - Port Road West | 1091 | 581 | 1208 | 0.903 | 1088 | 8.0 | 28.227 | D |
| 4 - Waycock Road (Five Mile Lane) | 1022 | 661 | 1661 | 0.615 | 1022 | 1.6 | 5.630 | A |

**08:45 - 09:00**

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 532 | 1050 | 1053 | 0.505 | 537 | 1.0 | 7.051 | A |
| 2 - Pontrypridd Road | 697 | 1012 | 1232 | 0.565 | 705 | 1.3 | 6.932 | A |
| 3 - Port Road West | 891 | 480 | 1265 | 0.704 | 913 | 2.5 | 10.832 | B |
| 4 - Waycock Road (Five Mile Lane) | 834 | 554 | 1738 | 0.480 | 837 | 0.9 | 4.006 | A |

**09:00 - 09:15**

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 446 | 874 | 1155 | 0.386 | 447 | 0.6 | 5.100 | A |
| 2 - Pontrypridd Road | 583 | 845 | 1338 | 0.436 | 586 | 0.8 | 4.795 | A |
| 3 - Port Road West | 746 | 399 | 1311 | 0.569 | 751 | 1.3 | 6.478 | A |
| 4 - Waycock Road (Five Mile Lane) | 699 | 456 | 1810 | 0.386 | 700 | 0.6 | 3.246 | A |

# 2026 Base (commute trips 20% reduction), PM

### Data Errors and Warnings

| Severity | Area | Item | Description |
|---|---|---|---|
| Warning | Geometry | 1 - Port Road East - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |
| Warning | Geometry | 4 - Waycock Road (Five Mile Lane) - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |

## Junction Network

### Junctions

| Junction | Name | Junction type | Use circulating lanes | Arm order | Junction Delay (s) | Junction LOS |
|---|---|---|---|---|---|---|
| 1 | Waycock Cross Roundabout | Standard Roundabout | | 1, 2, 3, 4 | 6.69 | A |

### Junction Network Options

| Driving side | Lighting |
|---|---|
| Left | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) |
|---|---|---|---|---|---|---|
| D3 | 2026 Base (commute trips 20% reduction) | PM | ONE HOUR | 16:30 | 18:00 | 15 |

| Vehicle mix source | PCU Factor for a HV (PCU) |
|---|---|
| HV Percentages | 2.00 |

### Demand overview (Traffic)

| Arm | Linked arm | Use O-D data | Average Demand (Veh/hr) | Scaling Factor (%) |
|---|---|---|---|---|
| 1 - Port Road East | | ✓ | 362 | 100.000 |
| 2 - Pontrypridd Road | | ✓ | 710 | 100.000 |
| 3 - Port Road West | | ✓ | 808 | 100.000 |
| 4 - Waycock Road (Five Mile Lane) | | ✓ | 901 | 100.000 |

## Origin-Destination Data

### Demand (Veh/hr)

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 45 | 258 | 59 |
| | 2 - Pontrypridd Road | 86 | 0 | 244 | 380 |
| | 3 - Port Road West | 201 | 258 | 0 | 349 |
| | 4 - Waycock Road (Five Mile Lane) | 140 | 351 | 410 | 0 |

## Vehicle Mix

### Heavy Vehicle Percentages

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 2 | 5 | 2 |
| | 2 - Pontrypridd Road | 1 | 0 | 2 | 2 |
| | 3 - Port Road West | 4 | 1 | 0 | 1 |
| | 4 - Waycock Road (Five Mile Lane) | 1 | 2 | 0 | 0 |

# Results

## Results Summary for whole modelled period

| Arm | Max RFC | Max Delay (s) | Max Queue (Veh) | Max LOS |
|---|---|---|---|---|
| 1 - Port Road East | 0.38 | 5.64 | 0.6 | A |
| 2 - Pontrypridd Road | 0.55 | 5.72 | 1.2 | A |
| 3 - Port Road West | 0.72 | 10.22 | 2.5 | B |
| 4 - Waycock Road (Five Mile Lane) | 0.56 | 4.70 | 1.3 | A |

## Main Results for each time segment

### 16:30 - 16:45

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 273 | 764 | 1243 | 0.219 | 271 | 0.3 | 3.704 | A |
| 2 - Pontrypridd Road | 535 | 545 | 1575 | 0.339 | 532 | 0.5 | 3.447 | A |
| 3 - Port Road West | 608 | 394 | 1343 | 0.453 | 605 | 0.8 | 4.855 | A |
| 4 - Waycock Road (Five Mile Lane) | 678 | 408 | 1894 | 0.358 | 676 | 0.6 | 2.950 | A |

### 16:45 - 17:00

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 325 | 915 | 1156 | 0.282 | 325 | 0.4 | 4.331 | A |
| 2 - Pontrypridd Road | 638 | 653 | 1506 | 0.424 | 637 | 0.7 | 4.140 | A |
| 3 - Port Road West | 726 | 471 | 1300 | 0.559 | 725 | 1.2 | 6.235 | A |
| 4 - Waycock Road (Five Mile Lane) | 810 | 489 | 1837 | 0.441 | 809 | 0.8 | 3.500 | A |

### 17:00 - 17:15

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 399 | 1119 | 1038 | 0.384 | 398 | 0.6 | 5.611 | A |
| 2 - Pontrypridd Road | 782 | 799 | 1412 | 0.554 | 780 | 1.2 | 5.678 | A |
| 3 - Port Road West | 890 | 577 | 1242 | 0.716 | 885 | 2.4 | 9.953 | A |
| 4 - Waycock Road (Five Mile Lane) | 992 | 597 | 1759 | 0.564 | 990 | 1.3 | 4.668 | A |

### 17:15 - 17:30

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 399 | 1122 | 1036 | 0.385 | 399 | 0.6 | 5.642 | A |
| 2 - Pontrypridd Road | 782 | 800 | 1411 | 0.554 | 782 | 1.2 | 5.724 | A |
| 3 - Port Road West | 890 | 578 | 1241 | 0.717 | 889 | 2.5 | 10.224 | B |
| 4 - Waycock Road (Five Mile Lane) | 992 | 600 | 1757 | 0.565 | 992 | 1.3 | 4.704 | A |

### 17:30 - 17:45

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 325 | 919 | 1153 | 0.282 | 326 | 0.4 | 4.357 | A |
| 2 - Pontrypridd Road | 638 | 655 | 1504 | 0.424 | 640 | 0.7 | 4.175 | A |
| 3 - Port Road West | 726 | 473 | 1299 | 0.559 | 731 | 1.3 | 6.390 | A |
| 4 - Waycock Road (Five Mile Lane) | 810 | 493 | 1834 | 0.442 | 812 | 0.8 | 3.529 | A |

### 17:45 - 18:00

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 273 | 769 | 1240 | 0.220 | 273 | 0.3 | 3.723 | A |
| 2 - Pontrypridd Road | 535 | 548 | 1574 | 0.340 | 535 | 0.5 | 3.469 | A |
| 3 - Port Road West | 608 | 396 | 1342 | 0.453 | 610 | 0.8 | 4.931 | A |
| 4 - Waycock Road (Five Mile Lane) | 678 | 411 | 1892 | 0.359 | 679 | 0.6 | 2.970 | A |

# 2026 Base (commute trips 20% reduction) + Dev (189,725m²), PM

### Data Errors and Warnings

| Severity | Area | Item | Description |
|---|---|---|---|
| Warning | Geometry | 1 - Port Road East - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |
| Warning | Geometry | 4 - Waycock Road (Five Mile Lane) - Roundabout Geometry | Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution. |

## Junction Network

### Junctions

| Junction | Name | Junction type | Use circulating lanes | Arm order | Junction Delay (s) | Junction LOS |
|---|---|---|---|---|---|---|
| 1 | Waycock Cross Roundabout | Standard Roundabout | | 1, 2, 3, 4 | 59.73 | F |

### Junction Network Options

| Driving side | Lighting |
|---|---|
| Left | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) |
|---|---|---|---|---|---|---|
| D4 | 2026 Base (commute trips 20% reduction) + Dev (189,725m²) | PM | ONE HOUR | 16:30 | 18:00 | 15 |

| Vehicle mix source | PCU Factor for a HV (PCU) |
|---|---|
| HV Percentages | 2.00 |

### Demand overview (Traffic)

| Arm | Linked arm | Use O-D data | Average Demand (Veh/hr) | Scaling Factor (%) |
|---|---|---|---|---|
| 1 - Port Road East | | ✓ | 418 | 100.000 |
| 2 - Pontrypridd Road | | ✓ | 644 | 100.000 |
| 3 - Port Road West | | ✓ | 1267 | 100.000 |
| 4 - Waycock Road (Five Mile Lane) | | ✓ | 853 | 100.000 |

## Origin-Destination Data

### Demand (Veh/hr)

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 55 | 314 | 49 |
| | 2 - Pontrypridd Road | 91 | 0 | 253 | 300 |
| | 3 - Port Road West | 438 | 316 | 0 | 513 |
| | 4 - Waycock Road (Five Mile Lane) | 105 | 325 | 423 | 0 |

## Vehicle Mix

### Heavy Vehicle Percentages

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 - Port Road East | 2 - Pontrypridd Road | 3 - Port Road West | 4 - Waycock Road (Five Mile Lane) |
| From | 1 - Port Road East | 0 | 2 | 4 | 2 |
| | 2 - Pontrypridd Road | 2 | 0 | 1 | 2 |
| | 3 - Port Road West | 3 | 1 | 0 | 0 |
| | 4 - Waycock Road (Five Mile Lane) | 1 | 2 | 0 | 0 |

# Results

## Results Summary for whole modelled period

| Arm | Max RFC | Max Delay (s) | Max Queue (Veh) | Max LOS |
|---|---|---|---|---|
| 1 - Port Road East | 0.45 | 6.33 | 0.8 | A |
| 2 - Pontrypridd Road | 0.52 | 5.42 | 1.1 | A |
| 3 - Port Road West | 1.07 | 141.62 | 60.5 | F |
| 4 - Waycock Road (Five Mile Lane) | 0.60 | 5.75 | 1.5 | A |

## Main Results for each time segment

### 16:30 - 16:45

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 315 | 797 | 1231 | 0.256 | 313 | 0.3 | 3.915 | A |
| 2 - Pontrypridd Road | 485 | 589 | 1552 | 0.312 | 483 | 0.5 | 3.362 | A |
| 3 - Port Road West | 954 | 330 | 1385 | 0.689 | 945 | 2.2 | 8.045 | A |
| 4 - Waycock Road (Five Mile Lane) | 642 | 631 | 1736 | 0.370 | 640 | 0.6 | 3.278 | A |

### 16:45 - 17:00

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 376 | 953 | 1141 | 0.329 | 375 | 0.5 | 4.698 | A |
| 2 - Pontrypridd Road | 579 | 706 | 1477 | 0.392 | 578 | 0.6 | 4.003 | A |
| 3 - Port Road West | 1139 | 395 | 1348 | 0.845 | 1128 | 4.9 | 15.597 | C |
| 4 - Waycock Road (Five Mile Lane) | 767 | 753 | 1648 | 0.465 | 766 | 0.9 | 4.074 | A |

### 17:00 - 17:15

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 460 | 1139 | 1033 | 0.446 | 459 | 0.8 | 6.260 | A |
| 2 - Pontrypridd Road | 709 | 863 | 1375 | 0.516 | 707 | 1.1 | 5.381 | A |
| 3 - Port Road West | 1395 | 483 | 1299 | 1.074 | 1274 | 35.1 | 67.973 | F |
| 4 - Waycock Road (Five Mile Lane) | 939 | 858 | 1573 | 0.597 | 937 | 1.5 | 5.637 | A |

### 17:15 - 17:30

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 460 | 1146 | 1029 | 0.447 | 460 | 0.8 | 6.327 | A |
| 2 - Pontrypridd Road | 709 | 865 | 1373 | 0.516 | 709 | 1.1 | 5.417 | A |
| 3 - Port Road West | 1395 | 484 | 1298 | 1.074 | 1293 | 60.5 | 141.625 | F |
| 4 - Waycock Road (Five Mile Lane) | 939 | 870 | 1565 | 0.600 | 939 | 1.5 | 5.751 | A |

### 17:30 - 17:45

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 376 | 1005 | 1111 | 0.338 | 377 | 0.5 | 4.914 | A |
| 2 - Pontrypridd Road | 579 | 709 | 1475 | 0.393 | 581 | 0.7 | 4.034 | A |
| 3 - Port Road West | 1139 | 397 | 1347 | 0.845 | 1325 | 13.9 | 106.114 | F |
| 4 - Waycock Road (Five Mile Lane) | 767 | 871 | 1564 | 0.490 | 769 | 1.0 | 4.539 | A |

### 17:45 - 18:00

| Arm | Total Demand (Veh/hr) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | RFC | Throughput (Veh/hr) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|---|
| 1 - Port Road East | 315 | 814 | 1222 | 0.258 | 315 | 0.3 | 3.975 | A |
| 2 - Pontrypridd Road | 485 | 593 | 1549 | 0.313 | 486 | 0.5 | 3.385 | A |
| 3 - Port Road West | 954 | 332 | 1384 | 0.689 | 1000 | 2.3 | 10.503 | B |
| 4 - Waycock Road (Five Mile Lane) | 642 | 664 | 1712 | 0.375 | 644 | 0.6 | 3.373 | A |