



# **South Wales Metro**

Task Order 028-I - Taffs Well Depot Outline  
Planning - Transport Assessment

March 2018

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# Executive summary

This Transport Assessment has been prepared by Mott MacDonald on behalf of Transport for Wales (TfW) in support of the outline planning application for the proposed South Wales Metro rolling stock depot in Taffs Well.

The new depot is being developed as a component of Phase 2 of the South Wales Metro Scheme. This will involve the construction of a maintenance workshop and operations facility, including multiple stabling lines and rolling stock washing facilities etc. to be located on the Forgemasters site adjacent to Ffordd Bleddyn, Taffs Well.

The development is classed as 'enabling' infrastructure, as it is part of the investment required to transform the Core Valley Lines (CVL). Additional depot and stabling facilities are required to accommodate the new fleet of rolling stock, allowing the new Wales and Borders Service provider to run a higher frequency and more reliable service on the CVL.

The new facility will cover an area of 3.6 hectares. The Site is bounded to the north and east by the A470, south-west by the Merthyr railway line, and to the north-west by an industrial estate.

Taffs Well Depot proposals have been developed within the context of existing planning policies, which must be considered for the development to be aligned with the aspirations and objectives of the relevant planning bodies.

## Development proposals

The proposed development site is comprised of a brown field site. The surface is predominantly covered in hardstanding, forming roads, car parks and building floor slabs, for the multiple industrial and commercial buildings that are currently on site.

The Site is approximately 9.0km north-west of Cardiff City Centre. The main access to the Site is from the west via Ffordd Bleddyn and the A4054 (Cardiff Road).

## Proposed Site Access Arrangements

Road access into the depot site is proposed on the western edge of the site via the existing mini roundabout on Ffordd Bleddyn.

A secondary access will be constructed from a decked car park off the re-aligned Ffordd Bleddyn. This access will cater for both depot staff parking and the additional rail station Park and Ride (P&R) facility.

Pedestrian and cycle access will be through the main site access along a segregated footway / cycleway into the site. A new pedestrian route and crossing will be created between the site entrance and new rail station P&R site, connecting with local designated cycle routes.

## Proposed Highway Improvements

To facilitate the development works, improvements to the local highway will be required, these include:

- Upgrading Ffordd Bleddyn mini roundabout to add a forth arm, providing direct access into the development site.

- To gain rail track access into the depot site it is proposed to modify Ffordd Bleddyn. The road will be vertically re-aligned, to pass over three rail tracks connecting the proposed depot and existing main railway line. The re-alignment will follow the level of Cardiff Road / Ffordd Bleddyn junction, starting to fall to ground level after passing the last of the three depot tracks, with a maximum gradient of 1:20. It will reach the ground level close to the existing mini roundabout junction. The elevated road section will be placed either on a viaduct structure, or an embankment with underpasses for the new tracks.
- All existing junctions along Ffordd Bleddyn will be closed, from the signals with the A4054 to the mini roundabout.
- A new P&R vehicle entrance will be constructed at the Northern end of the P&R site off Moy Rd Link.
- A new pedestrian crossing will be provided from the decked public car park to Taffs Well station.

## Sustainable Transport

Sustainable transport and active travel was considered in line with the requirements of the Active Travel (Wales) Act (2013) and the Local Development Plan (2008 – 2021).

The availability of bus and rail services in the locality has been identified and included in the development strategy. There are significant benefits in terms of sustainable transport arising from the proposed development. It would provide increased and more attractive public transport which would encourage private motor vehicle trip reduction throughout the area.

The report includes an indicative Travel Plan which will be updated prior to site occupation.

## Trip Generation

The traffic flows were assessed for three years: 2017 (Base); 2021 (Opening); and 2031 (Design) in the AM and PM peaks. Base traffic data was obtained through a traffic survey programme on the local highway network in 2017. Traffic signal data was supplied by Rhondda Cynon Taf County Borough Council (RCTCBC) for the Cardiff Rd/ Ffordd Bleddyn signalised junction assessment.

Future year growth was determined by applying TEMPro Interim v7.2 growth factors for RCTCBC area dataset for urban principal roads.

The resulting background traffic growth shows a forecast increase of 5% between 2017 and 2021 and 13% between 2017 and 2031.

Development trips have been generated for the staff and deliveries associated with the proposed depot and applied to the base and future year traffic flows.

Staff trip calculations were based on information provided by TfW.

## Junction Modelling

Four junctions were assessed using industry standard software:

- Ffordd Bleddyn mini roundabout assessed in ARCADY. The results show that Ffordd Bleddyn mini roundabout with the proposed improvements operates within capacity in all existing and development scenarios.
- Ffordd Bleddyn / P&R entrance assessed in PICADY.

The results show that Ffordd Bleddyn / P&R entrance with the proposed improvements operates within capacity in all existing and development scenarios,

- Moy Road / Ffordd Bleddyn assessed in PICADY.

The results show that the Moy Road/ Ffordd Bleddyn junction operates within capacity in all existing and development scenarios.

- Cardiff Rd / Ffordd Bleddyn signalised junction assessed in LinSig.

Overall the assessment results indicate that the junction operates within desirable capacity on all arms in the 2017 base scenario. By 2031 Cardiff Road East is operating within theoretical capacity with the development and Cardiff Rd West is within theoretical capacity for Base and Base + Development scenarios in both the AM and PM Peak periods, with a DoS of 99.1% and 90.5% respectively. The results indicate that the junction will be approaching capacity by 2031 with or without the development of Taffs Well Depot.

## Car Parking

This section sets out the results of the calculations undertaken for car parking provision, with due regard to RCTCBC parking policy for both office and maintenance staff. The total of 140 spaces include 5% disabled parking and 5% two-wheeled provision. A minimum of 20 bicycle stands will be provided in line with current planning guidance.

## Construction

The construction phase impact on transport has been assessed with the aim to minimise disruption to road and rail users.

The programme estimates it will take just over two and a half years to construct the depot from receipt of detailed planning permission in March 2019 to opening the depot in December 2021.

This report section outlines the construction phasing which confirms disruption to transport is minimal and not of concern.

## Conclusion

This Transport Assessment shows the site is ideally situated to provide a modern metro rolling stock stabling and maintenance facility with good vehicular access via the road network, bicycle access from the cycle paths and sustainable transport infrastructure with its proximity to a rail line and good links to the bus network.

It is concluded that there are no highway and transport reasons that the development should not proceed.

# 1 Introduction

## 1.1 Overview

Mott MacDonald has been commissioned by Transport for Wales (TfW) to provide planning and technical support during the current procurement phase for the next 'Wales and Borders Rail Service' which will include the development of the South Wales Metro Phase 2, focusing specifically on the Core Valley Lines (CVL). This programme of works, funded by the Welsh and UK Governments and the European Commission, will transform the rail network involving extensive investment in new rolling stock, stations and associated infrastructure. It will deliver a step change in the public transport offer bringing about improved connectivity between the CVL and Cardiff and providing a much needed modern, reliable and efficient public transport system.

As part of the investment required to transform the rail network, additional depot and stabling facilities are required to accommodate the new fleet of rolling stock. As such, Welsh Government undertook a comprehensive site search process to find suitable and available land. This has resulted in Welsh Government acquiring the former 'Forgemasters' building and associated land at Garth Works Industrial Estate in Taffs Well. The whole site area, including the associated works to Taffs Well Station, extends to some 5.4 hectares and is shown on drawing number 367590-28I-XX-DR-C-0005.

In order to ensure early delivery of investment for the CVL and minimise risk to the preferred bidder (who will be named the Operator and Development Partner (ODP) once the procurement process is concluded) Welsh Government and TfW are seeking to secure outline planning permission for the depot and associated works.

In order to accommodate the specific operational requirements of the preferred ODP, the planning permission needs to have flexibility and as such, a 'Hybrid' Planning Application for the depot and associated works is being sought from Rhondda Cynon Taf County Borough Council (RCTCBC) as the Local Planning Authority. The hybrid planning application will seek full planning permission for the demolition of the existing buildings within the industrial estate and outline planning permission for construction of the depot and associated works. This approach provides flexibility for TfW in allowing demolition and site clearance works to commence in advance of works for the main depot and then the detailed design of the depot and associated works being dealt with through a Reserved Matters Planning Application. It is anticipated however, that the outline element of the planning permission for the depot and associated works will be subject to maximum parameters in terms of built floorspace, car parking and general alignment of highway infrastructure. These parameters and principles will then need to be reflected in the preferred ODP's detailed design solution through any Reserved Matters application.

## 1.2 Project Description

An indicative masterplan (Drawings 367590-28I-XX-DR-C-0002 and 0003) of the Taffs Well Depot has been prepared which indicates the construction of the following:

- A new rolling stock depot comprising of:
  - Multiple stabling lines.
  - A maintenance workshop with offices above.
  - A rolling stock washing facility.

- A sand replenishment plant.
- A delivery track where rolling stock will be delivered on HGVs and lifted onto the depot tracks.
- A substation.
- Staff parking and increased P&R spaces.
- Associated works will include:
  - Local highways and rail infrastructure improvements.
  - A new footbridge over Taffs Well Station.
  - Extension to the existing Taffs Well Station western platform.
  - Improvements to the Taff Trail cycle and pedestrian path.

### 1.3 Scope of this Report

This Transport Assessment has been prepared by Mott MacDonald on behalf of TfW in support of the Outline Planning Application for the new proposed South Wales Metro rolling stock depot at Taffs Well.

The document sets out the methodology and the results of work undertaken to assess the likely traffic impact of the development proposals on the local highway network.

The Transport Assessment covers the following;

Section 2 – provides the policy context.

Section 3 – sets out the development proposals, conditions and constraints in context of the development site locations.

Section 4 – gives an overview of the public transport connectivity and the proposed active travel (walking and cycling) measures.

Section 5 – provides the outline travel plan.

Section 6 – provides information on the proposed highway realignment.

Section 7 – summarises the data collection and data analysis.

Section 8 – presents the base year traffic flows.

Section 9 – presents the forecast future years' base traffic flows.

Section 10 – provides information on the development trip generation methodology and calculation of trip forecasts for the proposed development, including all assumptions made.

Section 11 – provides the junction capacity analysis.

Section 12 – deals with development parking requirements.

Section 13 – deals with construction traffic.

Section 14 – provides the collision analysis.

Section 15 – conclusions.



## 1.4 Consultation

The analysis has been undertaken in accordance with current policy requirements of the Welsh Government and RCTCBC and agreed in the Transport Assessment scoping stage on:

- Welsh Government on the 12<sup>th</sup> July 2017
- RCTCBC on the 18<sup>th</sup> August 2017

## 2 Policy Context

Taffs Well Depot will be developed within the context of the existing planning policy, which must be considered so that the development can be aligned with the aspirations and objectives of the relevant planning bodies. This section sets out the relevant transport planning policy at national, regional and local levels.

### 2.1 National Transport Policy

#### 2.1.1 Wales Transport Strategy (One Wales: Connecting the Nation, April 2008)

The overarching ambition for transport in Wales is set out in the Wales Transport Strategy. This ambition includes reducing the greenhouse gas and environmental impact of transport whilst at the same time improving accessibility and safety. To achieve these ambitions, the expectation is to improve access by public transport, cycling and walking.

The South Wales Metro Depot will act as a key employer in South East Wales and will address the aspirations to reduce greenhouse gas emissions and improve public transport integration by providing clear pedestrian and cycle connections between the site and local bus stops and rail stations. By improving these connections, the development has the potential to encourage a mode shift towards active modes and public transport.

#### 2.1.2 Active Travel (Wales) Act (November 2013)

The Active Travel (Wales) Act makes it a legal requirement for local authorities in Wales to plan for, improve, and promote suitable walking and cycling routes within designated built-up areas. By connecting key sites such as workplaces, hospitals, schools and shopping areas with active travel routes, the intention of the Act is to encourage people to rely less on their cars when making short journeys.

The Taffs Well Depot site is located within a well-developed area of Rhondda Cynon Taf (and is therefore within the remit of the Act) and will encourage use of active modes through integration with the surrounding network of pedestrian rights of way and cycling infrastructure, including the Taff Trail and Cardiff Strategic Cycle Network. This will help to fulfil the Act's aspiration to provide access to work places and reduce reliance on private car for short journeys.

#### 2.1.3 Planning Policy Wales Edition 9 November 2016

Planning Policy Wales (most recently updated in November 2016) sets out the land use planning policies for Wales. Chapter 8 deals with Transport. The Welsh Government aims to extend choices in transport and secure accessibility in a way that supports sustainable development, and helps to tackle climate change by encouraging a more effective and efficient use of transport systems. The document is supplemented by a series of Technical Advice Notes (TANs).

#### 2.1.4 Technical Advice Note (TAN) 18 March 2007

TAN 18 describes how to integrate land use and transport planning, and explains how the transport impacts of development should be assessed and mitigated. TAN 18 sets out the thresholds at which planning applications should be accompanied by a Transport Assessment. The land class Industry, with a gross floor area exceeding 5,000 sqm, requires a Transport Assessment.

TAN 18 also contains advice on parking standards, designing for inclusive mobility, promoting alternatives to the car, integrating development with policies for walking and cycling, and improving public transport provision. Each of these categories is being considered as part of the Taffs Well Depot development.

- Parking requirements have been carefully examined to ensure that adequate parking is provided for employees, yet is at an appropriate level in accordance with the underlying advice in TAN 18;
- Alternatives to the private car are being promoted through the design of inclusive pedestrian environments and connections to surrounding walking and cycling networks; and
- The development will be integrated with the local public transport (bus and rail) networks.

## 2.2 Local Planning Policy

### 2.2.1 Rhondda Cynon Taf Local Development Plan 2008 - 2021 (Adopted 2011)

The Rhondda Cynon Taf (RCT) LDP identifies the key transport issues relevant to RCT and the high level of intervention needed to address the issues. It also details the delivery priorities for the plan period and the longer-term aspirations.

The LDP seeks to promote the development of a business environment that delivers a strong and diverse economy, quality well paid jobs and address problems of economic activity. Concerns regarding the redundant industrial space are highlighted. The LDP recognises the role of existing employment sites in meeting employment needs and fully supports the redevelopment and modernisation of existing brown field sites to meet changing employment needs. The role of RCT in the Capital region and the provision of appropriate land for employment, housing and transport development is integral to its success.

The desired LDP outcomes which are relevant to the South Wales Metro Depot included the provision of quality employment on an existing brown field site, with good access to non-car travel opportunities between communities.

In southern RCT, the emphasis is on sustainable growth that benefits RCT as a whole. Specific objectives include reducing daily out commuting by private car, promoting sustainable transport and enhancing transport infrastructure services to support growth and investment. Taffs Well Station is identified as a location for P&R provision.

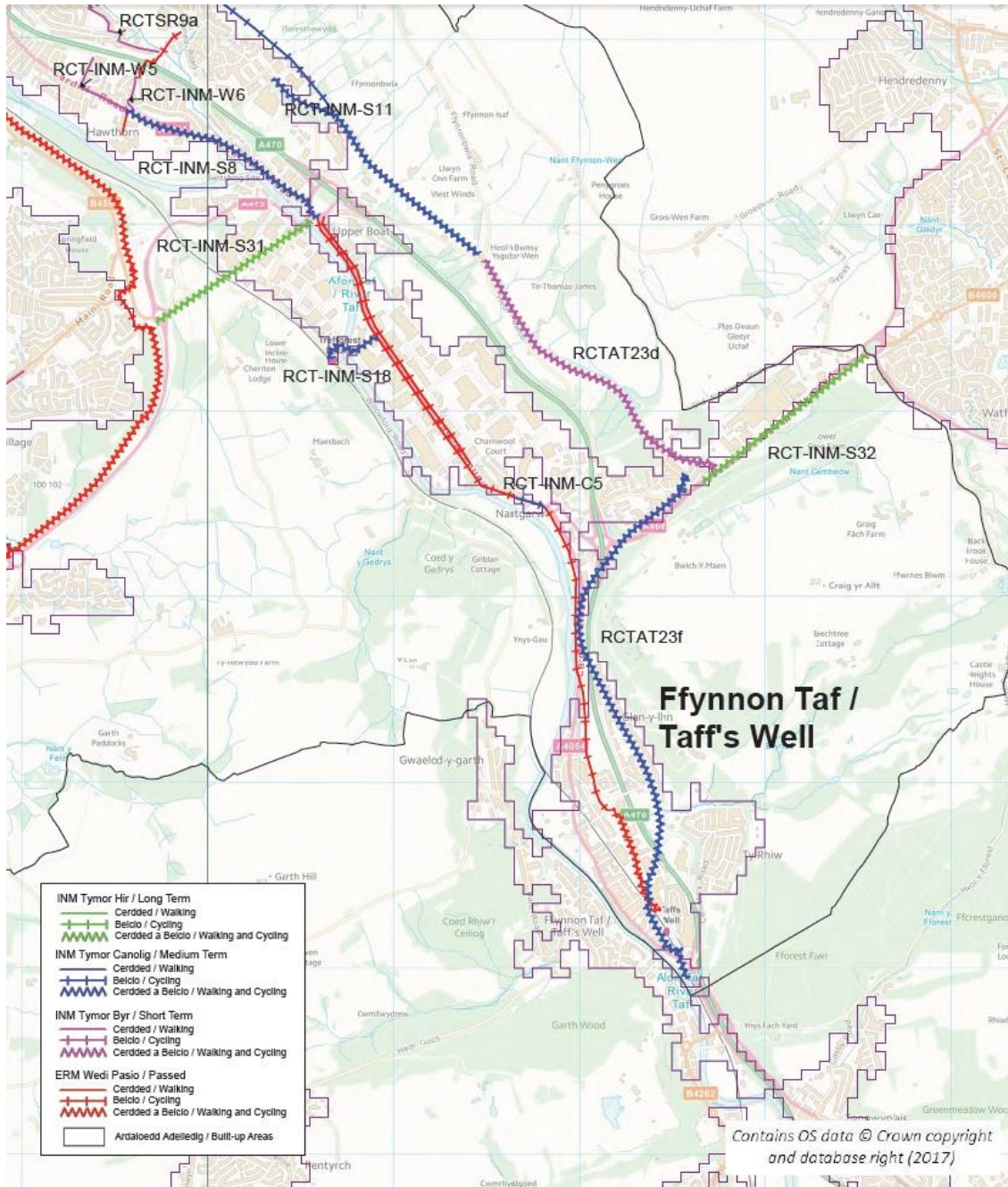
The design of the South Wales Metro Depot meets the LDP expectations for new development in terms of accessibility by sustainable transport, reduction of car dependence, impact on the highway network and parking.

### 2.2.2 Active Travel (Wales) Act 2013

RCTCBC has taken a proactive approach to supporting cycling as 'a realistic alternative to many short distance journeys that are currently made by car' by working in partnership with organisations such as Sustrans to provide the necessary infrastructure to encourage more journeys by bike.

The council has produced a draft Integrated Network Map to detail proposed active travel routes to be delivered over the next 15 years. Figure 1 displays the section of this map that covers Taffs Well and the proposed development site.

Figure 1: Active Travel Routes



Source: Rhondda Cynon Taf County Council

The most recent Active Travel Annual Report (2016-2017) details the specific actions taken to promote active travel journeys, secure new active travel routes and facilities, and the costs incurred from improvements carried out in the preceding financial year. This document covers both site-specific developments and authority-wide policies and initiatives such as delivery of National Standards cycle training to 993 school pupils, the support of 25 active Junior Road Safety Officer (JRSO) schemes and the development of walking and cycling trails to encourage

active travel throughout Rhondda Cynon Taf. This report also details specific actions taken to secure active travel infrastructure associated with the planned development such as the proposed re-opening of the Abernant rail tunnel and the re-organisation of schools in the Porth area.

### **2.3 South Wales Metro Study 2015**

RCTCBC is in the process of commissioning a study to explore the development of a rapid transit corridor to link communities in South East Rhondda Cynon Taf with the centre of Cardiff. This study will 'examine the operation and technical feasibility of reinstating a passenger rail service along the disused line between Pontyclun and Beddau, as well as the construction of a light rail (tram) route using an alternative alignment through North West Cardiff'.

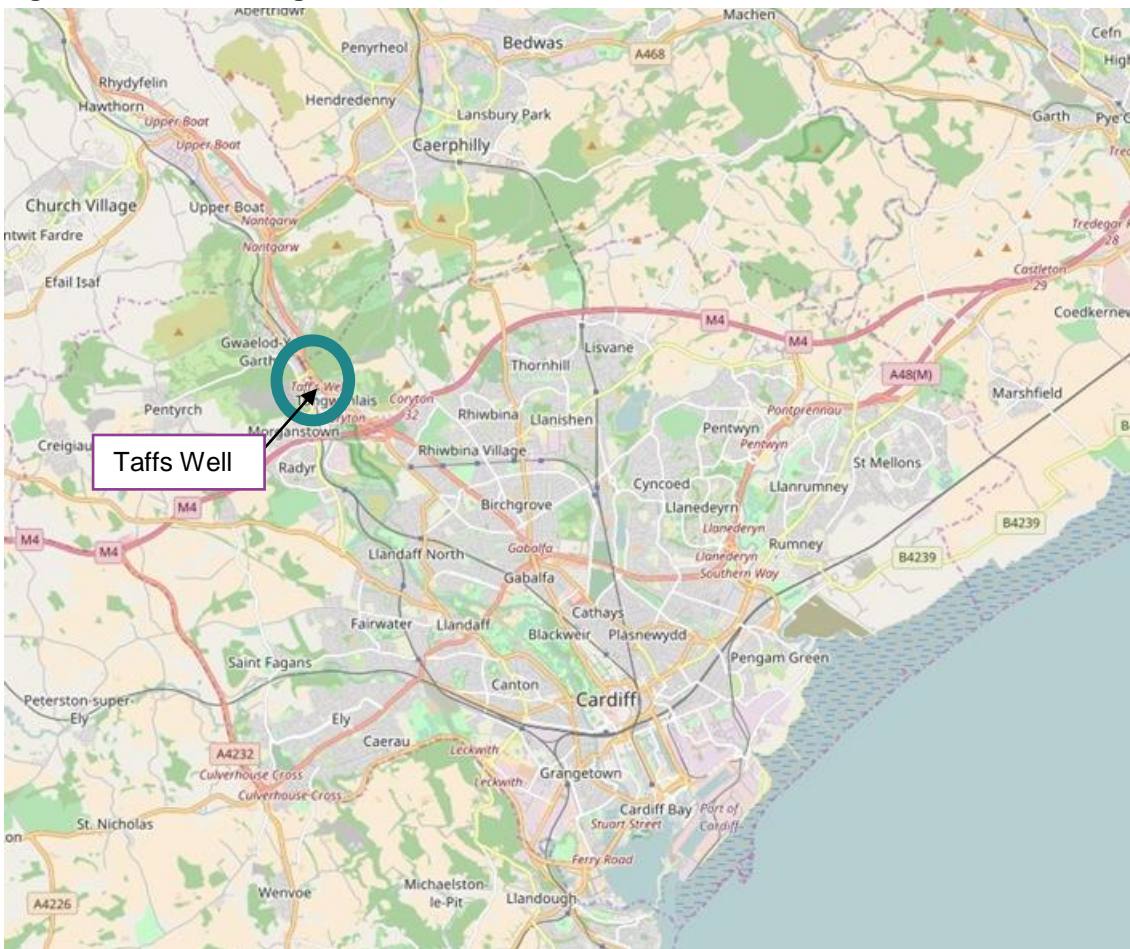


## 3 Development Proposals

### 3.1 Site location

The Site is located in Taffs Well approximately 9.0km north-west of Cardiff City Centre. The National Grid Reference to the centre of the Site is ST 12550 83270. The main access to the Site is from Ffordd Bleddyn, west of the site, via the A4054 (Cardiff Road). The Site is bounded to the north and east by the A470, south and south-west by the Rhondda and Merthyr railway line, and to the north-west by an industrial estate. The regional location of Taffs Well is shown in Figure 2.

Figure 2: Taffs Well Regional Location



Source: @OpenStreetMap contributors

The approximate Metro Depot Site boundary within Taffs Well is shown in Figure 3

**Figure 3: Approximate Planning Site Boundary**



Source: <http://nationalarchives.gov.uk/doc/open-government-licence/version2>

### 3.2 Site Description

The Site is oval in shape with its longest length in a north to south trend and occupies an area of approximately 5.4ha, this includes all land within the red line boundary (Drawing number 367590-28I-XX-DR-C-0004) and associated works at and around Taffs Well Station.

The depot site covers an area of 3.6ha. The surface is predominantly covered in hardstanding, former roads, car parks and building floor slabs, for the multiple industrial and commercial buildings that previously occupied the site. The remaining 1.8ha are made up of the section of Ffordd Bleddyn adjacent to the site, the current station P&R site and Taffs Well rail station.

### 3.3 Development Proposals

The full development description for the project is as follows:

Hybrid Planning Application for the construction of the Taffs Well Depot on land at the Garth Works Industrial Estate in Taffs Well.

- Part A: Full planning application for the demolition and site clearance works associated with existing buildings and structures on the Garth Works Industrial Estate.
- Part B: Outline planning application with all matters reserved for the construction of the Taffs Well Depot including: multiple stabling lines; a maintenance workshop with offices above; a rolling stock washing facility; a sand replenishment plant; a delivery track; a substation; staff

parking and increased P&R spaces; highways and rail infrastructure improvements; modifications to Taffs Well Station and landscaping.

### 3.4 Main Site Access Arrangements

Road access into the depot site is proposed from the existing mini roundabout on Ffordd Bleddyn. To facilitate the development the roundabout will be upgraded to accommodate an additional arm providing direct access into the site.

To gain rail track access into the depot site it is proposed to modify Ffordd Bleddyn. The road will be vertically re-aligned, to pass over three rail tracks connecting the proposed depot and main railway line. It will follow the level of Cardiff Road junction, starting to fall to ground level after passing the last of the three depot tracks, with a gradient of 5% approx. It will reach the ground level close to the existing roundabout junction. The elevated road section will be placed either on a viaduct structure, or an embankment with underpasses for the new tracks. The indicative masterplan for the proposals are provided in Appendix B.

### 3.5 Secondary Access

A secondary access will be constructed from a decked car park off the re-aligned Ffordd Bleddyn. This access will cater for both depot staff parking and the relocated rail station P&R facility.

### 3.6 Pedestrian / Cycle Access

Pedestrian and cycle access will be through the main site access, designed with a segregated footway / cycleway into the site. A new pedestrian route and crossing will be created between the site entrance and new rail station P&R site.



## 4 Sustainable Transport and Accessibility

### 4.1 Introduction

The site is located close to a wide range of existing and proposed transport networks providing staff and visitors with sustainable transport links to and from the area. Increased use of alternative modes and concessionary travel enjoyed by the depot staff will assist in reducing the impact of the development on the highway network.

The availability of bus and rail services in the locality has been identified and included in the development strategy. There are significant benefits in terms of sustainable transport arising from the proposed development. It would provide increased and more attractive public transport which would encourage private motor vehicle trip reduction throughout the area.

This section sets out the existing public transport provision (bus and rail), public transport proposals, and the existing and proposed provision for walking and cycling. Section 5 covers the Indicative Travel Plan.

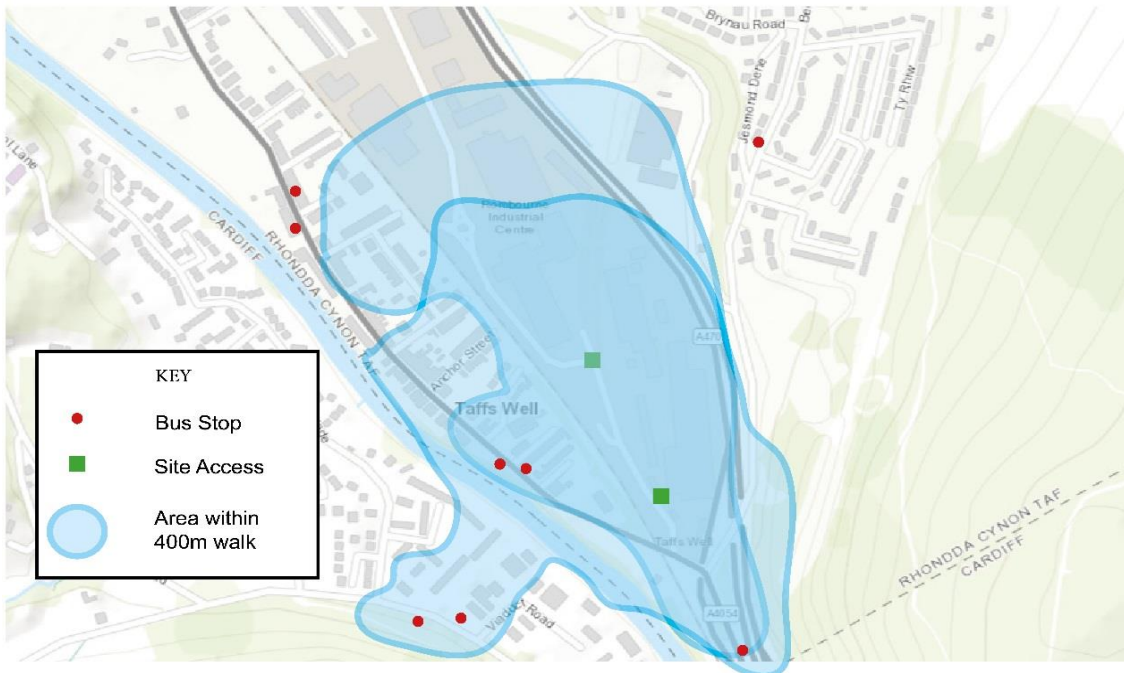
### 4.2 Public Transport

#### 4.2.1 Bus

Guidance from the Institutions of Highways and Transportation (Planning for Public Transport in Developments 1999) states a threshold of 400m as being generally considered to be the maximum distance acceptable to most people for walking to a bus stop. Furthermore, the document 'Inclusive Mobility' (A Guide to best practice on access to pedestrian and transport infrastructure DFT 2002) refers to research that indicates bus use by the elderly and the disabled reduces rapidly where distances to bus stops are more than 200m. Figure 4 illustrates the areas that fall within a 400m walking distance from the access points to the site and indicates that several bus stops are accessible within this distance. Stops concentrated around Cardiff Rd fall within this radius from the site's Western access point, the other stops at the junction of Cardiff Rd and Moy Rd to the north fall outside a 400m boundary.

As illustrated by Figure 4 there are five bus stops within 400 meters of one of the site entrances and three further stops in close proximity. These bus stops correspond with the bus service routes in Table 1 which provide good connections to the north and south of the site.

**Figure 4: Bus Stops near the Proposed Metro Site**



Source: Mott MacDonald

Bus service 26 and 132, operated by Stage Coach (South Wales) and G1 by New Adventure Travel (NAT). Table 1 sets out the service schedules, indicating that there are frequent services close to the site.

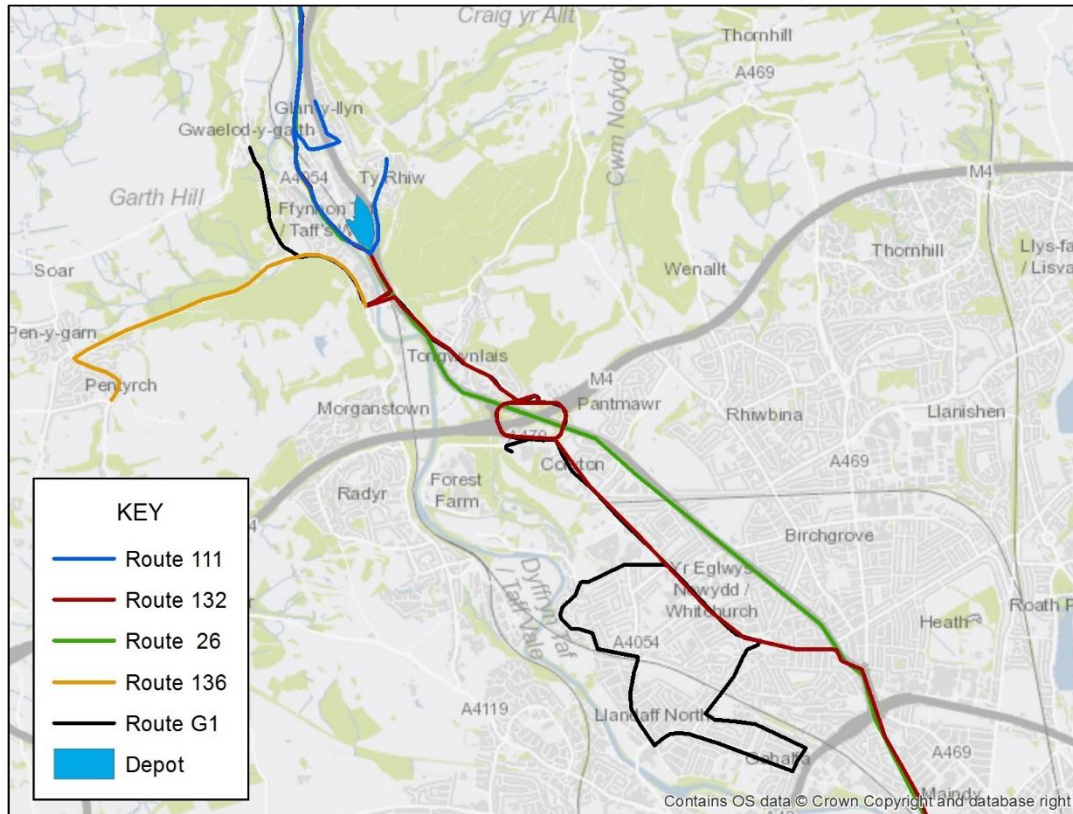
**Table 1: Bus Service Schedule**

Route	Route Detail	Operator	Mon – Fri Daytime Frequency	First and Last Services	Sat – Sun Daytime Frequency
26	Blackwood to Cardiff	Stagecoach South Wales	Every 30 Minutes	06:25, 21:35	Saturday every 30 minutes Sunday every 60 minutes
	Cardiff to Blackwood		Every 30 Minutes	07:55, 23:00	Saturday every 30 minutes Sunday every 60 minutes
132	Cardiff to Maerdy	Stagecoach South Wales	Every 12 Minutes	06:50, 23:35	Saturday every 15 minutes Sunday every 30 minutes
	Maerdy To Cardiff		Every 12 Minutes	05:10, 21:56	Saturday every 15 minutes Sunday every 30 minutes
136	Cardiff to Creigiau	Stagecoach South Wales	Every 60 Minutes	08:25, 21:50	Saturday every 60 minutes Sunday No Service
	Creigiau to Cardiff		Every 60 Minutes	07:49, 21:08	Saturday every 60 minutes Sunday No Service
G1	Cardiff to Gwaelod-y-Garth	New Adventure Travel	7 services per day	08:25, 17:08	Saturday
111	Taffs Well (Ty Rhiw) To Pontypridd		5 Services Per Day	09:00, 15:35	Saturday

Route	Route Detail	Operator	Mon – Fri Daytime Frequency	First and Last Services	Sat – Sun Daytime Frequency
111	Pontypridd to Taffs Well (Ty Rhiw)	New Adventure Travel	4 Services Per Day	09:25, 14:25	Saturday

Source: Published Time Table 2017

**Figure 5: Wider Area Bus Routes**



Source: Mott Macdonald

Stagecoach (South Wales) operates regular services from Blackwood along the Sirhowy and Rhymney Valley's, and from Maerdy in the Rhondda Valley to Cardiff with stops for both services on Cardiff Rd. Staff and visitors would be able to access the depot site from these bus stops via the pedestrian crossing at Taffs Well station.

The depot site is therefore well served by convenient bus stops, frequent bus services and good connections, although areas to the north and south are better served than those to the east and west of the site, which is to be expected due to the topography of the valleys which limits settlement and road construction on an east-west axis.

### 4.3 Rail

Taffs Well Railway Station is located adjacent to the depot and serves those travelling from the north from Merthyr Tydfil on the Merthyr Valley line and from Aberdare and Treherbert via Rhondda Valley lines, southward the valley lines connect to Penarth, Barry and national

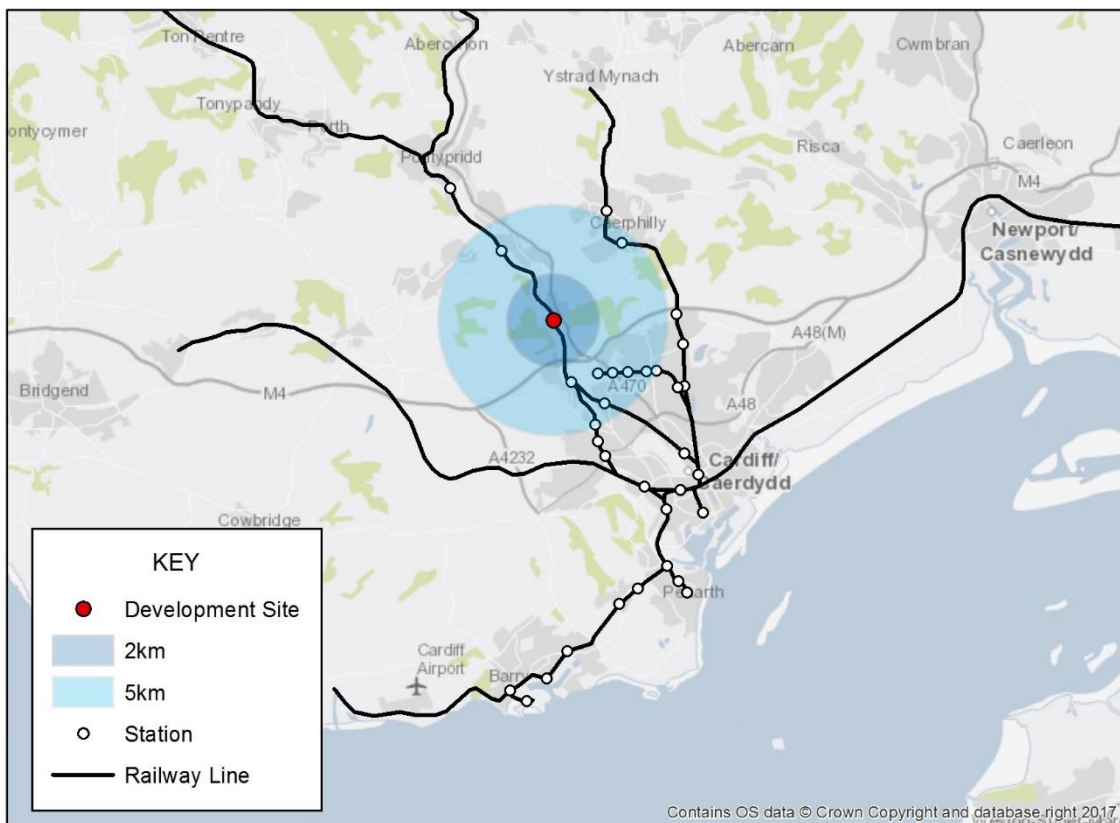
services from Cardiff Central Station. Table 2 sets out the service frequency and the times of the first and last services each day.

**Table 2: Rail Service Schedule**

Line	Direction	First and Last Services	Mon-Fri Frequency	Weekend Frequency
Merthyr Valley Line	Merthyr Tydfil to Cardiff	06:38, 22:38	Every 30 Minutes	Sunday 1 train per hour
	Cardiff to Merthyr Tydfil	05:26, 22:26	Every 30 Minutes	Sunday 1 train every 2 hours
Aberdare Line	Aberdare to Cardiff	06:22, 22:54	Every 30 Minutes	Sunday 1 Train every hour
	Cardiff to Aberdare	05:26, 22:41	Every 30 Minutes	Sunday 1 Train every 2 hours
Treherbert Line	Treherbert To Cardiff	05:47, 21:17	Every 30 Minutes	Sunday 1 Train every hour
	Cardiff to Treherbert	06:36, 22:46	Every 30 Minutes	Sunday 1 Train Every 2 hours

Source: National Rail Timetable

**Figure 6: Rail Network Close to the Proposed Depot Development Site**



Source: Mott MacDonald



## 4.4 Active Travel

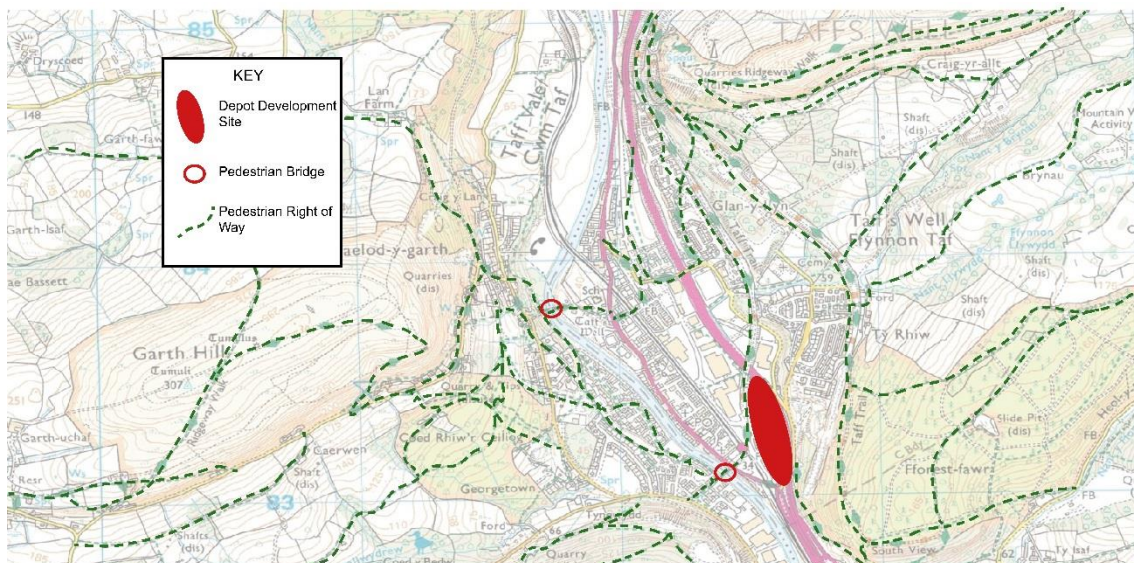
### 4.4.1 Walking

The depot site benefits from proximity to a high number of pedestrian rights of way. As illustrated in Figure 7 the site is within walking distance of the Taff Trail as well as pedestrian rights of way in Fforest-fawr, to the east. Garth Hill and Garth Wood to the west of the river Taff also have a high number of pedestrian paths which can be accessed from the depot site via two pedestrian bridges between Cardiff Road and Main Road.

The streets surrounding the depot site have pedestrian-friendly pavements and dropped kerbs to facilitate crossings. There is a pedestrian and cycle-only route and bridge crossing the A470, linking Cardiff Road to the south of the development site with Forest Road and the adjacent residential settlements north of the site, before linking into the Taff Trail. There is also wayfinding signage on Cardiff Road to the south of the site which aids pedestrian and cyclist navigation.

The site is located within 2 miles of a number of residential settlements which are accessible via pedestrian rights of way shown in Figure 7 and pavements which could encourage employees and visitors to walk to the depot. Local bus stops and rail stations are also easily accessible by pedestrians traveling to and from the depot site, which facilitates use of public transport as a viable means to reach the site for both employees and visitors.

**Figure 7: Pedestrian Rights of Way**



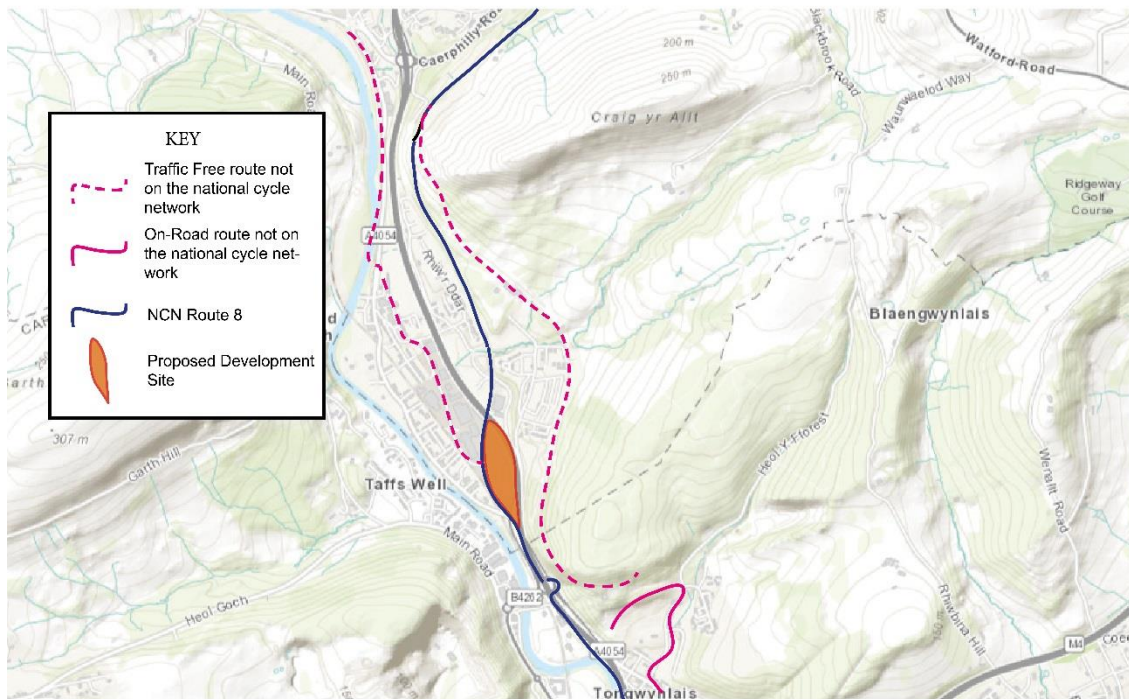
Source: Mott Macdonald

### 4.4.2 Cycling

The depot site benefits from close proximity to several key cycling routes which provide excellent active travel connections to Cardiff in the south and beyond Pontypridd in the north. These routes include the National Cycle Network route 8 and the Taff Trail which provide off-road, traffic-free, routes as well as other on-road routes identified by Sustrans. These routes

form a key element of RCTCBC'S commitment to supporting cycling infrastructure in partnership with Sustrans and are illustrated in Figure 8.

**Figure 8: National Cycle Network Routes**



Source: Mott MacDonald

The Taffs Well Depot site is well-suited to access by both staff and visitors by cycle due to this robust cycling infrastructure in close proximity to the site, which compliments the cycling-to-work initiatives undertaken by RCTCBC and the objectives of the Active Travel Wales (2015) Act.

Active travel routes in the vicinity of the proposed development site will need to be checked for compliance at the detailed design stage.

## 5 Travel Plan

This indicative Travel Plan has been produced in support of the planning process. A full Travel Plan will be prepared by the Operator and Development Partner (ODP) once appointed and approved via suitably worded planning conditions.

The Operator and Development Partner will encourage the use of sustainable modes by their staff. It will include an appointed Travel Plan Coordinator and be based on staff travel to work surveys.

The Travel Plan will be supported by senior staff, who along with the Travel Plan coordinator have responsibility for ensuring that resources are available to meet the plan's requirements.

The Operator and Development Partners are committed to making environmental improvements and to lessen the Depots impact on the environment. The Travel Plan fits in with the aspirations to promote sustainability, ease of access and healthy lifestyles for their staff.

A number of measures will be promoted to reduce their staff's reliance on private motor vehicles for both work related trips and their commute to and from work. These include:

- Providing information on accessible public transport modes for each of their locations;
- Free Travel on the operator's network;
- Encouraging staff to use public transport where possible for attendance at meetings etc;
- Secure bike sheds / racks and showers for those who choose to cycle;
- Access to cycle-to-work scheme;
- Encouraging car-sharing for staff commutes where public transport is not an option;
- Promoting running clubs;
- Promoting home working where possible. File sharing, phone and video facilities for ad-hoc and scheduled meetings;
- Events aimed at encouraging staff to walk and cycle will be held by the operator, such as;
  - A Travel Road Show
  - Bike maintenance sessions
  - Practical cycle riding skills session
  - Lunch time walks

The Travel Plan will contain established measures and targets, with a timetable of actions designed to measure the progress in achieving the set goals.

For the Travel Plan to succeed the operators recognise the need to engage with external organisations. As such, partnership working will be established with, Sustrans, Travel Line Cymru, Carshare2 Cardiff and the Welsh Government.

The operator will be committed to sharing the results of the annual review with Local Authorities and working with them to resolve any issues which may arise with the Travel Plan.

## 6 Highway Improvements

### 6.1 Main site access route

The development plans propose a main site access route from the north-western end of the site via the existing mini roundabout on Ffordd Bleddyn. To facilitate the development, it is proposed to upgrade the current 3 arm lay-out to include a fourth arm, providing direct access into the development site. All other existing site accesses between the roundabout and the signalised junction with Cardiff Road will be closed.

The new main access would provide for two-way vehicle movement which would interface with a strategically located pedestrian and cycle crossing providing continual access to the Taff Trail.

Ffordd Bleddyn and Moy Rd Link are both the responsibility of RCTCBC.

All drawings appertaining to the existing situation and proposed alignment are shown in Appendix B.

### 6.2 Existing Alignment

The existing Ffordd Bleddyn alignment runs from the signalised junction on A4054 (Cardiff Rd) to the mini roundabout joining Moy Rd link road. It is formed of a 7m single carriageway two-way road, widening to 12m at the stop line. On each side of the carriageway is a 2m hard strip pedestrian and cycle way. From the junction with Cardiff Road, it falls in 5-6 % longitudinal gradient to the ground level at Taffs Well station.

There are a number of access points into the existing Foragemaster site currently used as access by the small businesses that occupy the site and for vehicle access to the Taffs Well rail station P&R sites.

The existing Ffordd Bleddyn mini roundabout is standard arrangement, with a circulatory carriageway width of approximately 8m, an inscribed circle diameter of 18m, a traffic island of 2m and three arms serving access to industrial units to the north, Moy Rd link road to the west and Ffordd Bleddyn to the south. There is one entry and one exit lane to and from each arm.

There are two P&R sites accessed from Ffordd Bleddyn, with a total parking capacity of approximately 170 vehicles.

### 6.3 Proposed Alignment

Due to the proposed access tracks and depot layout, it is necessary to modify Ffordd Bleddyn. The road will be vertically re-aligned, to pass over two new overbridges to allow the new rail tracks to access the proposed depot from the main railway line. It will follow the level of Cardiff Road junction, starting to fall to ground level after passing the last of the three depot access tracks, with a maximum gradient of 1:20. It will reach the existing ground level close to the existing roundabout junction. The elevated road section will be placed either on a viaduct structure, or an embankment with underpasses for the new tracks.

To provide access to the development, the proposals include works to increase the number of arms on the mini roundabout to 4, providing access directly into the site.



Due to the proposed depot layout and vertical re-alignment of Ffordd Bleddyn, it is necessary to change the current parking facilities. The existing eastern car park will be closed and the land used for the proposed depot tracks and maintenance roads. The western car park, adjacent to Taffs Well station, will keep its parking capacity, but due to the vertical realignment of Ffordd Bleddyn, the access point will be moved to the northern corner of the car park. Further detail is provided on the drawings in Appendix B.

A new car park is proposed on the upper deck over the depot stabling tracks. Vehicle and pedestrian access to the car park is enabled from a new junction on the newly elevated section of Ffordd Bleddyn. The total capacity of the upper deck parking is 214 vehicles, of which 120 are proposed for the depot staff and visitors, and 94 for the public, compensating for the closed car park at ground level.

The existing footbridge over the main railway line at Taffs Well station will be removed and replaced with a new, extended one, enabling direct access from the upper deck car park to the station platforms via stairs and lifts. Up to 20 spaces on the main depot site at ground level will be designated for operational parking. These will be used by vehicles essential to the operation of the site and short-term delivery vehicles.

## 7 Traffic Data

### 7.1 Overview

To inform the transport assessment several traffic surveys were undertaken in the vicinity of the proposed Taffs Well Depot development site in June 2017.

All surveys were commissioned by Mott MacDonald and undertaken by Tracsis.

### 7.2 Survey Type

Three types of traffic data collection were undertaken including;

- Junction Turning Counts
- Automatic Traffic Count
- Traffic Signal Timings – Data Provided By RCTCC

#### 7.2.1 Junction Turning Counts

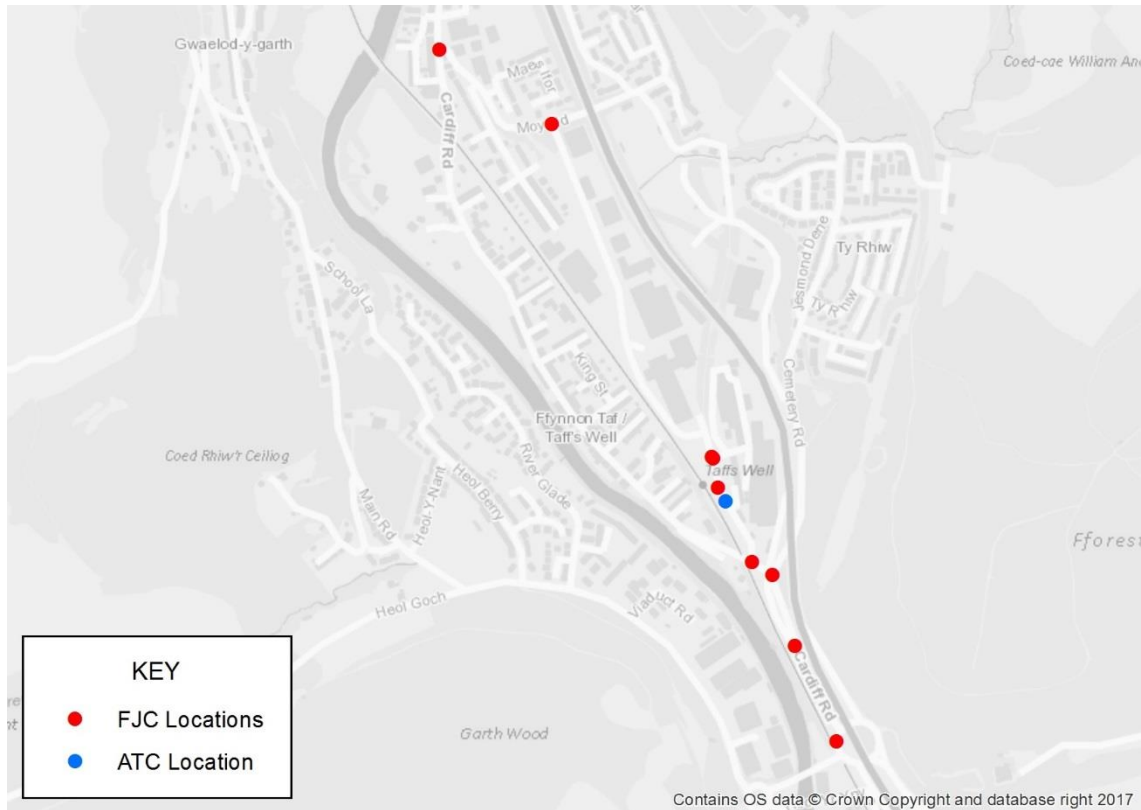
Junction Turning Counts were collected at eight sites on Wednesday the 21<sup>st</sup> June 2017 for a twelve-hour period between 07:00 and 19:00

The survey locations are listed in Table 3 and Figure 9 shows a plan of the survey sites.

**Table 3: Taffs Well Depot Traffic Surveys**

Ref No	Survey Type	Survey Location	Co-ordinate
69	Full Junction Count	Taffs Well Rail Station Car Park, both access points	51.540861, -3.263064
70	Full Junction Count	Moy Rd Link / Development site main access	51.541403, -3.263259
22	Full Junction Count	A470 / B4262/ A4054 Roundabout Taffs Well	51.536391, -3.259550
23	Full Junction Count	A470 North On-Slip from Cardiff Road, Taffs Well	51.538066, -3.260806
24	Full Junction Count	Cardiff Rd / Cemetery Rd Taffs Well	51.539326, -3.261480
25	Full Junction Count	A4054 / Cardiff Rd / Taffs Well station access Traffic signals	51.539546, -3.262070
26	Full Junction Count	Moy Rd Link/ Forgemaster site main entrance Taffs Well	51.541384, -3.263222
27	Full Junction Count	Moy Rd / Moy Rd Link T- Junction, North of Rhys Davies Logistics, Taffs Well	51.547279, -3.268003
28	Full Junction Count	Moy Road Cardiff Road T-junction, Taffs Well	51.548563, -3.271244

**Figure 9: Traffic Survey Locations**



Source: Mott Macdonald

### 7.2.2 Automatic Traffic Count (ATC)

Automatic traffic count collected data was collected on Ffordd Bleddyn for two weeks beginning Wednesday 21<sup>st</sup> June to Tuesday 4<sup>th</sup> July 2017 recording 24-hour two-way flows. Figure 9 shows the ATC location

### 7.3 Traffic Signal Data

Traffic signal data was supplied by RCTCBC for the Cardiff Rd / Ffordd Bleddyn signalised junction.

## 8 Base Traffic Flows

### 8.1 Junctions to be assessed

The junction assessment covers the three junctions listed below. These junctions have been identified as being potentially sensitive to an increase in vehicle movements associated with the proposed depot development.

- Ffordd Bleddyn Mini Roundabout (site entrance)
- Cardiff Rd / Ffordd Bleddyn signalised junction
- Moy Rd / Moy Rd Link T junction

The flow profile of a further 2 junctions have been considered to assess the likelihood of them being adversely impacted by the development proposals.

- A4054 / A470 / B4262 roundabout to the south of the site
- A468 / A470 Nant Garw Roundabout to the north

### 8.2 Base Traffic Data

The base traffic flow data for the assessments was based on the JTC and ATC data collected in June / July 2017. The ATC data was collected for a full two weeks (24 hours per day) while the JTC data was collected between the hours of 07:00 and 19:00 to cover both the AM and PM peak periods.

The signal staging for the Ffordd Bleddyn / Cardiff Road junctions was provided by RCTCBC in July 2017.

Analysis of the traffic data established that the peak hours for the junctions as AM 07:30 – 08:30 and PM 16:30 – 17:30. The existing AM and PM peak flows for the modelled junctions and are shown in Appendix C.

## 9 Forecast Future Year Base Traffic Flows

The future year traffic flows have been calculated for 2021 (opening year) and 2031 (design year). The flows represent the future situation without the Metro depot. The flows are based on the 2017 base traffic flows with the following adjustments:

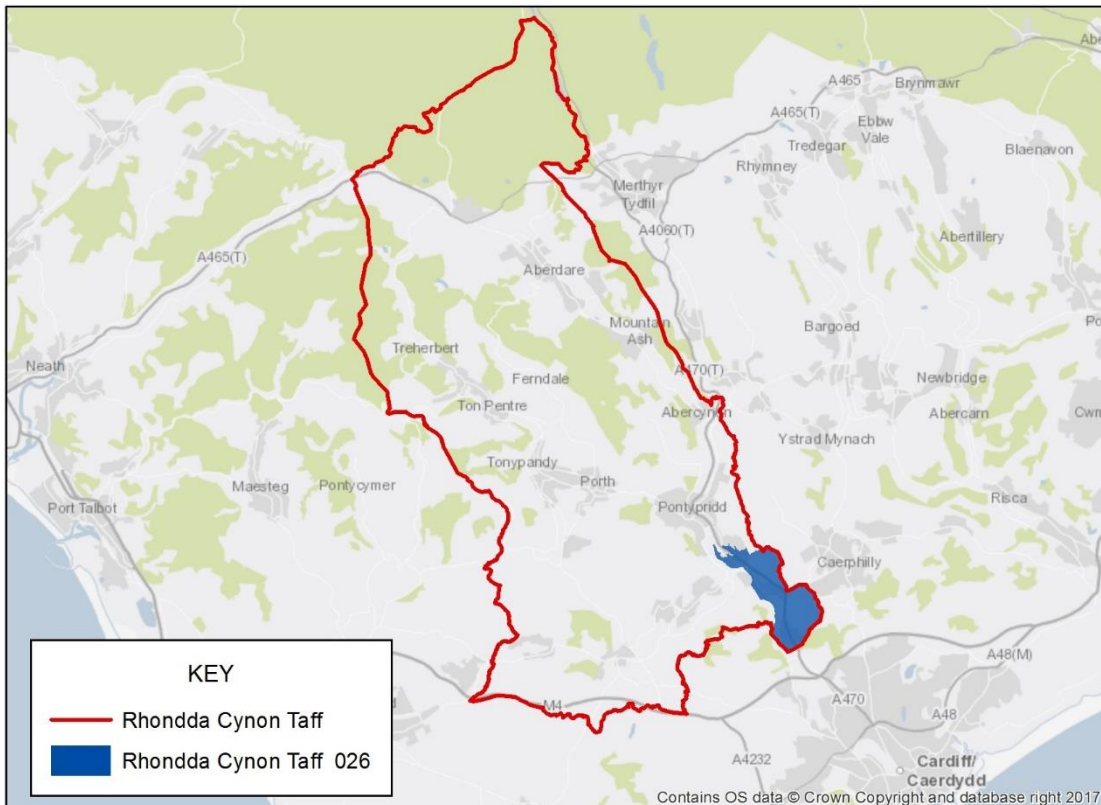
- Application of National Trip End Model 7.2 trip end Growth combined with National Transport Model (NTM) Traffic Growth forecasts; and
- Consideration of committed developments

The resultant future year base traffic flows are shown in Appendix C.

### 9.1 Growth Factors

TEMPro 7.2 has been used to obtain traffic growth factors for the Authority Rhondda Cynon Taf (RCT) area shown in Figure 10 and NTM traffic forecast dataset for an Urban Principle road. This was used as a worst-case traffic growth rate, producing higher growth for RCT in comparison to RCT 026, in which the development sits.

**Figure 10: Location Area Rhondda Cynon Taf TEMPro v7.2**



Source: Mott Macdonald

The resulting growth factors are shown in Table 4. For 2017 – 2021 the traffic growth is approximately 5%. Growth factors for 2017 to 2031 show peak period traffic growth of approximately 13% over the next 14 years.

**Table 4: Growth factors**

Year	Time Period	TEMPro Factor
TEMPro 2017 - 2021	AM Peak	1.0536
TEMPro 2017 - 2021	PM Peak	1.0521
TEMPro 2017 - 2031	AM Peak	1.1320
TEMPro 2017 - 2031	PM Peak	1.1294

Source: TEMPro v.7.2

## 9.2 Committed Developments

At the time of the assessment there were no committed developments in the vicinity of the proposed Metro site that had not already been completed. Therefore, no committed developments have been explicitly included in the future years flows as any future growth on the network is adequately accounted for through the application of the worst-case NTEM growth factor for RCT to the base flows.

# 10 Forecast Development Trip Generation

The Development traffic flows for Taffs Well Depot has been calculated for 2021 (opening year) and 2031 (design year).

## 10.1 Development Trip Generation

Forecast trips associated with the proposed development have been derived from information provided on rail service operations and other similar developments, giving the planned staffing levels expected for the operation of a maintenance and stabling facility accommodating up to 55 vehicles.

Calculations of development trips covers the following:

- Drivers
- Maintenance Staff
- Office Staff
- Operations Staff
- Cleaning (Vehicle and office)
- Deliveries (By road)

The calculations methodology and assumptions are set out below and Trip Generation figures are given in Appendix C.

## 10.2 Staff numbers

The assumptions made in relation to staff numbers and shift patterns were based on a review of the numbers of staff and the shift patterns used on other metro networks, whilst ensuring that all staff do not work excessive hours and safety critical staff work no more than the legally required number of hours, or hours that are agreed as part of any local agreement, where this is more generous than the legally required number of hours.

The shift patterns and levels of cover are based on a review of an existing metro operators shift patterns and cover levels (in the north east) as well as reviewing existing agreed contractual requirements relating to driver's hours, shift durations and lengths and durations of breaks.

The numbers relating to support, office and management staff, are based on experience gained reviewing similar operational structures for a city region based metro operation. Applying the same ratios of support, office and management staff to drivers, prorated to meet the number of actual drivers proposed for the South Wales Metro operation, and based on the numbers of existing staff that would be transferred across from the current operator.

The total staff numbers for the base year 2017 are based on the known rail service operations, shift patterns and the experience of similar facilities. Future staff numbers have been factored by 1.10 to obtain the staffing levels for 2021 (opening) and 2031 (design year). Table 5 provides a breakdown of total staff numbers by discipline.

**Table 5: Total staff**

Staff Type	Staff Number 2017	Staff Numbers 2021	Staff Numbers 2031
Drivers / Conductors /Operations	75	82	82
Maintenance	35	38	38
Office Staff	30	33	33
Cleaning (Metro Vehicles and Office etc)	12	14	14
<b>Total Staff</b>	<b>152</b>	<b>167</b>	<b>167</b>

Source: Mott Macdonald

### 10.3 Staff Travel to Work – Trip Rate Calculation

To convert the total staff on duty into forecast trip rate it is assumed that 90% will travel by car and 10% by public transport. To provide validation to this assumption census data was extracted for Taffs Well 2011 Travel to work, which show 87% of those working in Taffs Well commute by private motor vehicle. For robustness of assessment this figure was rounded up to 90%.

The ‘travel by car’ percentage was applied to the total staff numbers to calculate the staff travel to work trips by car profile for the proposed development for Opening and Design years.

**Table 6: Staff Commute - By Car**

Staff	2017	2021	2031
Total Staff	152	168	168
Factored / Trips by Car	132	145	145

Source: Mott Macdonald

To calculate an arrival and departure distribution profile, the known shift patterns were applied to the staff numbers calculated for 2021 (Opening) and 2031 (Design). The resulting profile is given in Table 7.

**Table 7: Staff Arrival and Departure Profile**

Time Period	Staff Arrive by Car 2021	Staff Depart by Car 2021	Staff Arrive by Car 2031	Staff Depart by Car 2031
00:00 – 00:30	0	0	0	0
00:30 – 01:00	0	0	0	0
01:00 – 01:30	0	0	0	0
01:30 - 02:00	0	0	0	0
02:00 – 02:30	0	0	0	0
02:30 - 03:00	0	0	0	0
03:00 – 03:30	0	0	0	0
03:30 – 04:00	0	0	0	0
04:00 – 04:30	0	9	0	9
04:30 – 05:00	10	0	10	0
05:00 – 05:30	0	5	0	5
05:30 – 06:00	26	0	26	0
06:00 – 06:30	0	6	0	6
06:30 – 07:00	0	8	0	8
07:00 - 07:30	0	0	0	0



Time Period	Staff Arrive by Car 2021	Staff Depart by Car 2021	Staff Arrive by Car 2031	Staff Depart by Car 2031
07:30 – 08:00	10	0	10	0
08:00 – 08:30	12	0	12	0
08:30 – 09:00	11	0	11	0
09:00 – 09:30	0	0	0	0
09:30 – 10:00	10	0	10	0
10:00 – 10:30	0	10	0	10
10:30 – 11:00	0	0	0	0
11:00 – 11:30	0	0	0	0
11:30 – 12:00	10	0	10	0
12:00 – 12:30	0	10	0	10
12:30 – 13:00	0	0	0	0
13:00 – 13:30	0	10	0	10
13:30 – 14:00	26	0	26	0
14:00 – 14:30	0	16	0	16
14:30 – 15:00	0	0	0	0
15:00 – 15:30	0	0	0	0
15:30 – 16:00	0	0	0	0
16:00 – 16:30	0	0	0	0
16:30 – 17:00	0	2	0	2
17:00 – 17:30	0	11	0	11
17:30 – 18:00	12	11	12	11
18:00 – 18:30	0	10	0	10
18:30 – 19:00	0	0	0	0
19:00 – 19:30	0	0	0	0
19:30 – 20:00	0	0	0	0
20:00 – 20:30	0	0	0	0
20:30 – 21:00	0	2	0	2
21:00 – 21:30	0	0	0	0
21:30 – 22:00	11	0	11	0
22:00 – 22:30	8	26	8	26
22:30 – 23:00	0	0	0	0
23:30 – 24:00	0	10	0	10

Source: Mott Macdonald

## 10.4 Other vehicle Trips

### 10.4.1 Light Goods Vehicles (LGVs)

It is expected that LGV movements into and out of the site will be minimal, but for robustness of assessment it is assumed there will be one LGV arrival and departure each hour. A flat distribution profile over an 8-hour time between 08:00 and 16:00 has been assumed and gives one arrival and one departure in the AM peak.

#### 10.4.2 Other Goods Vehicles (OGVs)

Based on information provided from similar known metro depots, the expected delivery profile and size of vehicles for OGVs accessing the site would be minimal after site construction is completed. The modelled trip profile assumes an average flat arrival / departure profile between 08:00 and 16:00.

#### 10.4.3 Future Years LGV and OGV Trip Generation

Future years OGV trips have been generated by factoring 2017 base by the percentage increase in operation of 10% for 2021 and 2031, in line with the expected level of operation.

#### 10.4.4 Trip Distribution

The development will be served by two access points off Ffordd Bleddyn;

- A general vehicle access into the depot site from the mini roundabout at the junction of Ffordd Bleddyn and Moy Road Link.
- Access road into the staff car park and public P&R provision on the decked area above Metro vehicle stabling.

For trip distribution purposes, the direction travelled to the depot has been assumed as;

- 50% travelling from the North, North East and North West accessing via Nant Garw.
- 50% travelling from the South, South East and South West via A4054 / A470 / B4262 Roundabout.

Of those travelling from areas to the north of the site, it has been assumed that half will turn onto Moy Rd and Moy Rd Link while the remaining trips will continue through Taffs Well Village and access Ffordd Bleddyn via Cardiff Rd signalised junction south of the site.

To determine the effect of the development generated traffic on the local highway network, trips associated with the development are added to the forecast base flows presented previously in Section 9 and Appendix C for future years 2021 and 2031 scenarios.

# 11 Junction Capacity Analysis

## 11.1 Background

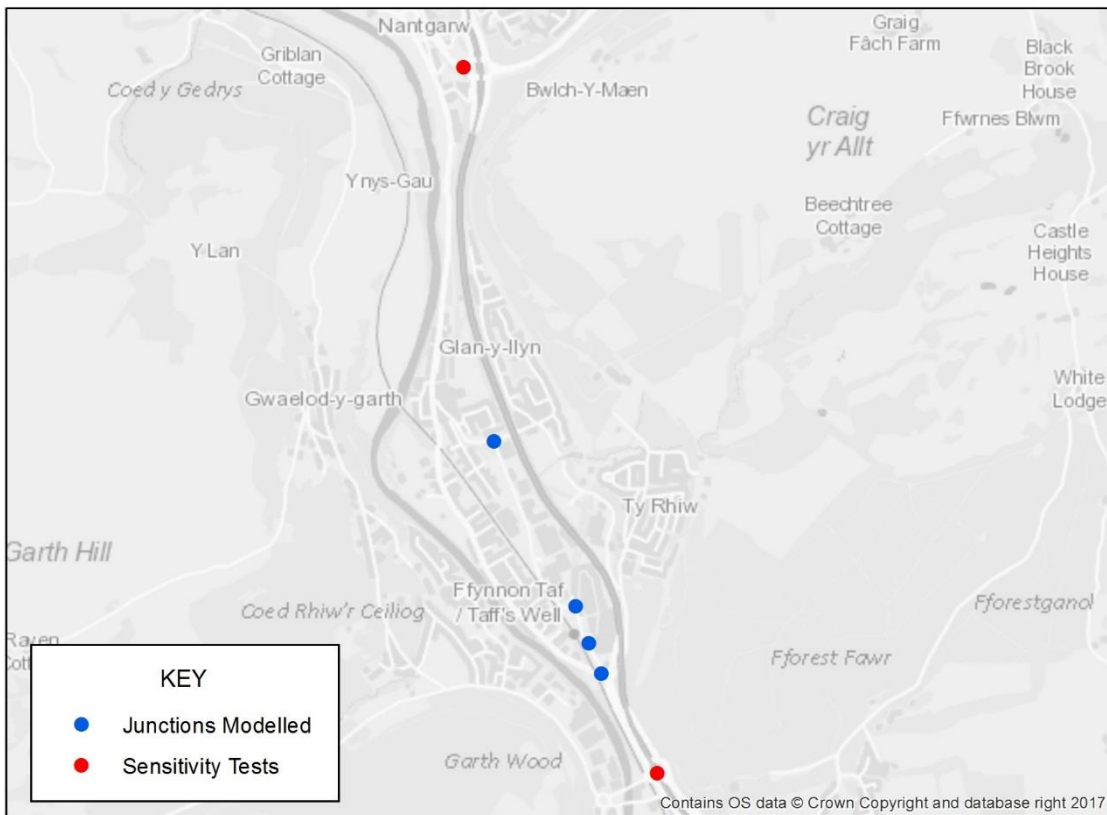
Junction capacity analysis has been undertaken for the main general site access, the car park access and the main junctions where development traffic will access the local highway network. The four junctions assessed are:

- Ffordd Bleddyn Mini Roundabout: The existing junction is a standard three arm mini roundabout, with Moy Rd Link to the West and a private Business access to the North. This junction will provide access directly into the proposed site with the addition of a fourth arm.
- Cardiff Rd / Ffordd Bleddyn: Three arm signalised junction (to the South). This junction is located approximately 150m south of the proposed main site access.
- Moy Rd / Moy Rd Link: A standard T junction.
- T junction Access to the decked car park off Ffordd Bleddyn.

It is noted that the junction of Cemetery Rd and Cardiff Road was assessed. No additional traffic would be expected to arrive at the site via Cemetery Rd and only an additional 13 vehicles would be expected on the Cardiff Rd/ Cemetery Rd link in the Peak hour, therefore no detrimental effect would be expected on the junction. This should be further reviewed in the next stage of design and consideration should be given to the concerns raised in the public exhibition of existing congestion issues.

The junction locations are shown in Figure 11.

**Figure 11: Modelled Junction Locations**



Source: Mott MacDonald

## 11.2 Modelling Software

Ffordd Bleddyn Mini Roundabout was modelled in ARCADY. Both the T junction on Moy Road and the car park were modelled in PICADY. These programmes are both components within TRL's industry-standard package 'Junctions 9' (version 9.0.1) for the modelling of roundabouts and priority junctions. They provide the assessment of the capacity and operation of a junction as a ratio of flow to capacity (RFC) and an estimate of maximum queue and delay. For roundabouts and priority junctions an RFC of 0.85 or less indicates the junction operates within desirable capacity. This allows for the standard error of prediction of the entry capacity by formula of + or -15% (DMRB vol. 6 TA 23/81). With a RFC between 0.85 and 1.00 a junction would be considered to operate within its theoretical capacity but will at times experience operational problems resulting in queues and delays. A RFC of greater than 1.00 indicates the junction is operate over maximum capacity and would become saturated, resulting in queuing and delays.

It should be noted for the Junctions 9 results presented, the maximum queue, delay and RFC are the 'worst' values over the total time period modelled (60 minutes), and therefore it is possible that each of the values are taken from a different time segment (divided into 15-minute time segments). Furthermore, the use of lane allocation within the model means the RFC values are provided for the entry lanes only, taking the 'worst case' result for a single-entry lane for the

worst time segment. The queue and delay values stated in the tables are for all lanes of an arm (Worst entry and approach lane queues / delays added together.) for the worst time segment.

For the Ffordd Bleddyn / Cardiff Rd signalised junction LinSig (version 3.2.27.0) software has been used. Output from LinSig provides Degree of Saturation (DoS), delay and queue length as the primary measures of performance. For traffic signals a DoS of 90% or less indicates the junction operates within capacity. A DoS of 90% to 100% indicates the junction will at times experience operational problems resulting in queues and delays. A DoS of greater than 100% indicates the junction is operating over capacity.

### 11.3 Capacity Assessment Scenarios

The junction capacity assessment has been undertaken for the current layout and proposed layout for all junctions in the AM and PM peak periods in the following scenarios.

- Base 2017
- Base 2021
- Base + Development 2021
- Base 2031
- Base + Developments 2031

### 11.4 Ffordd Bleddyn Signalised Junction Analysis

The Cardiff Rd (A4054) / Ffordd Bleddyn signalised junction, base flows and base + development flows have been tested for the existing and proposed scenarios. The results are presented in Tables 8 to 12. The full output reports are provided in Appendix D.

Table 8 shows the existing junction operates satisfactorily for 2017 base flows.

**Table 8: Cardiff Rd / Ffordd Bleddyn – Base 2017**

Movements	AM DoS	AM Queue (PCU)	PM DoS	PM Queue (PCU)
Ffordd Bleddyn	74.6%	10.2	47.8%	8.4
Cardiff Rd East	79.6%	13.0	71.0%	17.2
Cardiff Rd West	88.6%	15.5	81.4%	11.0
	PRC (%) 1.6		PRC (%) 10.5	

Source: Mott MacDonald

The assessment results show the junction is operating within desirable capacity in both the AM and PM peak hours for the base 2017 scenario, with DoS values under 90%.

**Table 9: Cardiff Rd / Ffordd Bleddyn - Base 2021**

Movements	AM DoS	AM Queue (PCU)	PM DoS	PM Queue (PCU)
Ffordd Bleddyn	76.9%	10.7	49.9%	8.8
Cardiff Rd East	83.3%	14.1	73.8%	18.3
Cardiff Rd West	92.3%	17.5	85.1%	12.0
	PRC (%) -2.6		PRC (%) 5.7	

Source: Mott MacDonald

The results show the junction is operating within desirable capacity in the PM peak and theoretical capacity in the AM peak base 2021 scenario, with DoS values between 90-100% on the Cardiff Road West arm (92.3%) with a mean max queue of 17 PCUs.

**Table 10: Cardiff Rd / Ffordd Bleddyn - Base + Developments 2021**

Movements	AM DoS	AM Queue (PCU)	PM DoS	PM Queue (PCU)
Ffordd Bleddyn	76.9%	10.7	51.6%	9.1
Cardiff Rd East	85.6%	14.9	74.0%	18.4
Cardiff Rd West	93.5%	18.2	85.1%	12.0
	PRC (%) -3.9		PRC (%) 5.7	

Source: Mott MacDonald

The results show that in the 2021 Base + Development scenario the junction is operating within desirable capacity in the PM peak and theoretical capacity in the AM peak with DoS values between 90-100% on the Cardiff Road West arm (93.5%) with a mean max queue of 18 PCUs.

**Table 11: Cardiff Rd / Ffordd Bleddyn - Base 2031**

Movements	AM DoS	AM Queue (PCU)	PM DoS	PM Queue (PCU)
Ffordd Bleddyn	80.6%	11.6	52.9%	9.5
Cardiff Rd East	88.4%	16.1	78.1%	20.1
Cardiff Rd West	97.9%	22.4	90.5%	13.9
	PRC (%) -8.8		PRC (%) -0.6	

Source: Mott MacDonald

The results show the junction is operating within theoretical capacity in both the AM and PM peak hours for the Base 2031 scenario, with DoS values between 90-100%. In the AM peak and PM Peak on Cardiff Road West. The AM peak shows the highest DoS value of 97.9% with a mean max queue of 22 PCUs. In the PM peak the results give a DoS of 90.5% with a mean max queue of 14 PCUs.

**Table 12: Cardiff Rd / Ffordd Bleddyn - Base + Developments 2031**

Movements	AM DoS	AM Queue (PCU)	PM DoS	PM Queue (PCU)
Ffordd Bleddyn	80.6%	11.6	54.6%	9.8
Cardiff Rd East	90.6%	17.3	78.3%	20.2
Cardiff Rd West	99.1%	23.8	90.5%	13.9
	PRC (%) -10.1		PRC (%) -0.6	

Source: Mott MacDonald

The results show the junction is operating within theoretical capacity in both the AM and PM peak hours for the Base + Development 2031 scenario, with DoS values between 90-100%. In the AM peak both Cardiff Road West and Cardiff Road East presents with DoS value of 99.1% and 90.6% respectively, with a mean max queue of 24 and 14 PCUs. In the PM peak Cardiff Road West operate at theoretical capacity with a DoS of 90.5% and a mean max queue of 14 PCUs.

## 11.5 Linsig Model Summary

Table 14 below compares the DoS for Cardiff Road West and Cardiff Road East in all the scenarios.



**Table 13: Cardiff Road / Ffordd Bleddyn Modelling Summary Tables**

Year	Scenario	AM DoS	AM DoS	PM DoS	PM DoS
		Cardiff Rd West	Cardiff Rd East	Cardiff Rd West	Cardiff Rd East
2017	Base	88.6%	79.6%	81.4%	71.0%
2021	Base	92.3%	83.3%	85.1%	73.8%
	Base + Development	93.5%	85.6%	85.1%	74.0%
2031	Base	97.9%	88.4%	90.5%	78.1%
	Base + Development	99.1%	90.6%	90.5%	78.3%

Source: Mott MacDonald

Overall the assessment results indicate that the junction operates within desirable capacity on all arms in the 2017 Base scenario. By 2021 the junction is operating within theoretical capacity on Cardiff Road West for both the Base and With Developments scenarios in the AM peak. In 2031 Cardiff Road East is operating within theoretical capacity with the development and Cardiff Rd West is within theoretical capacity for Base and With Development scenarios in both the AM and PM Peak periods. The results indicate that the junction will be approaching capacity by 2031 with or without the development of Taffs Well depot.

## 11.6 Ffordd Bleddyn - Mini Roundabout Junction Analysis Existing Scenario

The results for each scenario tested can be found in Tables 14 to 16, with the full output reports available in Appendix D.

**Table 14: Ffordd Bleddyn – Base 2017**

Movements	AM Queue (PCU)	AM Delay (sec)	AM RFC	PM Queue (PCU)	PM Delay (sec)	PM RFC
Private Access	0.0	3.52	0.02	0.0	2.96	0.02
Ffordd Bleddyn	0.1	2.80	0.10	0.2	3.21	0.17
Moy Road Link	0.6	6.17	0.37	0.2	4.58	0.19

Source: Mott MacDonald

The assessment results show the junction is operating within desirable capacity in both the AM and PM peak hours for the base 2017 scenario, with RFC values under 0.85.

**Table 15: Ffordd Bleddyn – Base 2021**

Movements	AM Queue (PCU)	AM Delay (sec)	AM RFC	PM Queue (PCU)	PM Delay (sec)	PM RFC
Private Access	0.0	3.58	0.02	0.0	2.98	0.02
Ffordd Bleddyn	0.1	2.81	0.10	0.2	3.24	0.18
Moy Road Link	0.7	6.36	0.39	0.2	4.64	0.20

Source: Mott MacDonald

The assessment results show the junction is operating within desirable capacity in both the AM and PM peak hours for the base 2021 scenario, with RFC values under 0.85.

**Table 16: Ffordd Bleddyn – Base 2031**

Movements	AM Queue (PCU)	AM Delay (sec)	AM RFC	PM Queue (PCU)	PM Delay (sec)	PM RFC
Private Access	0.0	3.67	0.03	0.0	3.02	0.02
Ffordd Bleddyn	0.1	2.84	0.11	0.3	3.29	0.19
Moy Road Link	0.8	6.69	0.42	0.3	4.73	0.21

Source: Mott MacDonald

The assessment results show the junction is operating within desirable capacity in both the AM and PM peak hours for the base 2031 scenario, with RFC values under 0.85.

The assessment results show that the junction currently operates within desired capacity with the highest RFC of 0.59, a queue of 1 PCU and Delay of 9.2 seconds. By 2031 the RFC would be expected to rise to 0.67 with a queue of 2 PCUs and delay of 11 seconds.

### 11.7 Ffordd Bleddyn Mini Roundabout Junction Analysis Revised Lay-out

To provide a main access point into the proposed depot site, the existing Ffordd Bleddyn / Moy Rd Link mini roundabout would be upgraded to provide a fourth arm. The layout is shown in Appendix B. The results for each scenario tested can be found below in Table 17 and 18, with full output reports available in Appendix D.

**Table 17: Ffordd Bleddyn Base + Development 2021 (Revised Layout)**

Movements	AM Queue (PCU)	AM Delay (sec)	AM RFC	PM Queue (PCU)	PM Delay (sec)	PM RFC
Private Access	0.0	6.18	0.04	0.0	5.03	0.03
Development Access	0.0	0.0	0.0	0.0	0.0	0.0
Ffordd Bleddyn	0.1	2.87	0.10	0.2	3.31	0.18
Moy Road Link	0.7	6.69	0.40	0.3	4.79	0.20

Source: Mott MacDonald

The assessment results show the junction is operating within desirable capacity in both the AM and PM peak hours for the base + development 2021 scenario, with RFC values under 0.85.

**Table 18: Ffordd Bleddyn Base + Development 2031 (Revised Layout)**

Movements	AM Queue (PCU)	AM Delay (sec)	AM RFC	PM Queue (PCU)	PM Delay (sec)	PM RFC
Private Access	0.0	6.38	0.04	0.0	5.10	0.04
Development Access	0.0	0.0	0.0	0.0	0.0	0.0
Ffordd Bleddyn	0.1	2.89	0.11	0.3	3.37	0.2
Moy Road Link	0.8	7.06	0.43	0.3	4.88	0.22

Source: Mott MacDonald

The assessment results show the junction is operating within desirable capacity in both the AM and PM peak hours for the base + development 2031 scenario, with RFC values under 0.85.

The results presented above for the base and development scenarios all illustrated that the junction with the revised layout performs well within desirable capacity for year 2031 in both excluding the development and with development scenario.

### 11.8 Moy Road / Ffordd Bleddyn T Junction

The results for each scenario tested can be found in Tables 19 to 23, with the full output reports available in Appendix D.

**Table 19: Moy Road / Ffordd Bleddyn – Base 2017**

Movements	AM Queue (PCU)	AM Delay (sec)	AM RFC	PM Queue (PCU)	PM Delay (sec)	PM RFC
Ffordd Bleddyn	0.2	7.60	0.18	0.8	11.44	0.43
Moy Road West	0.9	11.87	0.47	0.3	7.73	0.23

Source: Mott MacDonald

The assessment results show the junction is operating within desirable capacity in both the AM and PM peak hours for the base 2017 scenario, with RFC values under 0.85.

**Table 20: Moy Road / Ffordd Bleddyn – Base 2021**

Movements	AM Queue (PCU)	AM Delay (sec)	AM RFC	PM Queue (PCU)	PM Delay (sec)	PM RFC
Ffordd Bleddyn	0.3	7.70	0.19	0.9	12.01	0.46
Moy Road West	1.0	12.47	0.49	0.3	7.86	0.25

Source: Mott MacDonald

The assessment results show the junction is operating within desirable capacity in both the AM and PM peak hours for the base 2021 scenario, with RFC values under 0.85.

**Table 21: Moy Road / Ffordd Bleddyn – Base + Developments 2021**

Movements	AM Queue (PCU)	AM Delay (sec)	AM RFC	PM Queue (PCU)	PM Delay (sec)	PM RFC
Ffordd Bleddyn	0.3	9.41	0.22	1.2	16.87	0.54
Moy Road West	1.1	12.80	0.50	0.3	7.87	0.25

Source: Mott MacDonald

The assessment results show the junction is operating within desirable capacity in both the AM and PM peak hours for the base + development 2021 scenario, with RFC values under 0.85.

**Table 22: Moy Road / Ffordd Bleddyn – Base 2031**

Movements	AM Queue (PCU)	AM Delay (sec)	AM RFC	PM Queue (PCU)	PM Delay (sec)	PM RFC
Ffordd Bleddyn	0.3	7.90	0.21	1.0	12.87	0.49
Moy Road West	1.2	13.53	0.53	0.4	8.03	0.26

Source: Mott MacDonald

The assessment results show the junction is operating within desirable capacity in both the AM and PM peak hours for the base 2031 scenario, with RFC values under 0.85.

**Table 23: Moy Road / Ffordd Bleddyn – Base + Developments 2031**

Movements	AM Queue (PCU)	AM Delay (sec)	AM RFC	PM Queue (PCU)	PM Delay (sec)	PM RFC
Ffordd Bleddyn	0.3	9.70	0.24	1.4	18.58	0.58
Moy Road West	1.3	13.85	0.54	0.4	8.05	0.27

Source: Mott MacDonald

The assessment results show the junction is operating within desirable capacity in both the AM and PM peak hours for the base + development scenario, with RFC values under 0.85.

The results presented above for the base and development scenarios all illustrated that the junction performs well within desirable capacity in all future year scenarios, both excluding the development and with the planned development.

## 11.9 Ffordd Bleddyn / Car Park Access

The development plans include a replacement car park access on the east side of Ffordd Bleddyn, to provide an entrance to the replacement P&R spaces and the main depot staff car park. The Base network analysis shown in tables 24 to 28 tests the existing P&R site entrance.

**Table 24: Ffordd Bleddyn / Car park – Base 2017**

Movements	AM Queue (PCU)	AM Delay (sec)	AM RFC	PM Queue (PCU)	PM Delay (sec)	PM RFC
Car Park Access	0.0	0.00	0.00	0.0	7.79	0.04
Ffordd Bleddyn South	0.0	5.81	0.02	0.0	5.48	0.00

Source: Mott MacDonald

The assessment results show the junction is operating within desirable capacity in both the AM and PM peak hours for the base scenario, with RFC values under 0.85.

**Table 25 Ffordd Bleddyn / Car park – Base 2021**

Movements	AM Delay (sec)	AM Delay	AM Delay (sec)	PM Queue	PM Delay (sec)	PM RFC
Car Park Access	0.0	0.00	0.00	0.0	7.93	0.05
Ffordd Bleddyn South	0.0	5.80	0.02	0.0	5.46	0.00

Source: Mott MacDonald

The assessment results show the junction is operating within desirable capacity in both the AM and PM peak hours for the base scenario, with RFC values under 0.85.

**Table 26: Ffordd Bleddyn / Car park – Base + Developments 2021 Revised Layout**

Movements	AM Delay (sec)	AM Delay	AM Delay (sec)	PM Queue	PM Delay (sec)	PM RFC
Car Park Access	0.0	0.00	0.00	0.0	7.95	0.05
Ffordd Bleddyn South	0.0	5.81	0.02	0.0	5.42	0.00

Source: Mott MacDonald

The assessment results show the junction is operating within desirable capacity in both the AM and PM peak hours for the base + development scenario, with RFC values under 0.85.

**Table 27: Ffordd Bleddyn / Car park – Base 2031**

Movements	AM Delay (sec)	AM Delay	AM Delay (sec)	PM Queue	PM Delay (sec)	PM RFC
Car Park Access	0.0	0.00	0.00	0.1	7.99	0.05
Ffordd Bleddyn South	0.0	5.79	0.02	0.0	5.43	0.00

Source: Mott MacDonald

The assessment results show the junction is operating within desirable capacity in both the AM and PM peak hours for the base scenario with RFC values under 0.85.

**Table 28: Ffordd Bleddyn / Car park – Base + Developments 2031 Revised Layout**

Movements	AM Delay (sec)	AM Delay	AM Delay (sec)	PM Queue	PM Delay (sec)	PM RFC
Car Park Access	0.0	0.00	0.00	0.1	8.00	0.05
Ffordd Bleddyn South	0.0	5.80	0.02	0.0	5.42	0.00

Source: Mott MacDonald

The assessment results show the junction is operating within desirable capacity in both the AM and PM peak hours for the base + development scenario, with RFC values under 0.85.

In conclusion, the results show that the junction performs well with desirable capacity in the AM and PM peak periods with or without the development traffic.

### 11.10 Junction Sensitivity Tests

Two additional junctions were assessed at the request of Welsh Government, due to existing congestion issues. The junctions of interest are listed below.

A470 / A468 Nant Garw (North of Development)

A4054 / A470 / B4262 Roundabout (South of Development)

The AM and PM peak hour development traffic from both the North and South of the site is shown in Table 29.

**Table 29: Total Peak hour development traffic by direction 2021**

Direction	AM Peak	PM Peak
North	6	4
South	6	4

Source: Mott Macdonald

For both junctions, the development peak hour traffic flow of 6 and 4 vehicles respectively is well within 5% of the total therefore the assessment concludes the development would have no significant effect on the peak hours operation of either junction.



# 12 Parking and Servicing

## 12.1 Introduction

This section sets out the results of calculations undertaken to assess the daily motor vehicle parking requirements for staff at the proposed depot site.

## 12.2 Current Land Use

The proposed development site is currently an active employment site containing a number of operational industrial units and ancillary buildings, together with associated areas for storage and parking and encompasses the existing heavy rail surface P&R facility.

The surrounding area is made up of a mix of residential dwellings beyond the railway line, which are bound by the River Taff and an industrial area to the north and north west containing Logistics companies and warehouse units. To the east is the A470 and beyond it further industrial and residential developments.

## 12.3 Proposed Development

The proposed depot development design and essential facilities are envisaged to include; office space, maintenance workshops, stabling for up to 25 rolling stock vehicles, vehicle wash, control room, traction substation, rail vehicle delivery, operational welfare accommodation, etc. required to maintain and operate a fleet of Metro vehicles.

A decked car park over part of the sidings will be constructed as the main staff car park and replacement public P&R spaces.

The assessment of car parking supply for the Metro operation and maintenance has taken account of several factors, including;

- Location
- Staff numbers
- Availability of Public Transport
- Shift Patterns
- RCTCBC Parking Policy

## 12.4 Policy Context

This section sets out RCTCBC'S parking standards that are used in assessing proposals for new developments.

Planning Policy Wales Edition 9 2011 states that "Car parking provision is a major influence on the choice of means of transport and the pattern of development, local authorities should ensure that new developments provide lower level of parking than has generally been achieved in the past. Minimum parking standards are no longer appropriate. Local Authorities should develop an integrated strategy on parking to support the overall transport and locational policies of the development plan".

Technical Advice Note 18 Transport (2007) which supplements Planning Policy Wales, states that "maximum car parking standards should be used at regional and local level as a form of

demand management for new development, regards should be given to alternative transport modes, economic objectives, public and shared parking”.

The new approach of managing traffic and reducing car dependencies aims to ensure that developments are accompanied by sufficient parking spaces for cars and service vehicles to avoid the need for vehicles parking on street and thereby causing congestion, danger or visual intrusion.

The following parking zones are considered appropriate for Rhondda Cynon Taf:

- Zone 1 - Town centre, relates to the principle town centres.
- Zone 2 - Urban, includes key settlements which contain a range of basic local facilities within 400m walking distance.
- Zone 3 - Suburban or near Urban, comprises of all the remaining urban area outside of Principle towns and Key settlements.
- Zone 4 Countryside, comprises the remainder of the borough

The Proposed Taffs Well Depot sits within Zone 3 Class B2 as shown in Figure 13.

**Figure 13: Use Class – Land Use in Parking Guidelines**

Use Classes	Land Use in Parking Guidelines
Class A1: Shops	Shops, post offices, travel agents, hairdressers, funeral directors, dry cleaners
Class A2: Financial & Professional Services	Banks, building societies, betting offices, and other financial and professional services
Class A3: Food & Drink	Pubs, restaurants, cafes and hot food take-aways
Class B1: Business	Offices, research and development, light industry appropriate in a residential area.
Class B2: General Industrial	Industry.
Class B8: Distribution, including open air storage	Wholesale warehousing
Class C1: Hotels	Hotels, boarding and guest houses no significant elements of care is provided.
Class C2: Residential Institutions	Residential care homes, hospitals, nursing homes, boarding schools, residential colleges and training centres
Class D1: Non-Residential Institution	Surgeries, nurseries, day centre, schools, art galleries, museums, libraries, halls, churches, cinemas, concert halls, bingo and dance halls, casinos, swimming baths, skating rinks, gymnasiums or sports arenas (except for motor sports, or where firearms are used).
Class D2 Assembly and leisure	

Source: Local Development Plan. Supplementary Planning Guidance: Delivering Design and Placemaking: Access, Circulation and Parking requirements

## 12.5 Parking Requirements

The Guidance notes:

- Employment density for industrial usage allows 35 - 45m<sup>2</sup> per employee.
- For premises above 2000m<sup>2</sup> Gross Floor Area (GFA), the required minimum operational area should be taken as 10% of GFA.
- Table 30: General Industry Distribution and Storage, Zones 2, 3 & 4

Type of Development	Non-Operational	Operational Requirements
General industry (>235m <sup>2</sup> )	1 Space per 80m <sup>2</sup>	Above 2000m <sup>2</sup> a minimum of 10% operations space
B1, B2 Office space (>1000m <sup>2</sup> )	1 space per 25 – 40m <sup>2</sup>	

Source: Delivering Design and Place making, Access, Circulation and Parking Requirements.

The total gross floor area of the development is approximately 6642m<sup>2</sup>. The parking requirement has been calculated at a rate of 1 parking space per 80m<sup>2</sup> for the 4270m<sup>2</sup> of workshop areas

and 1 parking space per 25m<sup>2</sup> for the 2372m<sup>2</sup> of office space provision, giving a non-operational parking provision of 120 spaces. 20 operational spaces will be provided at ground level for plant vehicles, delivery vehicles and other operational related vehicles.

## 12.6 Cycle Parking

Long stay cycle parking for staff should be provided, located in a safe, secure and convenient location.

Planning requires:

For offices: 1 stand per 200m<sup>2</sup>.

For Industrial and Warehousing: 1 stand per 500m<sup>2</sup>.

## 12.7 Motorcycle parking

For all classes of development, a motorcycle parking provision of 5% of provision for cars should be made.

## 12.8 Parking Guidance for Disabled People

The guidance recommends for car parking associated with new employment premises. 5% of the total car park capacity should be provided.

## 12.9 Parking provision

Parking provision has been calculated in line with RCT's Planning Guidance.

Due to the proposed depot layout and vertical re-alignment of Ffordd Bleddyn, it is necessary to adjust the current parking facilities. The existing car park on the depot site will be closed and the existing Taffs Well Station P&R car park will have 9 spaces removed. A new car park is proposed on the upper deck over the depot stabling tracks with a total capacity of 214 vehicles. Of which 120 is proposed for the depot staff and visitors and 94 for the public, compensating for the closed car park at ground level and reduction in P&R in the station car park. Up to 20 spaces on the main depot site at ground level will be designated for operational parking. These will be used by vehicles essential to the operation of the site and short-term delivery vehicles.

The existing footbridge over the main railway line at Taffs Well station will be removed and replaced with a new, extended one, enabling direct access from the upper deck car park to the station platforms via stairs and lifts.

The parking provision is also presented in table 31 below.

**Table 31: Parking Provision**

Parking Areas	Existing provision	Proposed Provision	Net Provision
Taff Well Main P&R provision	93	84	+ 30
Overflow Rail Station P & R	55	94	
Staff and Visitor Parking on Depot site	104 Approx Marked Parking Bays + adhoc Parking	120	
Operational Vehicle Parking	adhoc spaces throughout the site for operational vehicles	20 spaces on the main site for operational vehicles and deliveries	

Source: Mott Macdonald

The parking provision should be further reviewed in the next stage of design and consideration should be given to the concerns raised in the public exhibition of the existing problem with rail users parking in the nearby streets when the station car park is full. We have been informed this is a daily problem.

### 12.10 Park and Ride Site

The development proposals will give an additional 30 P&R spaces. From the available traffic count information, 67% of the trips accessing the P&R site arrive from the north via Moy Rd therefore, of the 30 additional spaces, it is expected that only 10 trips would arrive via Cardiff Road signalised junction during the course of the day. If for a robust assessment we assume that these vehicles all arrive in the peak hour, it would give 1 additional vehicle per 6 minutes. This level of additional traffic would not be expected to adversely affect the Cemetery Rd/ Cardiff Rd Junction.

# 13 Construction

## 13.1 Introduction

According to the estimated programme based on the current layout, which is subject to change once the preferred bidder is appointed by TFW, the Taffs Well Depot is anticipated to open in Q4 of 2021. Construction of the depot and associated works is estimated to take approximately 2 and a half years with construction starting in Q2 2019. It must be noted the programme is indicative only and is subject to change after appointment of the preferred ODP and development of their detailed design.

The enabling works is scheduled to begin in Q2 2019. Over approximately 3 months during Q1 of 2020, a temporary station P&R site will be prepared and a temporary road will be constructed through the development site to allow construction of the rolling stock access bridges and raising the level of Ffordd Bleddyn to pass over these bridges.

The primary access route for construction of the enabling works will be from the south via the A470 and A4054, as detailed below in section 13.3.

## 13.2 Construction Management Plan

The ODP will be required to provide a Construction Management Plan (CMP) setting out their method statement detailing a construction programme and clearly demonstrating (via a Construction Traffic Plan) how vehicle movements will be managed to meet the programme constraints, minimise disruption and operate safely. The plan will also be expected to detail provision of transport for constructional personnel to minimise the impact on the surrounding road network. It will be made clear to contractors that construction and delivery vehicle movements off site are to be routed via the trunk road network and not the minor residential streets in the surrounding area. This will primarily be the A470 and M4 motorway, acknowledging that a small number of vehicles will access from the North via Cardiff Rd.

## 13.3 Construction Routes

### 13.3.1 Enabling Works

The enabling works include construction of the temporary access road, raising of Ffordd Bleddyn to facilitate construction of two bridges for rail vehicle site access, construction of a main depot access arm off the existing mini roundabout and construction of a new station P&R access to the north of the existing P&R site.

For construction of the temporary road and P&R facility through the proposed development site, the primary access route will be via A470, Cardiff Rd and Ffordd Bleddyn.

Once the temporary access road is complete, the Ffordd Bleddyn modifications will commence. The main access for construction vehicles will be via the temporary road which will extend from the Cardiff Rd / Ffordd Bleddyn signalised Junction to the mini roundabout.

The Ffordd Bleddyn enabling works are proposed to commence in Q1 of 2020 followed by the depot construction in Q3 of 2020.

For construction of the depot, the primary construction route will be from the modified Ffordd Bleddyn off the mini roundabout.

### 13.4 Main Site development – Construction of Taffs Well Depot

Based on the current depot layout, which is subject to change after appointment of the preferred bidder, construction of the new rolling stock depot is scheduled over 12 months between Q3 2020 and Q3 2021. These works will commence upon completion of the enabling works on Ffordd Bleddyn. The construction compound will be located within the development site and will include car and cycle parking for staff and laydown areas as required by the contractor.

During construction it is envisaged that there will be daily deliveries of plant, equipment and materials, with peak flows matching site activities. Wherever possible the contractor will be constrained to making these deliveries at a time to avoid general peak traffic flows. Storing materials on site will help in achieving this.

For concrete pours, materials will be delivered as required. It is envisaged that for major concrete pours, such as the ground slab and foundation to the workshop, that a concrete wagon will be arriving and leaving the site every ten minutes over the course of a few hours. Major pours of the maintenance workshop foundation may take most of a day and would need to be continuous. The number of days on which this occurs would be relatively small over the course of the construction programme.

For other large deliveries, such as the steelwork for the maintenance workshop, it is envisaged that the contractor would wish to have a just in time delivery arrangement to avoid double handling of materials. These could be 2 or 3 HGV deliveries a day.

Site worker access (personal transport to / from site) will be limited as far as possible by employing measures such as lift share, P&R and encouraging cycling or other sustainable forms of transport. The appointed contractor will be expected to provide a Construction Management Plan which will include a construction travel plan setting out how the contractor will minimise the impact of construction vehicles and staff vehicles during the development works.



# 14 Collision Analysis

## 14.1 Collision Data

Collision data for the last five year period has been obtained from South Wales Police, through the Freedom of Information Request 975/17 The latest available data is between 01/01/2012 to 01/06/2017

Collision data request for the following areas:

- A4054 Cardiff Rd
- Moy Rd
- Ffordd Bleddyn
- A468 Nant Garw

In the response from the South Wales Police (3<sup>rd</sup> October 2017) it states the data was obtained using the following searches:

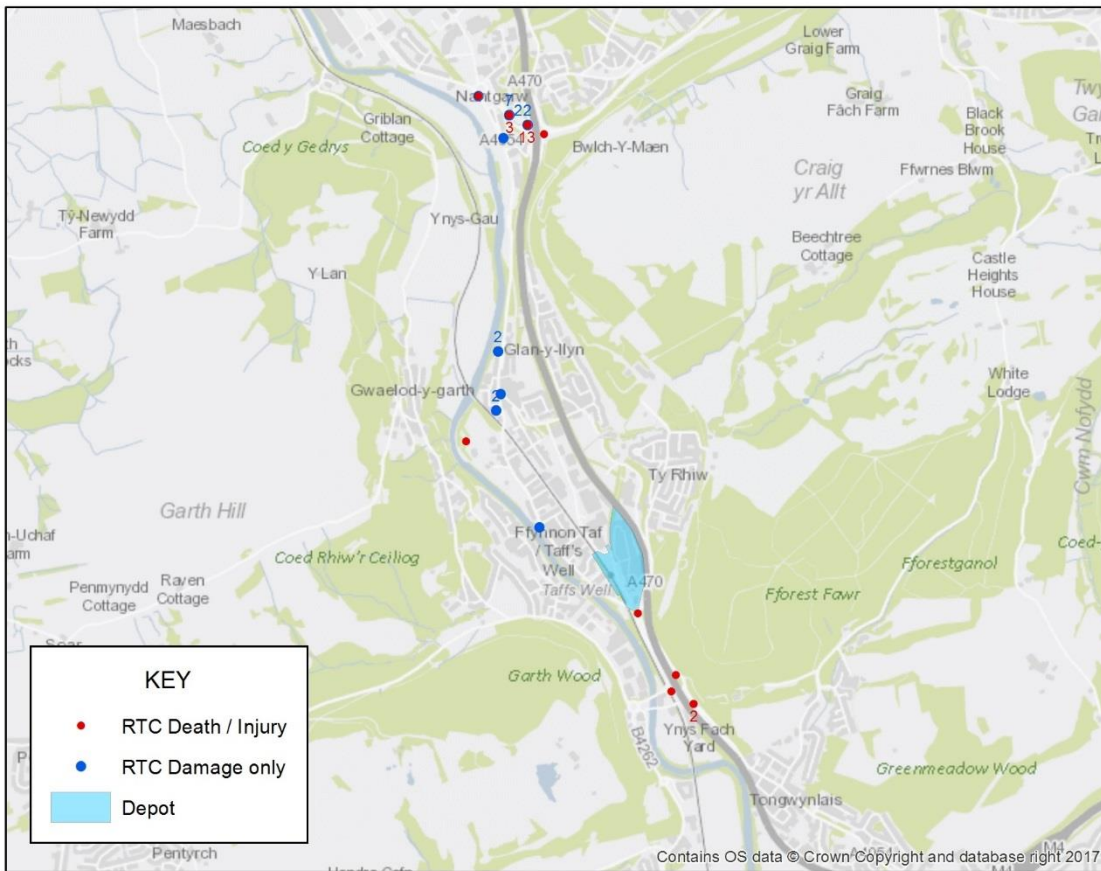
- All occurrences on the Crime and Incident Recording System (Niche Record Management System) with a Personal Injury Road Traffic Collision statistic form; and
- A search where the occurrence type includes Traffic Related (TR) and contains damage incidents, Road Traffic Collision (RTC) or accident.

It should be noted that officers do not attend every RTC, and where this is the case, a precise location may not be available and generic map points are used to indicate the vicinity of the RTC.

## 14.2 Collision Summary Analysis

Across the required area a total of 81 were reported in the 5 year period, of these 38 were classified as damage only, 3 as highway disruption, 3 as Road Related Offences and 36 as death or injury, the data supplied does not distinguish accident severity. The locations of damage only and Death and injury are shown in Figure 12

**Figure 12: Collision Location 2012 - 2017**



Source: Mott MacDonald

A summary of Collision data by location and year is shown in Tables 32 and 33.

**14.2.1 A4054**

**Table 32: Collision Summary Table A4054**

Year	Damage Only	Death and Injury
2012	6	1
2013	2	4
2014	1	2
2015	2	1
2016	2	2
2017	2	1

Source: South Wales Police 2017

For the A4054 from Tongwynlais to Nant Garw / Caerphilly Road Roundabout a total of 26 collisions were recorded over a five-year period, of those 15 were damage only and 11 recorded as Death and Injury.

**Table 33: Collision Summary Table A468 Nant Garw**

Year	Damage Only	Death and Injury
2012	4	1
2013	6	4
2014	3	10
2015	3	5
2016	8	6
2017	2	0

Source: South Wales Police 2017

For the A468 from Nant Garw / a total of 52 collisions were recorded over a five year period, of those 26 were damage only and 26 recorded as Death and Injury.

#### 14.2.2 Ffordd Bleddyn and Moy Road

There are no recorded incidents in the vicinity of the development site on Ffordd Bleddyn or Moy Road over the five year period considered.

#### 14.3 Summary

The area located within the immediate vicinity of the proposed site access on Ffordd Bleddyn presents minimal concern with regards to collision data results with no incidents recorded on Ffordd Bleddyn / Moy Rd in the five years considered and only six Damage only and one Death and injury incidents on the A4054 through Taffs Well village. Therefore, any increase in traffic flow from the South Wales Metro Depot would not be expected to adversely affect the incident rate in the area.

# 15 Conclusions

This Transport Assessment has been prepared by Mott MacDonald on behalf of TfW in support of the planning submission for a new South Wales Metro rolling stock depot in Taffs Well in the south of Rhonda Cynon Taf. The proposed new facility will provide stabling capacity for up to twenty-five metro rail vehicles, a maintenance facility and accommodation for operation and office staff required to run the depot.

The development is classed as 'enabling' infrastructure, as it is part of the investment required to transform the CVL. Additional depot and stabling facilities are required to accommodate the new fleet of rolling stock, allowing the new Wales and Borders Service provider to run a higher frequency and more reliable service on the CVL.

The work has been undertaken in line with national, regional, and local policy guidance and the Active Travel Wales Act 2013 and in consultation with Rhonda Cynon Taf County Borough Council and Welsh Government.

The site location benefits from excellent local transport infrastructure with:

- Easy access from the local trunk road network;
- Good pedestrian access from local centres and public transport.
- Cyclists will be able to access the site via the national cycle network which runs adjacent to the site. Suitable cycle storage and facilities will be provided to encourage sustainable mode use.
- Good bus and rail service provision within 200m of the site.

## 15.1 Capacity Analysis

Capacity analysis has been undertaken for the following junctions;

- Ffordd Bleddyn / Cardiff Rd Signalised junction.
- Ffordd Bleddyn / Development Car park entrance.
- Ffordd Bleddyn / Development Main entrance mini roundabout.
- Moy Rd / Ffordd Bleddyn T Junction.

The capacity analysis is based on:

- Base data obtained from traffic surveys undertaken in June /July 2017 and Traffic signals data provided by RCTCBC was used to provide base calculations for the junction assessments.
- Future Year base data has been generated by factoring the 2017 base data by factors obtained from TEMPro V7.2 for design and opening year 2021 and 2031.
- Development trip calculation used data supplied by TfW on the expected number of staff and deliveries for the operation of a depot of the planned size for each of the assessed years.
- Development generated trips have been distributed evenly between areas to the north and south of the site.

The junction analysis results show that the site entrance, car park entrance and Moy Rd junction will operate well within desirable capacity up to 2031 with the development in place.

Results for the Ffordd Bleddyn/ Cardiff Rd Signalised junction indicated by 2031 the junction will operate just within theoretical capacity with or without the depot development in place.

## 15.2 Sustainable modes

Sustainable modes and active travel was considered in line with the requirements of the Active Travel (Wales) Act (2013). The proposals look to enhance access by bus, rail, walking and cycling by providing new and improved pedestrian and cycling access into the site and to public transport services.

A new Travel Plan will be provided for the site with the detailed planning application.

## 15.3 Conclusion

The Transport Assessment shows the site is ideally situated to provide a modern metro rolling stock storage and maintenance facility with good vehicular access via the road network and sustainable transport infrastructure with its proximity to a rail line and good links to the bus network.

It is concluded that there are no highway and transport reasons that the development should not proceed.

# Appendices

A.	Taffs Well Depot Location Plans	54
B.	Taffs Well Depot Indicative Drawings	55
C.	Traffic Flows	56
D.	Junction Analysis Results	57



# A. Taffs Well Depot Location

## A.1 Location Plan

## A.2 Red Line Plan





**Notes**

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**Key to symbols**

— Red Line Boundary

**Reference drawings**

367590-MMD-281-XX-DR-C-0002 - Ground Level Master Plan (Sheet 1 of 2)  
 367590-MMD-281-XX-DR-C-0003 - Upper Level Master Plan (Sheet 2 of 2)  
 367590-MMD-281-XX-DR-C-0004 - Red Line Boundary  
 367590-MMD-281-XX-DR-C-0005 - Parameters Plan  
 367590-MMD-281-XX-DR-C-0006 - Sections and Elevations (Sheet 1 of 2)  
 367590-MMD-281-XX-DR-C-0007 - Sections and Elevations (Sheet 2 of 2)  
 367590-MMD-281-XX-DR-C-0008 - Indicative Construction Phasing

Rev	Date	Drawn	Description	Ch'k'd	App'd
P3	09.03.18	RT	Hybrid Planning Application	RM	WW
P2	21.11.17	RT	RCTCBC First Review	WW	DF
P1	17.08.17	PR	Preliminary Issue	GL	WW

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**Title**

South Wales Metro - Task Order 028-I  
 Taffs Well Depot Outline Planning  
 Location Plan

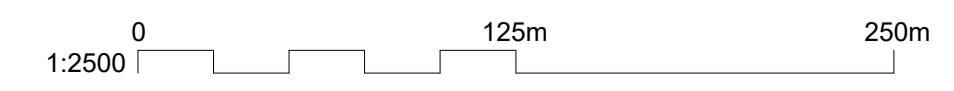
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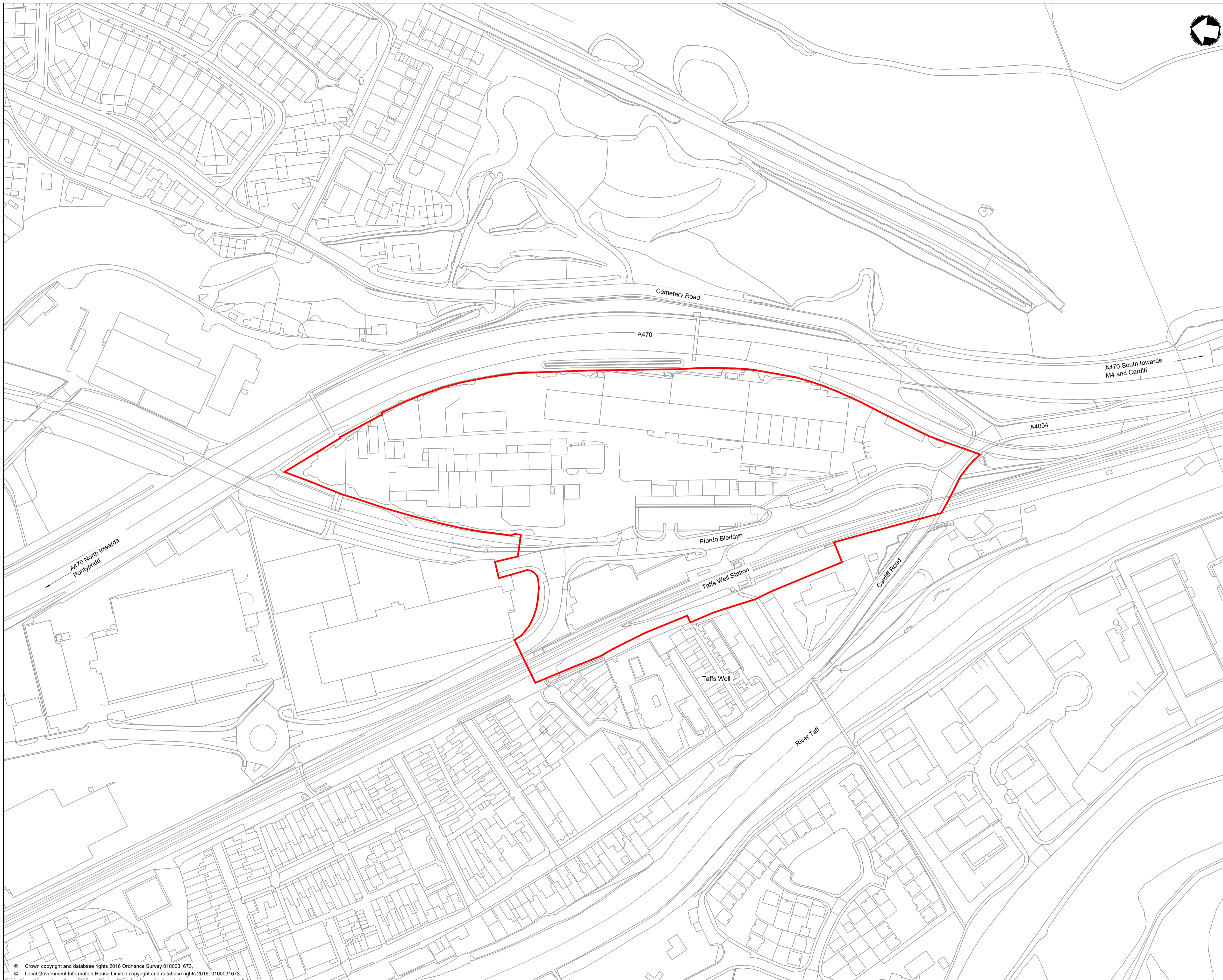
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Key to symbols

Red Line Boundary

- Reference drawings
- 367590-MMD-281-XX-DR-C-0001 - Location Plan
  - 367590-MMD-281-XX-DR-C-0002 - Ground Level Master Plan (Sheet 1 of 2)
  - 367590-MMD-281-XX-DR-C-0003 - Upper Level Master Plan (Sheet 2 of 2)
  - 367590-MMD-281-XX-DR-C-0005 - Parameters Plan
  - 367590-MMD-281-XX-DR-C-0006 - Sections and Elevations (Sheet 1 of 2)
  - 367590-MMD-281-XX-DR-C-0007 - Sections and Elevations (Sheet 2 of 2)
  - 367590-MMD-281-XX-DR-C-0008 - Indicative Construction Phasing

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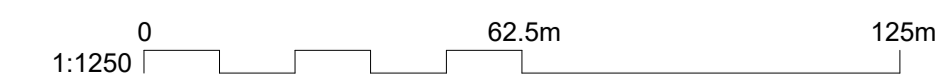
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Taffs Well Depot Outline Planning  
Red Line Boundary

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Drawing Number  
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## **B. Taffs Well Depot Indicative Drawings**

### **B.1 Master Plans**

### **B.2 Sections and Elevations**



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Key to symbols

	Highway to be constructed		New track
	Footpath/footbridge to be constructed		Existing track
	Cycle Storage		Existing platform
	Verge/landscaping		Cycle lane
	New building		Track Numbering
	New platform		
	Platform to be removed		

- Reference drawings
- 367590-MMD-281-XX-DR-C-0001 - Location Plan
  - 367590-MMD-281-XX-DR-C-0003 - Upper Level Master Plan (Sheet 2 of 2)
  - 367590-MMD-281-XX-DR-C-0004 - Red Line Boundary
  - 367590-MMD-281-XX-DR-C-0005 - Parameters Plan
  - 367590-MMD-281-XX-DR-C-0006 - Sections and Elevations (Sheet 1 of 2)
  - 367590-MMD-281-XX-DR-C-0007 - Sections and Elevations (Sheet 2 of 2)
  - 367590-MMD-281-XX-DR-C-0008 - Indicative Construction Phasing

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P4	09.03.18	RT	Hybrid Planning Application	RM	WW
P3	21.11.17	RT	RCTCBC First Review	WW	DF
P2	20.10.17	RT	Preliminary Issue	GL	WW
P1	03.08.17	PR	Preliminary Issue	GL	WW

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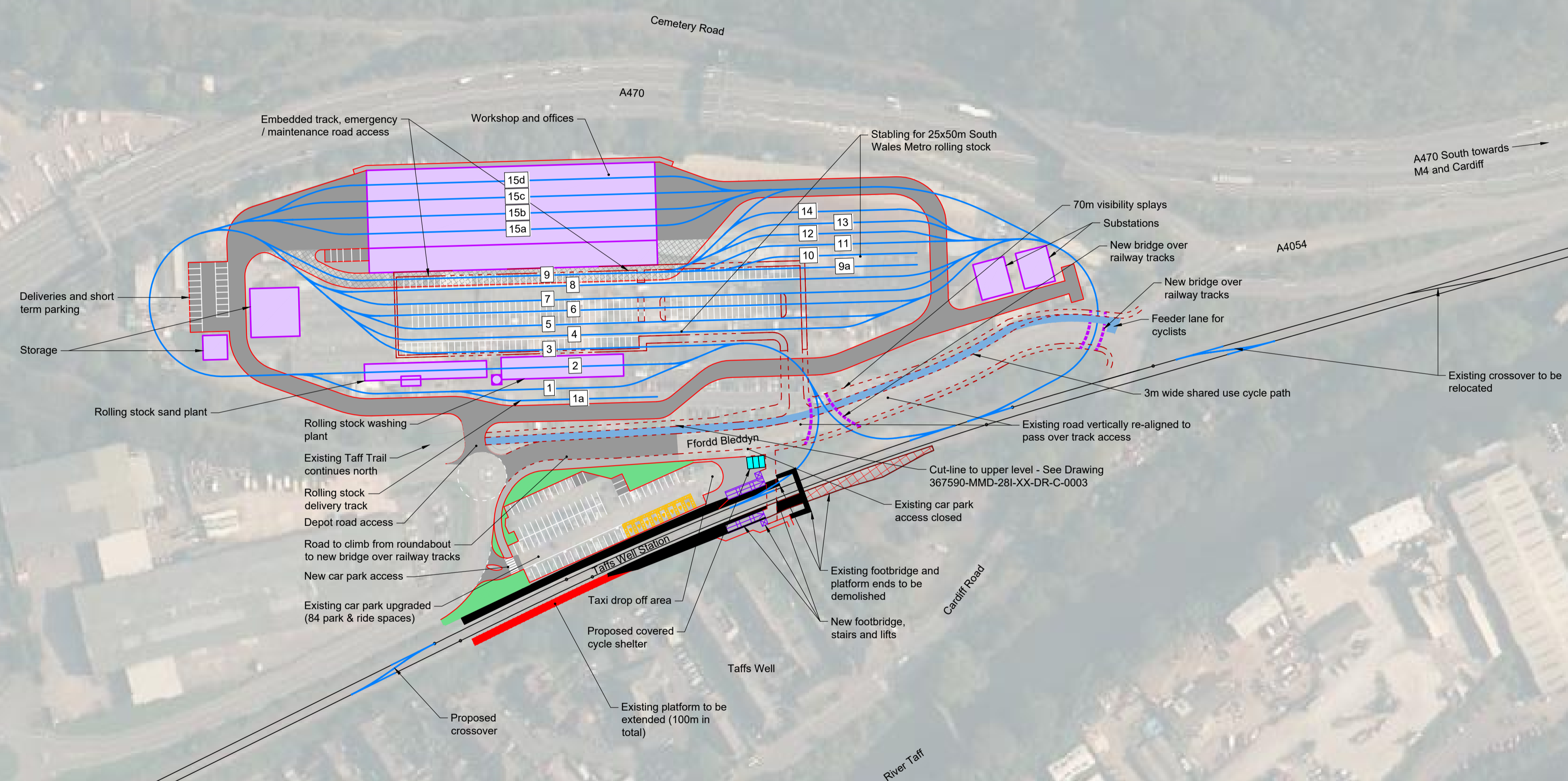
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Ground Level Master Plan  
(Sheet 1 of 2)

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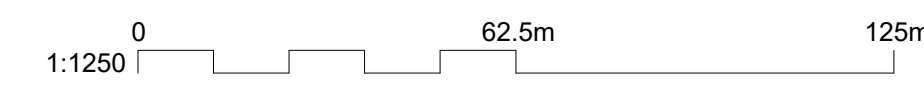


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1a	58
2	142
3	119
4	175
5	184
6	213
7	208
8	224
9	121
9a	78
10	56
11	67
12	53
13	54
14	50
15a	130
15b	158
15c	158
15d	129

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Key to symbols

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	Footpath/footbridge to be constructed		Existing track
	Cycle Storage		Existing platform
	Verge/landscaping		Cycle Path
	New building		
	New platform		
	Platform to be removed		

- Reference drawings
- 367590-MMD-281-XX-DR-C-0001 - Location Plan
  - 367590-MMD-281-XX-DR-C-0002 - Ground Level Master Plan (Sheet 1 of 2)
  - 367590-MMD-281-XX-DR-C-0004 - Red Line Boundary
  - 367590-MMD-281-XX-DR-C-0005 - Parameters Plan
  - 367590-MMD-281-XX-DR-C-0006 - Sections and Elevations (Sheet 1 of 2)
  - 367590-MMD-281-XX-DR-C-0007 - Sections and Elevations (Sheet 2 of 2)
  - 367590-MMD-281-XX-DR-C-0008 - Indicative Construction Phasing

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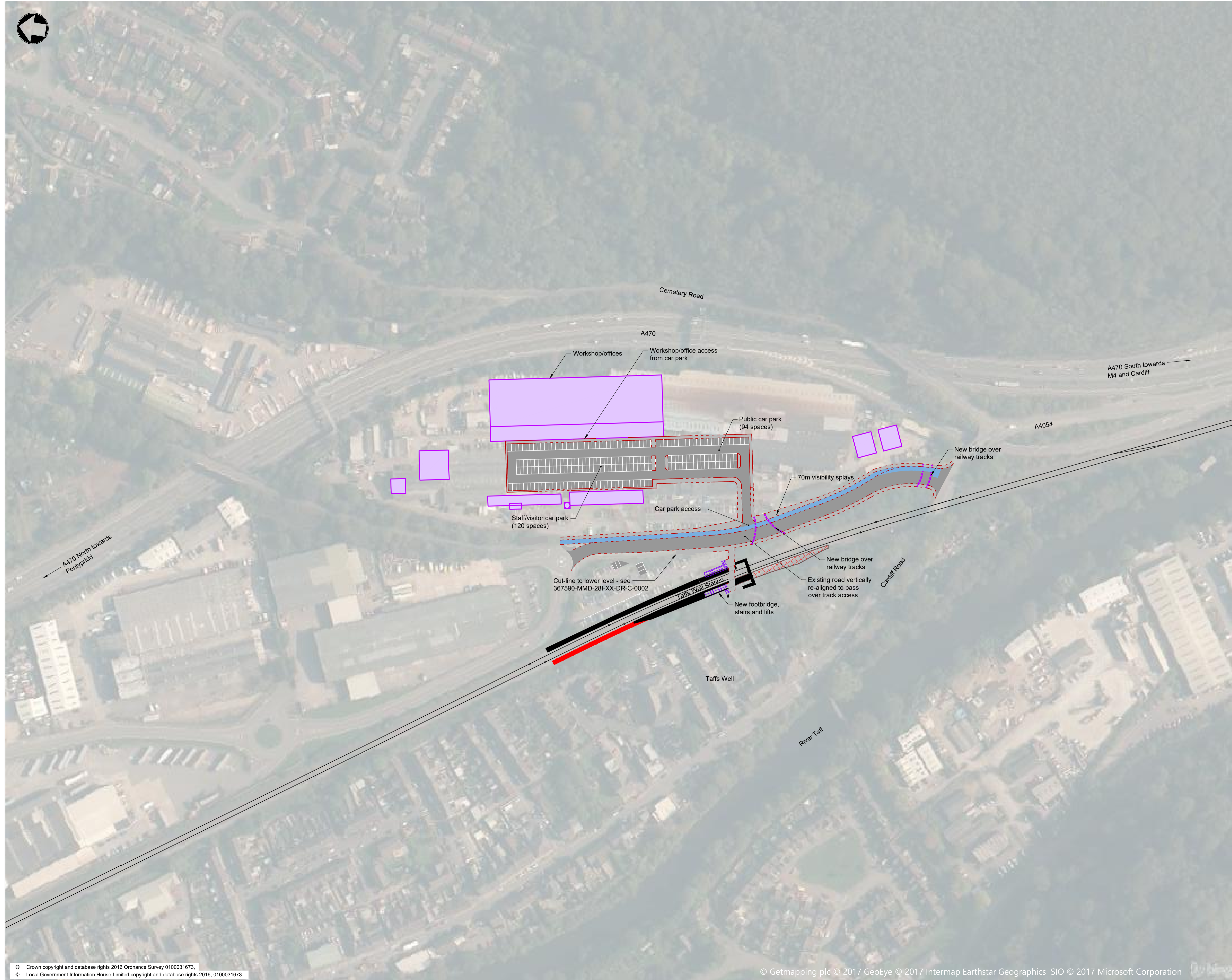
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**Upper Level Master Plan**  
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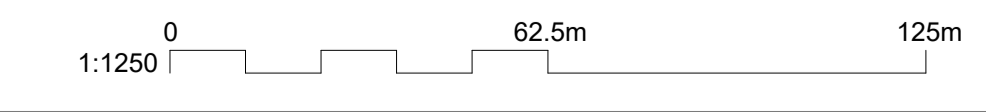
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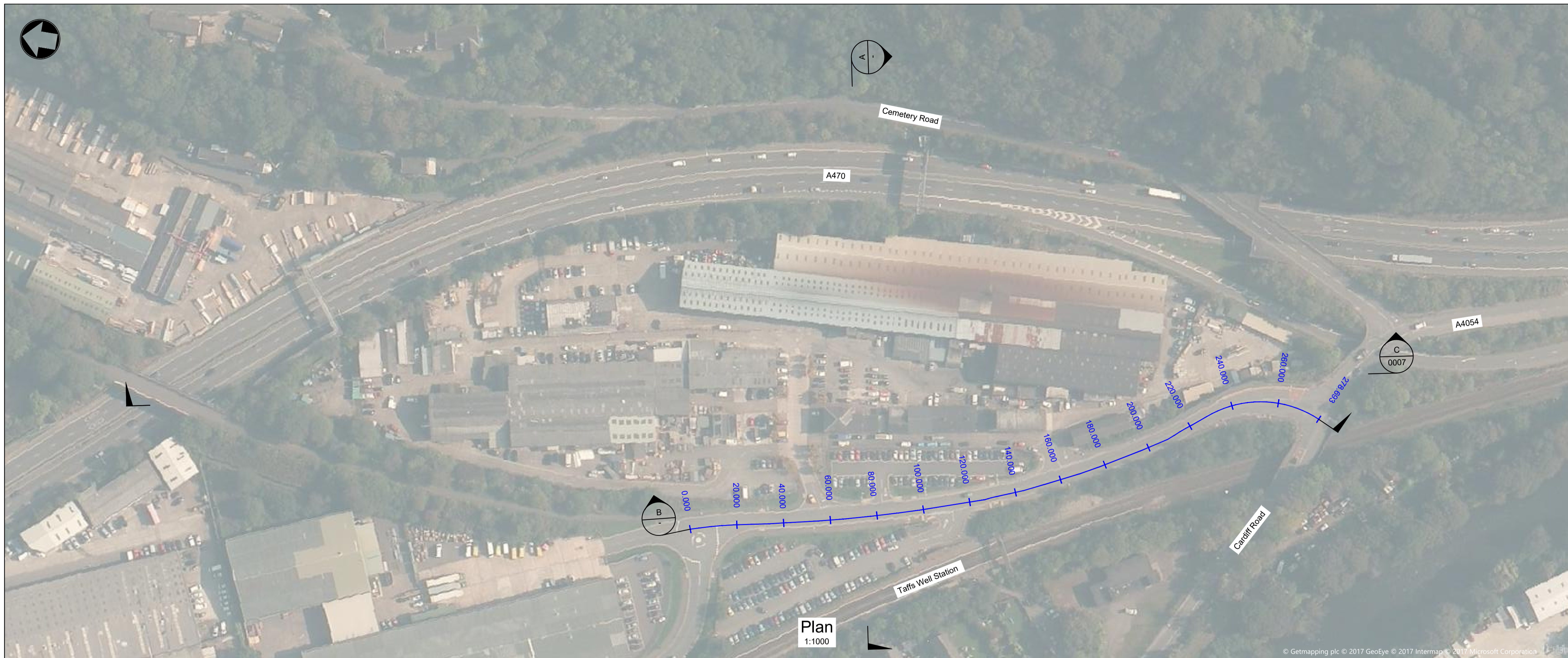
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**Key to Section**

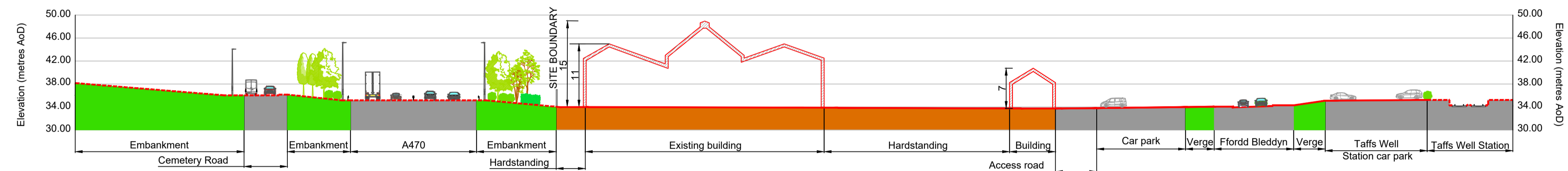
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- Indicative levels taken outside of survey boundary
- Area of hardstanding
- Area of highway/footway
- Verge/Embankments

**Key to Long Section**

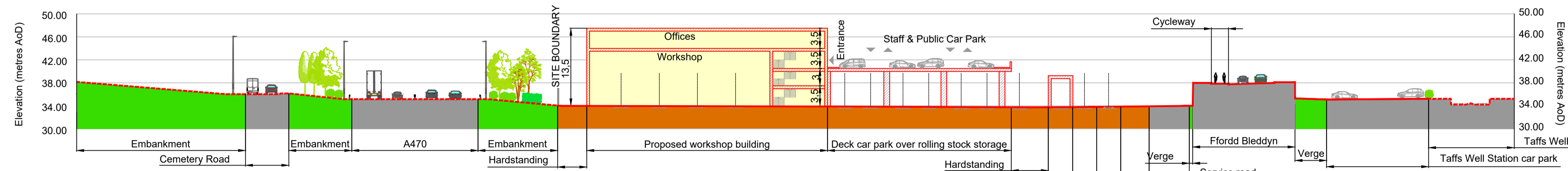
- Existing levels
- Proposed levels
- Proposed bridge for rolling stock access to depot

**Reference drawings**

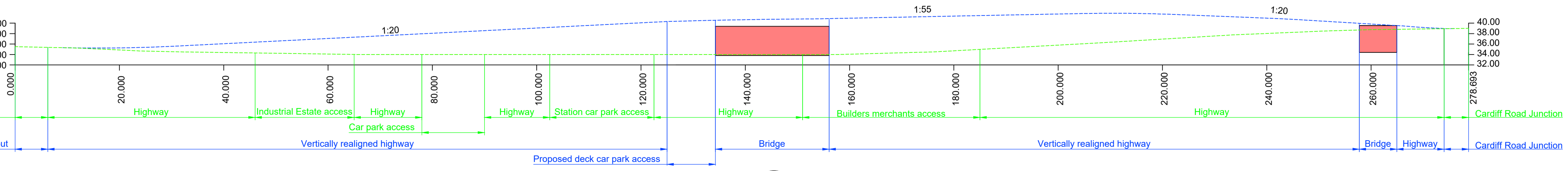
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 367590-MMD-281-XX-DR-C-0003 - Upper Level Master Plan (Sheet 2 of 2)  
 367590-MMD-281-XX-DR-C-0004 - Red Line Boundary  
 367590-MMD-281-XX-DR-C-0005 - Parameters Plan  
 367590-MMD-281-XX-DR-C-0007 - Sections and Elevations (Sheet 2 of 2)  
 367590-MMD-281-XX-DR-C-0008 - Indicative Construction Phasing



Existing Layout - Section A  
1:500



Proposed Layout - Section A  
1:500



Ffordd Bleddyn Long Section B  
1:500

Rev	Date	Drawn	Description	Ch'k'd	App'd
P3	09.03.18	RT	Hybrid Planning Application	RM	WW
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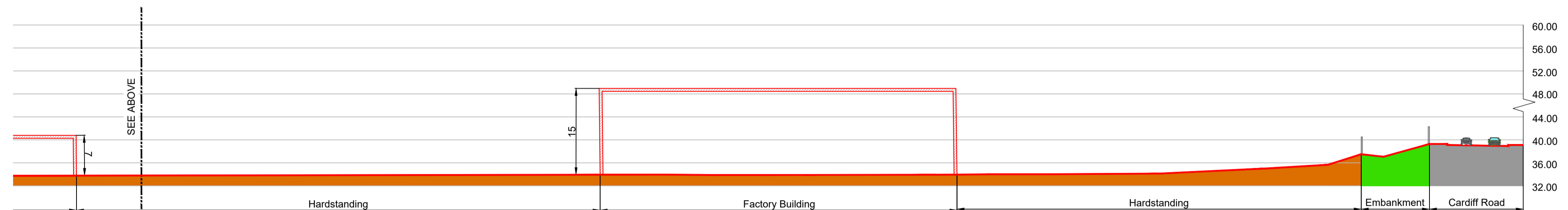
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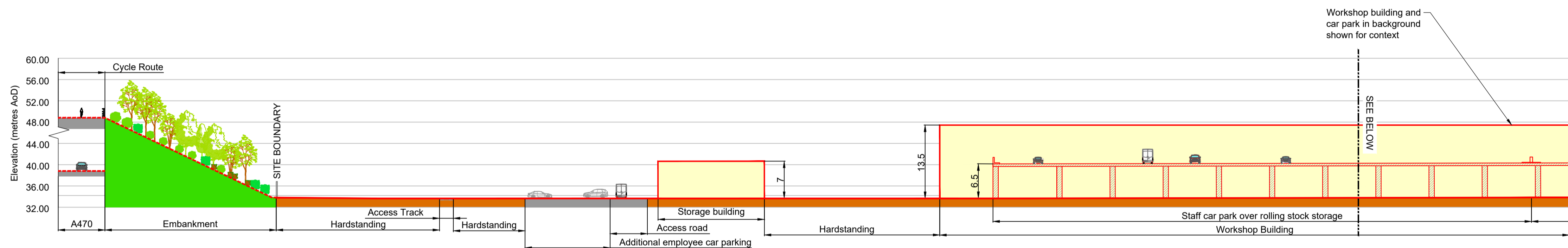




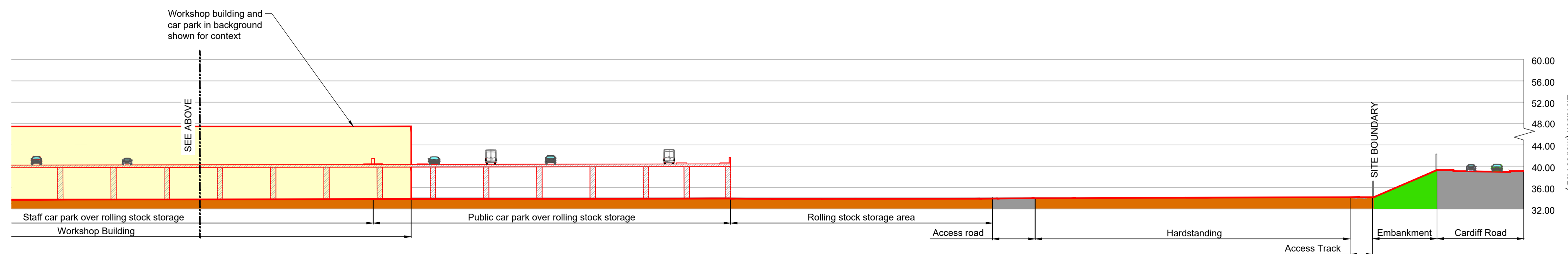
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1:500 0006



Existing Layout - Section (South) C  
1:500 0006



Proposed Layout - Section (North) C  
1:500 0006



Proposed Layout - Section (South) C  
1:500 0006

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Key to symbols

Key to Section

- Levels taken within survey boundary
- Indicative levels taken outside of survey boundary
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- Area of highway/footway
- Verge/Embankments

Reference drawings

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- 367590-MMD-281-XX-DR-C-0005 - Parameters Plan
- 367590-MMD-281-XX-DR-C-0006 - Sections and Elevations (Sheet 1 of 2)
- 367590-MMD-281-XX-DR-C-0006 - Indicative Construction Phasing

Rev	Date	Drawn	Description	Ch'k'd	App'd
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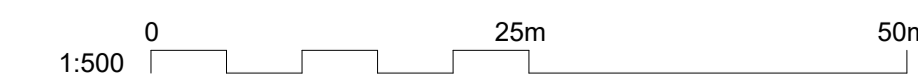
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Sections and Elevations  
(Sheet 2 of 2)

Designed	O. Mares	OM	Eng check	G. Last	GL
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Dwg check	D. Sansome	DS	Approved	W. Wootten	WW

Scale at A1	Status	Rev	Security
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## C. Traffic Flows

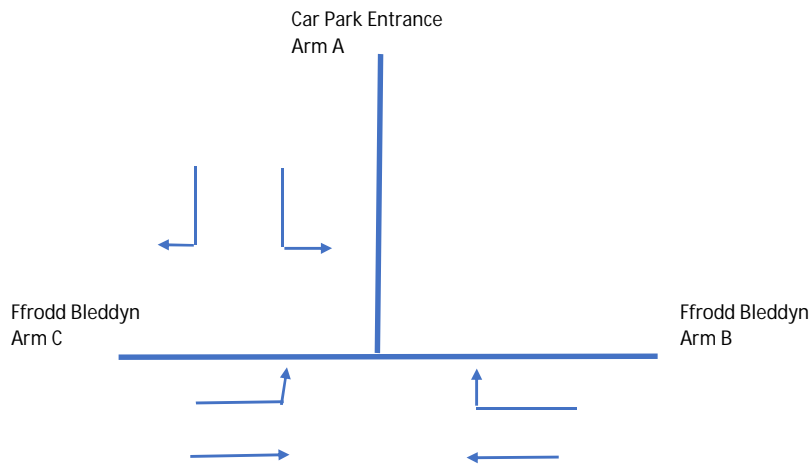
**C.1 Ffordd Bleddyn – Cardiff Road Signalised Junction**

**C.2 Ffordd Bleddyn - Depot Main Entrance Mini roundabout**

**C.3 Ffordd Bleddyn - Car Park**

**C.4 Moy Rd - Ffordd Bleddyn**

## Ffordd Bleddyn / Car Park Entrance - AM Base Traffic Flows



2017 AM Base Traffic Flows

AM	A	B	C
A	0	27	323
B	1	0	1
C	151	9	0

2017 AM Base HGV %

AM	A	B	C
A	0%	0%	11%
B	0%	0%	0%
C	4%	0%	0%

2021 AM Base Traffic Flows

AM	A	B	C
A	0	28	341
B	1	0	1
C	159	9	0

2021 AM Base HGV %

AM	A	B	C
A	0%	0%	11%
B	0%	0%	0%
C	4%	0%	0%

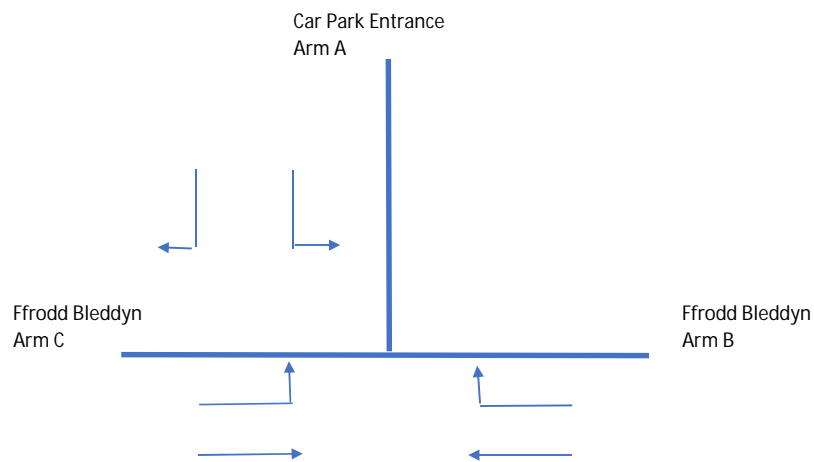
2031 AM Base Traffic Flows

AM	A	B	C
A	0	31	366
B	1	0	1
C	171	10	0

2031 AM Base HGV %

AM	A	B	C
A	0%	0%	11%
B	0%	0%	0%
C	4%	0%	0%

### Ffordd Bleddyn / Car Park Entrance - AM Base + Development Traffic Flows



2021 AM Base + Development Traffic Flows

AM	A	B	C
A	0	28	347
B	1	0	1
C	159	9	0

2021 AM Base + Development HGV %

AM	A	B	C
A	0%	0%	11%
B	0%	0%	0%
C	4%	0%	0%

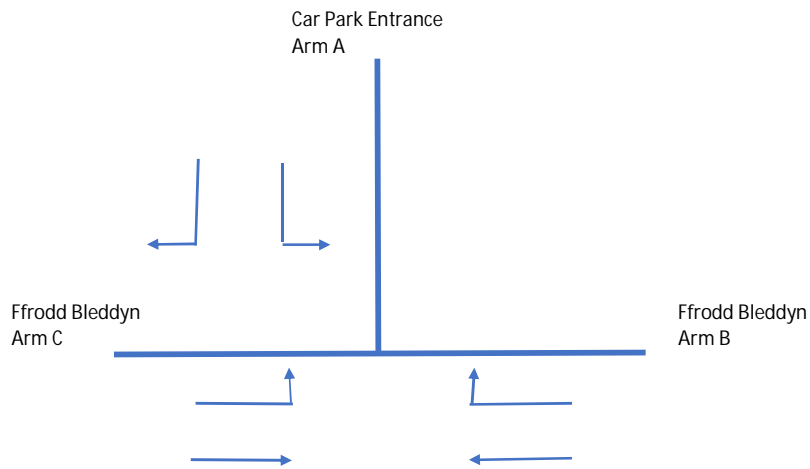
2031 AM Base + Development Traffic Flows

AM	A	B	C
A	0	31	372
B	1	0	1
C	171	10	0

2031 AM Base + Development HGV %

AM	A	B	C
A	0%	0%	11%
B	0%	0%	0%
C	4%	0%	0%

## Ffordd Bleddyn / Car Park Entrance - PM Base Traffic Flows



2017 PM Base Traffic Flows

PM	A	B	C
A	0	0	215
B	10	0	9
C	195	2	0

2017 PM Base HGV %

PM	A	B	C
A	0%	0%	3%
B	0%	0%	0%
C	13%	0%	0%

2021 PM Base Traffic Flows

PM	A	B	C
A	0	0	226
B	11	0	9
C	205	2	0

2021 PM Base HGV %

PM	A	B	C
A	0%	0%	3%
B	0%	0%	0%
C	13%	0%	0%

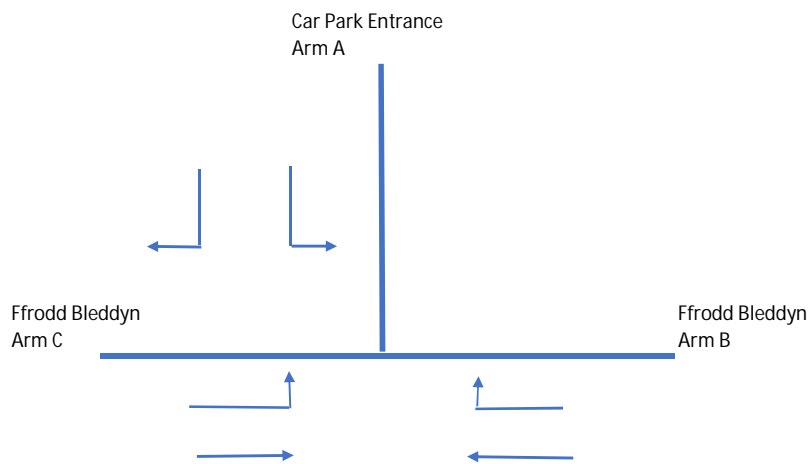
2031 PM Base Traffic Flows

PM	A	B	C
A	0	0	243
B	11	0	10
C	220	2	0

2031 PM Base HGV %

PM	A	B	C
A	0%	0%	3%
B	0%	0%	0%
C	13%	0%	0%

### Ffordd Bleddyn / Car Park Entrance - PM Base + Development Traffic Flows



2021 PM Base + Development Traffic Flows

PM	A	B	C
A	0	0	227
B	11	0	9
C	209	2	0

2021 PM Base + Development HGV %

PM	A	B	C
A	0%	0%	3%
B	0%	0%	0%
C	13%	0%	0%

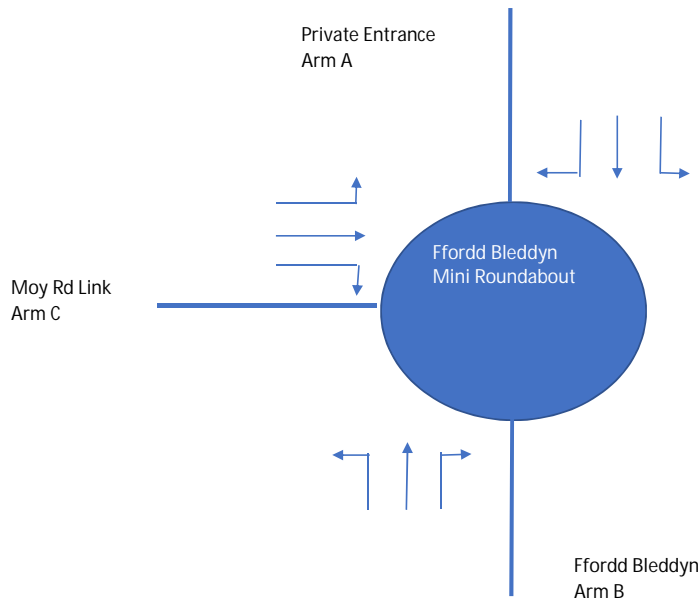
2031 PM Base + Development Traffic Flows

PM	A	B	C
A	0	0	244
B	11	0	10
C	224	2	0

2031 PM Base + Development HGV %

PM	A	B	C
A	0%	0%	3%
B	0%	0%	0%
C	13%	0%	0%

### Ffordd Bleddyn Mini Roundabout - AM Base Traffic Flows



2017 AM Base Flows

AM	A	B	C	D
A	0	17	5	0
B	6	0	126	0
C	15	312	0	0
D	0	0	0	0

2017 AM Base HGV %

AM	A	B	C	D
A	0%	6%	6%	0%
B	3%	0%	5%	0%
C	3%	6%	0%	0%
D	0%	0%	0%	0%

2021 AM Base Flows

AM	A	B	C	D
A	0	18	5	0
B	6	0	133	0
C	16	328	0	0
D	0	0	0	0

2021 AM Base HGV %

AM	A	B	C	D
A	0%	6%	6%	0%
B	3%	0%	5%	0%
C	3%	6%	0%	0%
D	0%	0%	0%	0%

2031 AM Base Flows

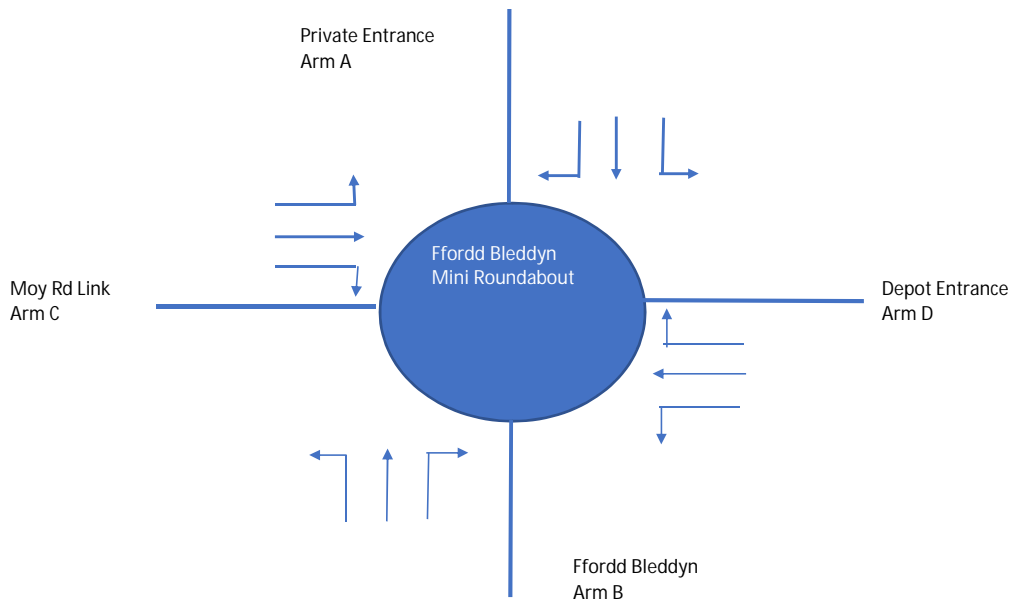
AM	A	B	C	D
A	0	19	6	0
B	7	0	143	0
C	17	353	0	0
D	0	0	0	0

2031 AM Base HGV %

AM	A	B	C	D
A	0%	6%	6%	0%
B	3%	0%	5%	0%
C	3%	6%	0%	0%
D	0%	0%	0%	0%



### Ffordd Bleddyn Mini Roundabout - AM Base + Developments Traffic Flows



2021 AM Traffic Flows Base + Developments

AM	A	B	C	D
A	0	18	5	0
B	6	0	133	1
C	16	333	0	1
D	0	0	0	0

2021 AM - HGV % Base + Developments

AM	A	B	C	D
A	0%	6%	6%	0%
B	3%	0%	5%	1%
C	3%	6%	0%	1%
D	0%	1%	1%	0%

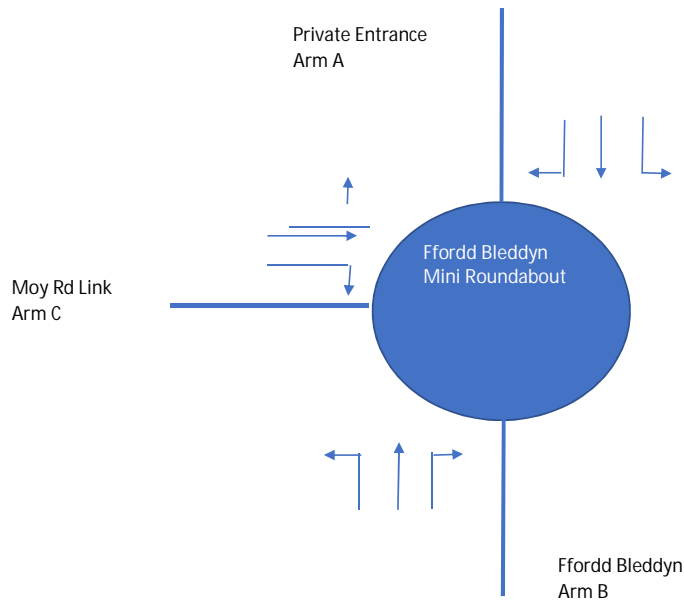
2031 AM Traffic Flows Base + Developments

AM	A	B	C	D
A	0	19	6	0
B	7	0	143	1
C	17	358	0	1
D	0	0	0	0

2031 AM - HGV % Base + Developments

AM	A	B	C	D
A	0%	6%	6%	0%
B	3%	0%	5%	1%
C	3%	6%	0%	1%
D	0%	1%	1%	0%

### Ffordd Bleddyn Mini Roundabout - PM Base Traffic Flows



2017 PM Base Flows

PM	A	B	C	D
A	0	10	11	0
B	11	0	220	0
C	8	156	0	0
D	0	0	0	0

2017 PM Base HGV %

PM	A	B	C	D
A	0%	3%	2%	0%
B	9%	0%	10%	0%
C	1%	1%	0%	0%
D	0%	0%	0%	0%

2021 PM Base Flows

PM	A	B	C	D
A	0	11	11	0
B	11	0	231	0
C	8	165	0	0
D	0	0	0	0

2021 PM Base HGV %

PM	A	B	C	D
A	0%	3%	2%	0%
B	9%	0%	10%	0%
C	1%	1%	0%	0%
D	0%	0%	0%	0%

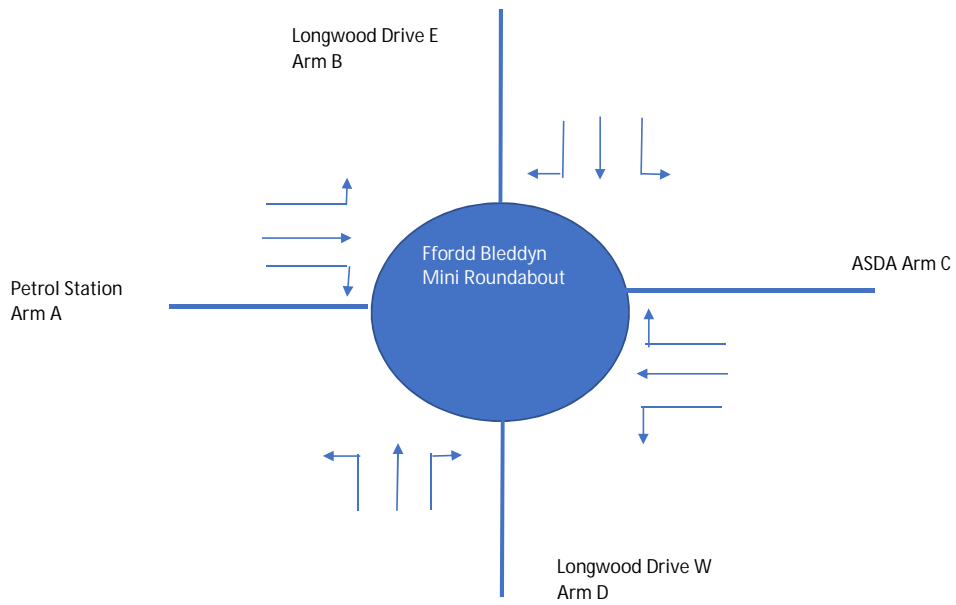
2031 PM Base Flows

PM	A	B	C	D
A	0	12	12	0
B	12	0	248	0
C	9	177	0	0
D	0	0	0	0

2031 PM Base HGV %

PM	A	B	C	D
A	0%	3%	2%	0%
B	9%	0%	10%	0%
C	1%	1%	0%	0%
D	0%	0%	0%	0%

### Ffordd Bleddyn Mini Roundabout - PM Base + Development Traffic Flows



2021 PM Traffic Flows Base + Developments

PM	A	B	C	D
A	0	11	11	0
B	11	0	234	1
C	8	165	0	1
D	0	0	1	0

2021 PM - HGV % Base + Developments

PM	A	B	C	D
A	0%	3%	2%	0%
B	9%	0%	10%	1%
C	1%	1%	0%	1%
D	0%	1%	1%	0%

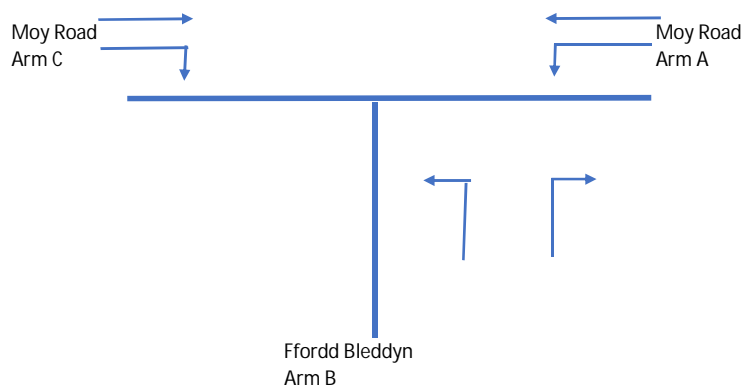
2031 PM Traffic Flows Base + Developments

PM	A	B	C	D
A	0	12	12	0
B	12	0	251	1
C	9	177	0	1
D	0	0	1	0

2031 PM - HGV % Base + Developments

PM	A	B	C	D
A	0%	3%	2%	0%
B	9%	0%	10%	1%
C	1%	1%	0%	1%
D	0%	1%	1%	0%

### Moy Road / Ffordd Bleddyn - AM Base Traffic Flows



2017 AM Base Traffic Flows

AM	A	B	C
A	0	76	51
B	8	0	94
C	26	251	0

2017 AM Base HGK %

AM	A	B	C
A	0%	1%	4%
B	0%	0%	8%
C	18%	7%	0%

2021 AM Base Traffic Flows

AM	A	B	C
A	0	80	54
B	8	0	99
C	27	264	0

2021 AM Base HGK %

AM	A	B	C
A	0%	1%	4%
B	0%	0%	8%
C	18%	7%	0%

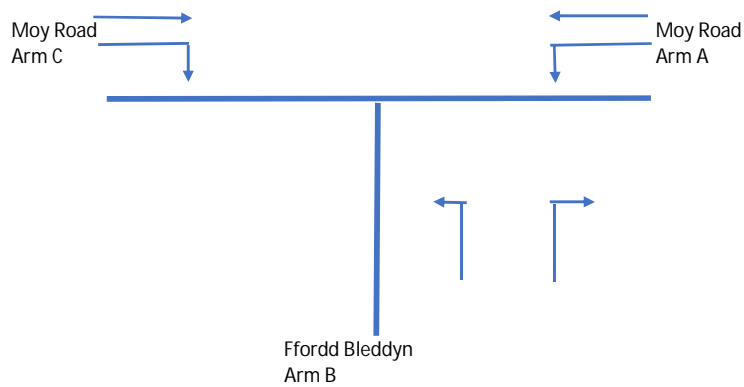
2031 AM Base Traffic Flows

AM	A	B	C
A	0	86	58
B	9	0	106
C	29	284	0

2031 AM Base HGK %

AM	A	B	C
A	0%	1%	4%
B	0%	0%	8%
C	18%	7%	0%

### Moy Road / Ffordd Bleddyn - AM Base + Development Traffic Flows



2021 AM Base + Development Traffic Flows

AM	A	B	C
A	0	80	54
B	8	0	99
C	27	271	0

2021 AM Base + Development HGV %

AM	A	B	C
A	0%	1%	4%
B	0%	0%	8%
C	18%	7%	0%

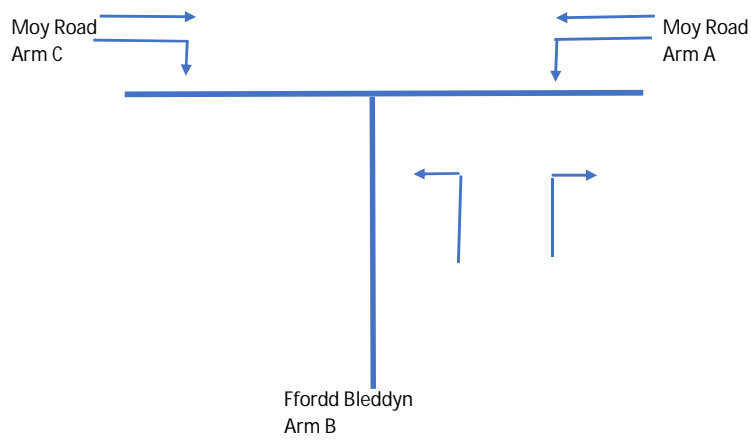
2031 AM Base + Development Traffic Flows

AM	A	B	C
A	0	86	58
B	9	0	106
C	29	290	0

2031 AM Base + Development HGV %

AM	A	B	C
A	0%	1%	4%
B	0%	8%	8%
C	18%	7%	0%

### Moy Road / Ffordd Bleddyn - PM Base Traffic Flows



2017 PM Base Traffic Flows

PM	A	B	C
A	0	36	47
B	72	0	152
C	57	129	0

2017 PM Base HGV %

PM	A	B	C
A	0%	0%	0%
B	1%	0%	5%
C	0%	2%	0%

2021 PM Base Traffic Flows

PM	A	B	C
A	0	37	49
B	76	0	160
C	60	136	0

2021 AM Base HGV %

PM	A	B	C
A	0%	0%	0%
B	1%	0%	5%
C	0%	2%	0%

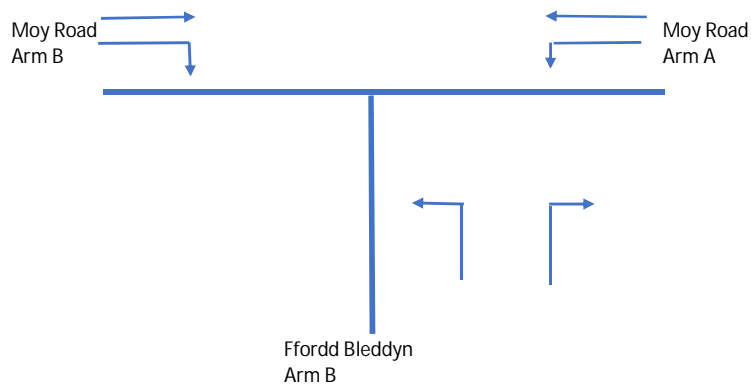
2031 PM Base Traffic Flows

PM	A	B	C
A	0	40	53
B	81	0	171
C	64	145	0

2031 AM Base HGV %

PM	A	B	C
A	0%	0%	0%
B	1%	0%	5%
C	0%	2%	0%

### Moy Road / Ffordd Bleddyn - PM Base + Development Traffic Flows



2021 PM Base + Development Traffic Flows

PM	A	B	C
A	0	37	49
B	76	0	164
C	60	137	0

2021 AM Base + Development HGV %

PM	A	B	C
A	0%	0%	0%
B	1%	0%	5%
C	0%	2%	0%

2031 PM Base + Development Traffic Flows

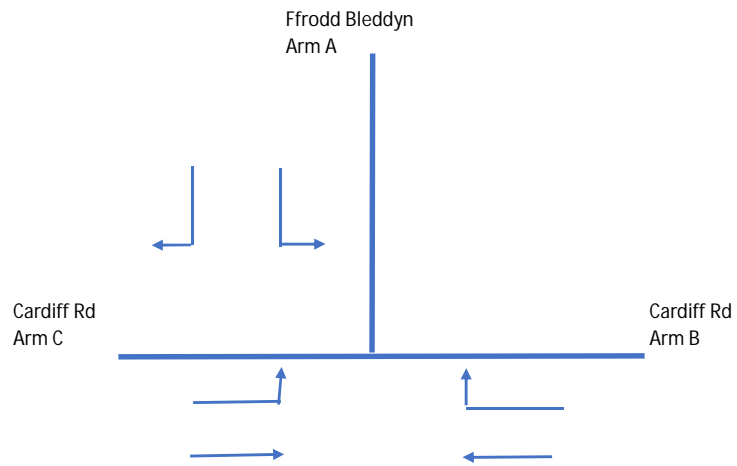
PM	A	B	C
A	0	40	53
B	81	0	175
C	64	146	0

2031 AM Base + Development HGV %

PM	A	B	C
A	0%	0%	0%
B	1%	0%	5%
C	0%	2%	0%



### Ffordd Bleddyn / Cardiff Rd Signalised Junction - AM Base Traffic Flows



2017 AM Base Traffic Flows

AM	A	B	C
A	0	317	8
B	172	0	236
C	9	417	0

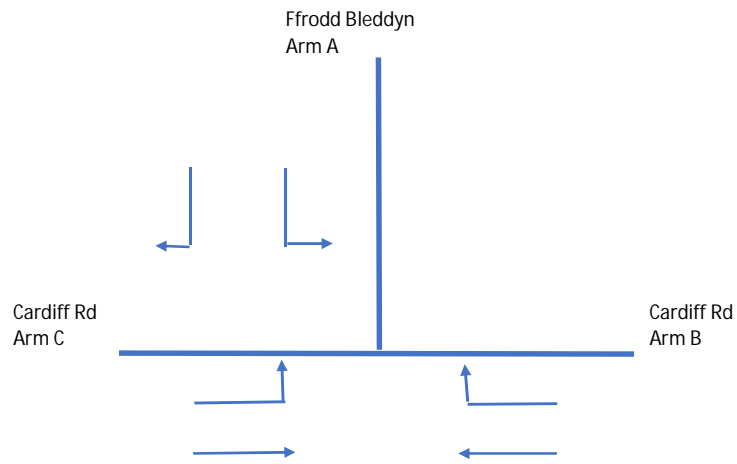
2021 AM Base Traffic Flows

AM	A	B	C
A	0	327	8
B	180	0	247
C	9	435	0

2031 AM Base Traffic Flows

AM	A	B	C
A	0	342	9
B	191	0	262
C	10	461	0

## Ffordd Bleddyn / Cardiff Rd Signalised Junction - AM Base + Development Traffic Flows



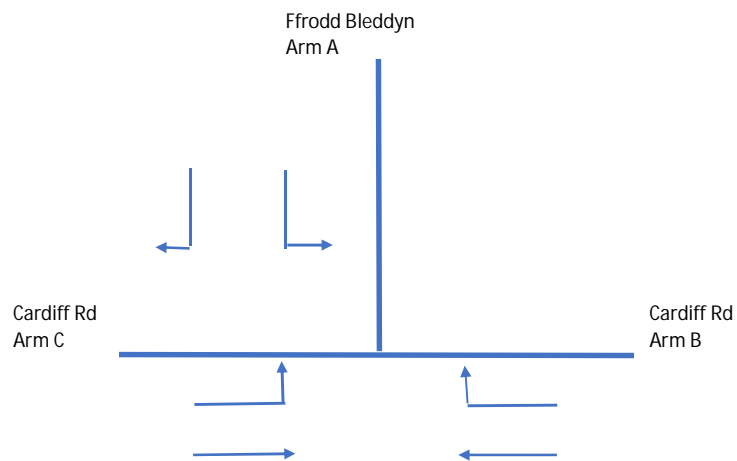
2021 AM Base + Development Traffic Flows

AM	A	B	C
A	0	327	8
B	191	0	247
C	14	435	0

2031 AM Base + Development Traffic Flows

AM	A	B	C
A	0	342	9
B	202	0	262
C	15	461	0

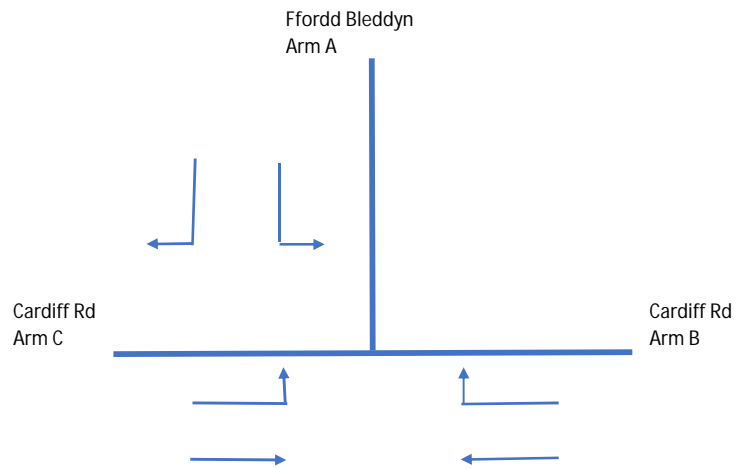
# Ffrodd Bleddyn / Cardiff Rd Signalised Junction - AM Development Traffic Flows



2021 and 2031 AM Base + Development Traffic Flows

AM	A	B	C
A	0	0	0
B	11	0	0
C	5	0	0

## Ffordd Bleddyn / Cardiff Rd Signalised Junction - PM Base Traffic Flows



2017 PM Base Traffic Flows

PM	A	B	C
A	0	242	10
B	203	0	289
C	14	228	0

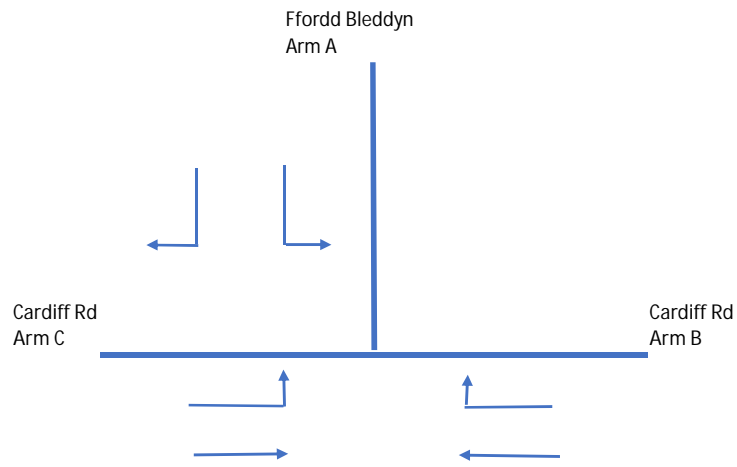
2021 PM Base Traffic Flows

PM	A	B	C
A	0	252	11
B	210	0	302
C	15	238	0

2031 PM Base Traffic Flows

PM	A	B	C
A	0	268	11
B	221	0	321
C	16	253	0

## Ffordd Bleddyn / Cardiff Rd Signalised Junction - PM Base + Development Traffic Flows



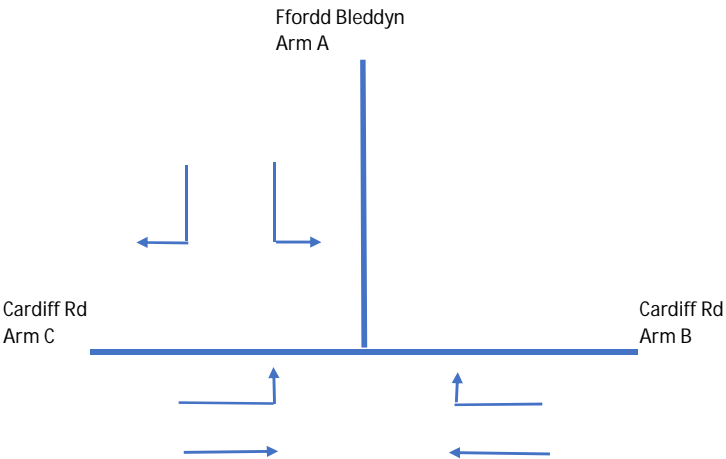
2021 PM Base + Development Traffic Flows

PM	A	B	C
A	0	258	14
B	211	0	302
C	15	238	0

2031 PM Base + Development Traffic Flows

PM	A	B	C
A	0	274	14
B	222	0	321
C	16	253	0

Ffordd Bleddyn / Cardiff Rd Signalised Junction - PM Development Traffic Flows



2021 and 2031 PM Base + Development Traffic Flows

PM	A	B	C
A	0	6	3
B	1	0	0
C	0	0	0

## **D. Junction Analysis Results**

**D.1 Ffordd Bleddyn - Cardiff Rd Signalised Junction**

**D.2 Ffordd Bleddyn - Depot Main Entrance**

**D.3 Ffordd Bleddyn - Car Park**

**D.4 Moy Rd - Ffordd Bleddyn**

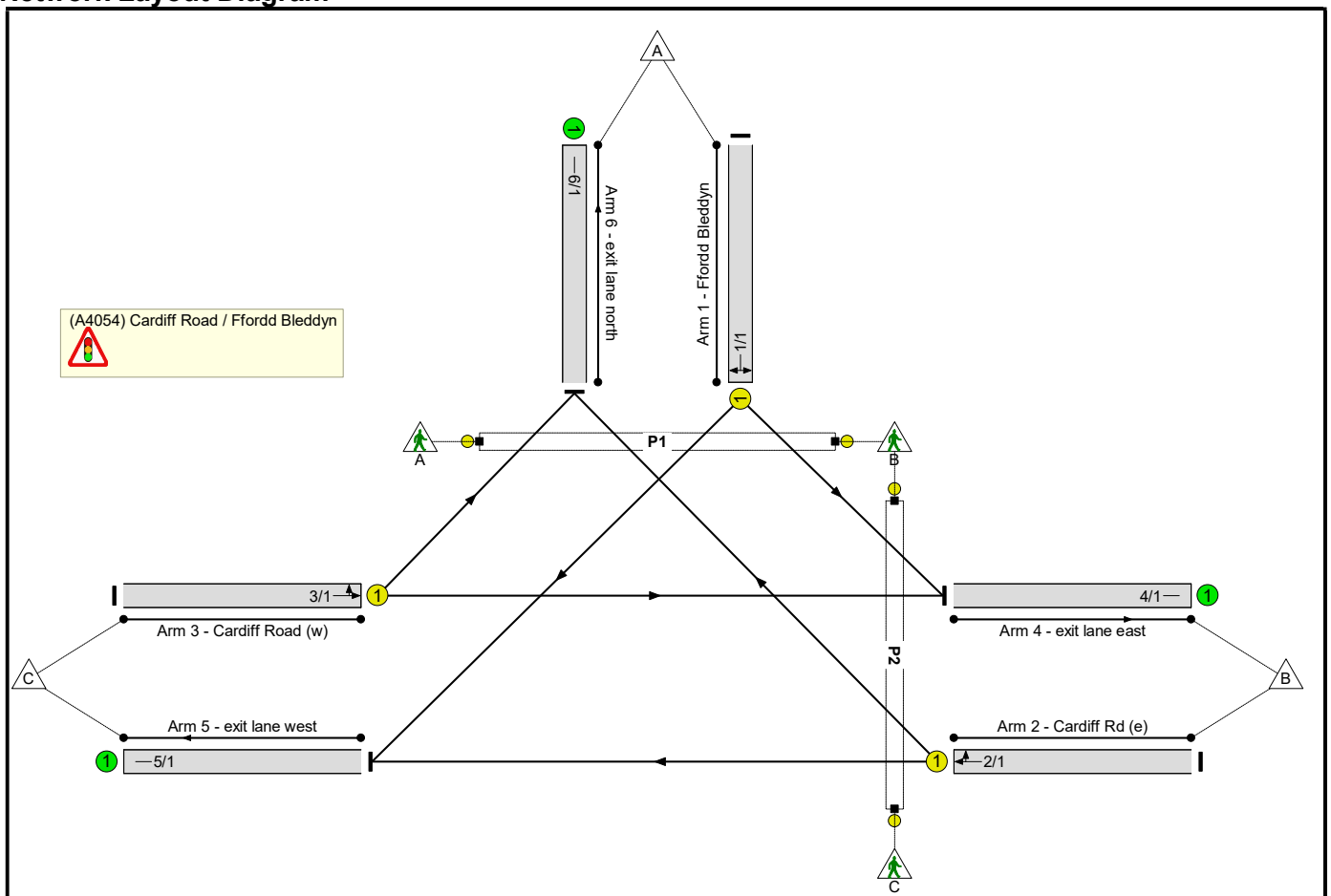


Full Input Data And Results  
**Full Input Data And Results**

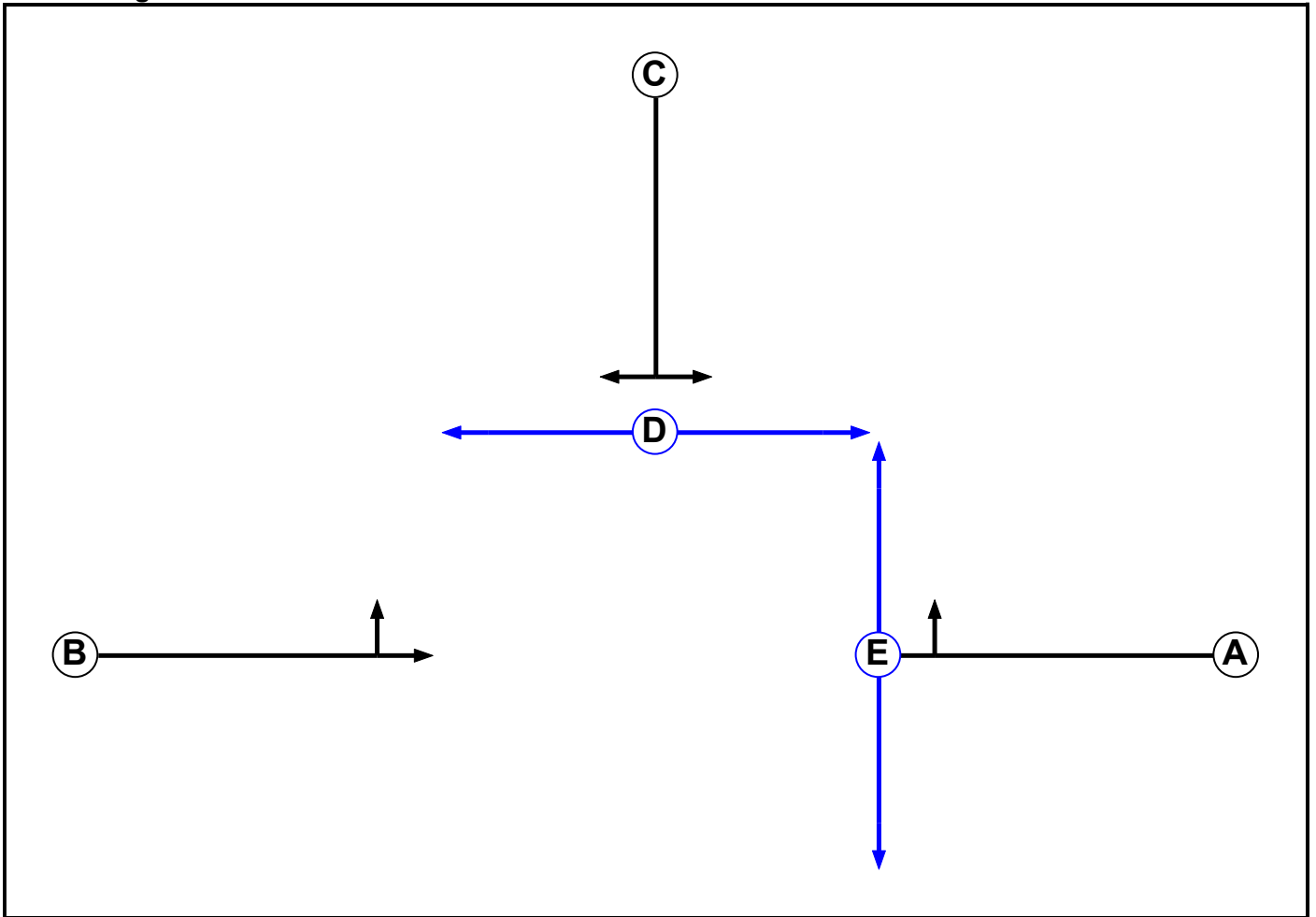
**User and Project Details**

<b>Project:</b>	
<b>Title:</b>	
<b>Location:</b>	
<b>Additional detail:</b>	
<b>File name:</b>	Cardiff Road_Ffordd Bleddyn.lsg3x
<b>Author:</b>	
<b>Company:</b>	
<b>Address:</b>	

**Network Layout Diagram**



### Phase Diagram



### Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		7	7
B	Traffic		7	7
C	Traffic		7	7
D	Pedestrian		6	6
E	Pedestrian		6	6

## Full Input Data And Results

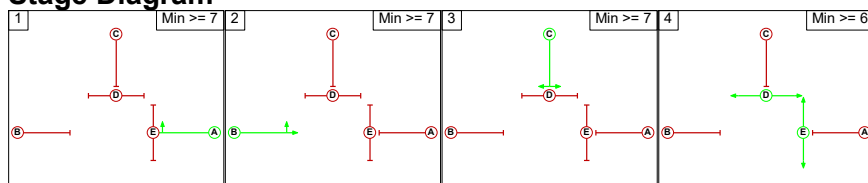
### Phase Intergrens Matrix

		Starting Phase				
		A	B	C	D	E
Terminating Phase	A					
	B	5				
	C	5	5			
	D	2	2	2		
	E	0	0	0	-	

### Phases in Stage

Stage No.	Phases in Stage
1	A
2	B
3	C
4	D E

### Stage Diagram



### Phase Delays

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

### Prohibited Stage Change

		To Stage			
		1	2	3	4
From Stage	1				
	2	5			
	3	5	5		
	4	2	2	2	

Full Input Data And Results

**Give-Way Lane Input Data**

**Junction: (A4054) Cardiff Road / Ffordd Bleddyn**

There are no Opposed Lanes in this Junction

Full Input Data And Results

**Lane Input Data**

Junction: (A4054) Cardiff Road / Ffordd Bleddyn												
Lane	Lane Type	Phases	Start Disp.	End Disp.	Physical Length (PCU)	Sat Flow Type	Def User Saturation Flow (PCU/Hr)	Lane Width (m)	Gradient	Nearside Lane	Turns	Turning Radius (m)
1/1 (Ffordd Bleddyn)	U	C	2	3	60.0	Geom	-	3.50	0.00	Y	Arm 4 Left	14.00
											Arm 5 Right	13.00
2/1 (Cardiff Rd (e))	U	A	2	3	60.0	Geom	-	3.50	0.00	Y	Arm 5 Ahead	Inf
											Arm 6 Right	13.00
3/1 (Cardiff Road (w))	U	B	2	3	60.0	Geom	-	3.50	0.00	Y	Arm 4 Ahead	Inf
											Arm 6 Left	14.00
4/1 (exit lane east)	U		2	3	60.0	Inf	-	-	-	-	-	-
5/1 (exit lane west)	U		2	3	60.0	Inf	-	-	-	-	-	-
6/1 (exit lane north)	U		2	3	60.0	Inf	-	-	-	-	-	-

**Traffic Flow Groups**

Flow Group	Start Time	End Time	Duration	Formula
1: 'Base AM'	07:30	08:30	01:00	
2: 'Base PM'	16:30	17:30	01:00	
3: '2021 AM (no dev)'	07:30	08:30	01:00	
4: '2021 PM (no dev)'	16:30	17:30	01:00	
7: '2031 AM (no dev)'	07:30	08:30	01:00	
8: '2031 PM (no dev)'	16:30	17:30	01:00	
9: '2021 AM (with dev)'	07:30	08:30	01:00	F3 + F5
10: '2021 PM (with dev)'	16:30	17:30	01:00	F4 + F6
11: '2031 AM (with dev)'	07:30	08:30	01:00	F7 + F5
12: '2031 PM (with dev)'	16:30	17:30	01:00	F8 + F6

**Scenario 1: 'Base AM'** (FG1: 'Base AM', Plan 1: 'Network Control Plan 1')

**Traffic Flows, Desired**

**Desired Flow :**

		Destination			
		A	B	C	Tot.
Origin	A	0	317	8	325
	B	172	0	236	408
	C	9	417	0	426
	Tot.	181	734	244	1159

**Traffic Lane Flows**

Lane	Scenario 1: Base AM
<b>Junction: (A4054) Cardiff Road / Ffordd Bleddyn</b>	
1/1	325
2/1	408
3/1	426
4/1	734
5/1	244
6/1	181

**Lane Saturation Flows**

<b>Junction: (A4054) Cardiff Road / Ffordd Bleddyn</b>								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (Ffordd Bleddyn)	3.50	0.00	Y	Arm 4 Left	14.00	97.5 %	1775	1775
				Arm 5 Right	13.00	2.5 %		
2/1 (Cardiff Rd (e))	3.50	0.00	Y	Arm 5 Ahead	Inf	57.8 %	1874	1874
				Arm 6 Right	13.00	42.2 %		
3/1 (Cardiff Road (w))	3.50	0.00	Y	Arm 4 Ahead	Inf	97.9 %	1961	1961
				Arm 6 Left	14.00	2.1 %		
4/1 (exit lane east Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (exit lane west Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (exit lane north Lane 1)	Infinite Saturation Flow						Inf	Inf

Full Input Data And Results

Scenario 2: 'Base PM' (FG2: 'Base PM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	242	10	252
	B	203	0	289	492
	C	14	228	0	242
	Tot.	217	470	299	986

Traffic Lane Flows

Lane	Scenario 2: Base PM
<b>Junction: (A4054) Cardiff Road / Ffordd Bleddyn</b>	
1/1	252
2/1	492
3/1	242
4/1	470
5/1	299
6/1	217

Lane Saturation Flows

<b>Junction: (A4054) Cardiff Road / Ffordd Bleddyn</b>								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (Ffordd Bleddyn)	3.50	0.00	Y	Arm 4 Left	14.00	96.0 %	1774	1774
				Arm 5 Right	13.00	4.0 %		
2/1 (Cardiff Rd (e))	3.50	0.00	Y	Arm 5 Ahead	Inf	58.7 %	1876	1876
				Arm 6 Right	13.00	41.3 %		
3/1 (Cardiff Road (w))	3.50	0.00	Y	Arm 4 Ahead	Inf	94.2 %	1953	1953
				Arm 6 Left	14.00	5.8 %		
4/1 (exit lane east Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (exit lane west Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (exit lane north Lane 1)	Infinite Saturation Flow						Inf	Inf

Full Input Data And Results

Scenario 3: '2021 AM (no dev)' (FG3: '2021 AM (no dev)', Plan 1: 'Network Control Plan 1')

**Traffic Flows, Desired**

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	327	8	335
	B	180	0	247	427
	C	9	435	0	444
	Tot.	189	762	255	1206

**Traffic Lane Flows**

Lane	Scenario 3: 2021 AM (no dev)
<b>Junction: (A4054) Cardiff Road / Ffordd Bleddyn</b>	
1/1	335
2/1	427
3/1	444
4/1	762
5/1	255
6/1	189

**Lane Saturation Flows**

<b>Junction: (A4054) Cardiff Road / Ffordd Bleddyn</b>								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (Ffordd Bleddyn)	3.50	0.00	Y	Arm 4 Left	14.00	97.6 %	1775	1775
				Arm 5 Right	13.00	2.4 %		
2/1 (Cardiff Rd (e))	3.50	0.00	Y	Arm 5 Ahead	Inf	57.8 %	1874	1874
				Arm 6 Right	13.00	42.2 %		
3/1 (Cardiff Road (w))	3.50	0.00	Y	Arm 4 Ahead	Inf	98.0 %	1961	1961
				Arm 6 Left	14.00	2.0 %		
4/1 (exit lane east Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (exit lane west Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (exit lane north Lane 1)	Infinite Saturation Flow						Inf	Inf



Full Input Data And Results

Scenario 4: '2021 PM (no dev)' (FG4: '2021 PM (no dev)', Plan 1: 'Network Control Plan 1')

**Traffic Flows, Desired**

Desired Flow :

	Destination				
	A	B	C	Tot.	
Origin	A	0	252	11	263
	B	210	0	302	512
	C	15	238	0	253
	Tot.	225	490	313	1028

**Traffic Lane Flows**

Lane	Scenario 4: 2021 PM (no dev)
<b>Junction: (A4054) Cardiff Road / Ffordd Bleddyn</b>	
1/1	263
2/1	512
3/1	253
4/1	490
5/1	313
6/1	225

**Lane Saturation Flows**

<b>Junction: (A4054) Cardiff Road / Ffordd Bleddyn</b>								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (Ffordd Bleddyn)	3.50	0.00	Y	Arm 4 Left	14.00	95.8 %	1774	1774
				Arm 5 Right	13.00	4.2 %		
2/1 (Cardiff Rd (e))	3.50	0.00	Y	Arm 5 Ahead	Inf	59.0 %	1876	1876
				Arm 6 Right	13.00	41.0 %		
3/1 (Cardiff Road (w))	3.50	0.00	Y	Arm 4 Ahead	Inf	94.1 %	1953	1953
				Arm 6 Left	14.00	5.9 %		
4/1 (exit lane east Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (exit lane west Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (exit lane north Lane 1)	Infinite Saturation Flow						Inf	Inf

Full Input Data And Results

Scenario 5: '2021 AM (with dev)' (FG9: '2021 AM (with dev)', Plan 1: 'Network Control Plan 1')

**Traffic Flows, Desired**

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	327	8	335
	B	191	0	247	438
	C	14	435	0	449
	Tot.	205	762	255	1222

**Traffic Lane Flows**

Lane	Scenario 5: 2021 AM (with dev)
<b>Junction: (A4054) Cardiff Road / Ffordd Bleddyn</b>	
1/1	335
2/1	438
3/1	449
4/1	762
5/1	255
6/1	205

**Lane Saturation Flows**

<b>Junction: (A4054) Cardiff Road / Ffordd Bleddyn</b>								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (Ffordd Bleddyn)	3.50	0.00	Y	Arm 4 Left	14.00	97.6 %	1775	1775
				Arm 5 Right	13.00	2.4 %		
2/1 (Cardiff Rd (e))	3.50	0.00	Y	Arm 5 Ahead	Inf	56.4 %	1871	1871
				Arm 6 Right	13.00	43.6 %		
3/1 (Cardiff Road (w))	3.50	0.00	Y	Arm 4 Ahead	Inf	96.9 %	1958	1958
				Arm 6 Left	14.00	3.1 %		
4/1 (exit lane east Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (exit lane west Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (exit lane north Lane 1)	Infinite Saturation Flow						Inf	Inf

Full Input Data And Results

Scenario 6: '2021 PM (with dev)' (FG10: '2021 PM (with dev)', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	258	14	272
	B	211	0	302	513
	C	15	238	0	253
	Tot.	226	496	316	1038

Traffic Lane Flows

Lane	Scenario 6: 2021 PM (with dev)
<b>Junction: (A4054) Cardiff Road / Ffordd Bleddyn</b>	
1/1	272
2/1	513
3/1	253
4/1	496
5/1	316
6/1	226

Lane Saturation Flows

<b>Junction: (A4054) Cardiff Road / Ffordd Bleddyn</b>								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (Ffordd Bleddyn)	3.50	0.00	Y	Arm 4 Left	14.00	94.9 %	1774	1774
				Arm 5 Right	13.00	5.1 %		
2/1 (Cardiff Rd (e))	3.50	0.00	Y	Arm 5 Ahead	Inf	58.9 %	1876	1876
				Arm 6 Right	13.00	41.1 %		
3/1 (Cardiff Road (w))	3.50	0.00	Y	Arm 4 Ahead	Inf	94.1 %	1953	1953
				Arm 6 Left	14.00	5.9 %		
4/1 (exit lane east Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (exit lane west Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (exit lane north Lane 1)	Infinite Saturation Flow						Inf	Inf

Full Input Data And Results

Scenario 7: '2031 AM (no dev)' (FG7: '2031 AM (no dev)', Plan 1: 'Network Control Plan 1')

**Traffic Flows, Desired**

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	342	9	351
	B	191	0	262	453
	C	10	461	0	471
	Tot.	201	803	271	1275

**Traffic Lane Flows**

Lane	Scenario 7: 2031 AM (no dev)
<b>Junction: (A4054) Cardiff Road / Ffordd Bleddyn</b>	
1/1	351
2/1	453
3/1	471
4/1	803
5/1	271
6/1	201

**Lane Saturation Flows**

<b>Junction: (A4054) Cardiff Road / Ffordd Bleddyn</b>								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (Ffordd Bleddyn)	3.50	0.00	Y	Arm 4 Left	14.00	97.4 %	1775	1775
				Arm 5 Right	13.00	2.6 %		
2/1 (Cardiff Rd (e))	3.50	0.00	Y	Arm 5 Ahead	Inf	57.8 %	1874	1874
				Arm 6 Right	13.00	42.2 %		
3/1 (Cardiff Road (w))	3.50	0.00	Y	Arm 4 Ahead	Inf	97.9 %	1961	1961
				Arm 6 Left	14.00	2.1 %		
4/1 (exit lane east Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (exit lane west Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (exit lane north Lane 1)	Infinite Saturation Flow						Inf	Inf

Full Input Data And Results

Scenario 8: '2031 PM (no dev)' (FG8: '2031 PM (no dev)', Plan 1: 'Network Control Plan 1')

**Traffic Flows, Desired**

Desired Flow :

	Destination				
	A	B	C	Tot.	
Origin	A	0	268	11	279
	B	221	0	321	542
	C	16	253	0	269
	Tot.	237	521	332	1090

**Traffic Lane Flows**

Lane	Scenario 8: 2031 PM (no dev)
<b>Junction: (A4054) Cardiff Road / Ffordd Bleddyn</b>	
1/1	279
2/1	542
3/1	269
4/1	521
5/1	332
6/1	237

**Lane Saturation Flows**

<b>Junction: (A4054) Cardiff Road / Ffordd Bleddyn</b>								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (Ffordd Bleddyn)	3.50	0.00	Y	Arm 4 Left	14.00	96.1 %	1774	1774
				Arm 5 Right	13.00	3.9 %		
2/1 (Cardiff Rd (e))	3.50	0.00	Y	Arm 5 Ahead	Inf	59.2 %	1877	1877
				Arm 6 Right	13.00	40.8 %		
3/1 (Cardiff Road (w))	3.50	0.00	Y	Arm 4 Ahead	Inf	94.1 %	1953	1953
				Arm 6 Left	14.00	5.9 %		
4/1 (exit lane east Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (exit lane west Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (exit lane north Lane 1)	Infinite Saturation Flow						Inf	Inf

Full Input Data And Results

**Scenario 9: '2031 AM (with dev)'** (FG11: '2031 AM (with dev)', Plan 1: 'Network Control Plan 1')

**Traffic Flows, Desired**

**Desired Flow :**

		Destination			
		A	B	C	Tot.
Origin	A	0	342	9	351
	B	202	0	262	464
	C	15	461	0	476
	Tot.	217	803	271	1291

**Traffic Lane Flows**

Lane	Scenario 9: 2031 AM (with dev)
<b>Junction: (A4054) Cardiff Road / Ffordd Bleddyn</b>	
1/1	351
2/1	464
3/1	476
4/1	803
5/1	271
6/1	217

**Lane Saturation Flows**

<b>Junction: (A4054) Cardiff Road / Ffordd Bleddyn</b>								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (Ffordd Bleddyn)	3.50	0.00	Y	Arm 4 Left	14.00	97.4 %	1775	1775
				Arm 5 Right	13.00	2.6 %		
2/1 (Cardiff Rd (e))	3.50	0.00	Y	Arm 5 Ahead	Inf	56.5 %	1871	1871
				Arm 6 Right	13.00	43.5 %		
3/1 (Cardiff Road (w))	3.50	0.00	Y	Arm 4 Ahead	Inf	96.8 %	1958	1958
				Arm 6 Left	14.00	3.2 %		
4/1 (exit lane east Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (exit lane west Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (exit lane north Lane 1)	Infinite Saturation Flow						Inf	Inf

Full Input Data And Results

Scenario 10: '2031 PM (with dev)' (FG12: '2031 PM (with dev)', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	274	14	288
	B	222	0	321	543
	C	16	253	0	269
	Tot.	238	527	335	1100

Traffic Lane Flows

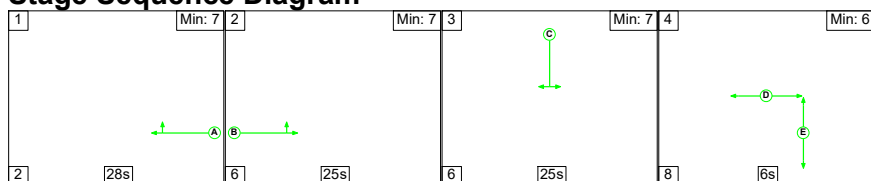
Lane	Scenario 10: 2031 PM (with dev)
<b>Junction: (A4054) Cardiff Road / Ffordd Bleddyn</b>	
1/1	288
2/1	543
3/1	269
4/1	527
5/1	335
6/1	238

Lane Saturation Flows

<b>Junction: (A4054) Cardiff Road / Ffordd Bleddyn</b>								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (Ffordd Bleddyn)	3.50	0.00	Y	Arm 4 Left	14.00	95.1 %	1774	1774
				Arm 5 Right	13.00	4.9 %		
2/1 (Cardiff Rd (e))	3.50	0.00	Y	Arm 5 Ahead	Inf	59.1 %	1876	1876
				Arm 6 Right	13.00	40.9 %		
3/1 (Cardiff Road (w))	3.50	0.00	Y	Arm 4 Ahead	Inf	94.1 %	1953	1953
				Arm 6 Left	14.00	5.9 %		
4/1 (exit lane east Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (exit lane west Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (exit lane north Lane 1)	Infinite Saturation Flow						Inf	Inf

Scenario 1: 'Base AM' (FG1: 'Base AM', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

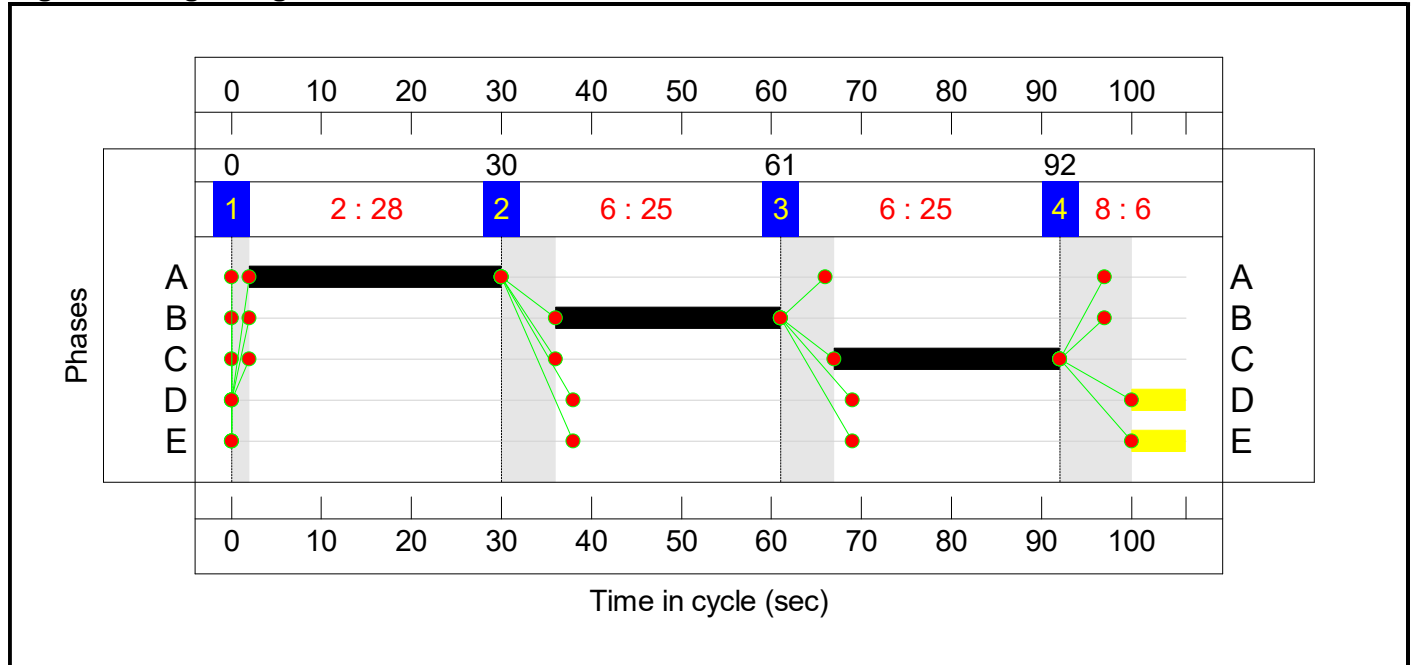


Full Input Data And Results

Stage Timings

Stage	1	2	3	4
Duration	28	25	25	6
Change Point	0	30	61	92

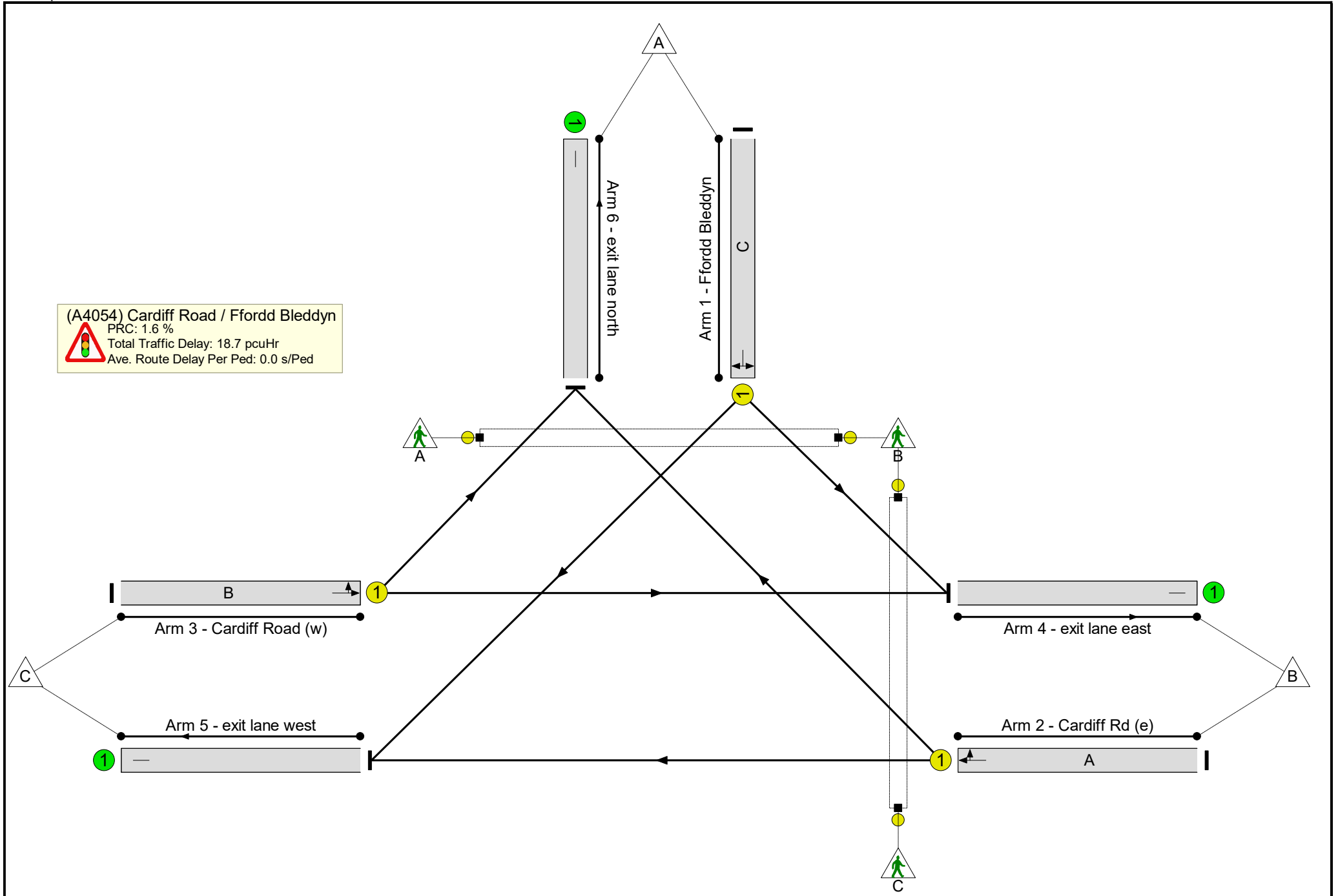
Signal Timings Diagram





Full Input Data And Results  
**Network Layout Diagram**

Full Input Data And Results



Full Input Data And Results

**Network Results**

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
<b>Network</b>	-	-	<b>N/A</b>	-	-		-	-	-	-	-	-	<b>88.6%</b>
<b>(A4054) Cardiff Road / Ffordd Bleddyn</b>	-	-	<b>N/A</b>	-	-		-	-	-	-	-	-	<b>88.6%</b>
1/1	Ffordd Bleddyn Left Right	U	N/A	N/A	C		1	25	-	325	1775	435	74.6%
2/1	Cardiff Rd (e) Ahead Right	U	N/A	N/A	A		1	28	-	408	1874	513	79.6%
3/1	Cardiff Road (w) Ahead Left	U	N/A	N/A	B		1	25	-	426	1961	481	88.6%
4/1	exit lane east	U	N/A	N/A	-		-	-	-	734	Inf	Inf	0.0%
5/1	exit lane west	U	N/A	N/A	-		-	-	-	244	Inf	Inf	0.0%
6/1	exit lane north	U	N/A	N/A	-		-	-	-	181	Inf	Inf	0.0%
Ped Link: P1	Ffordd Bleddyn	-	N/A	-	D		1	6	-	0	-	4075	0.0%
Ped Link: P2	Cardiff Rd (e)	-	N/A	-	E		1	6	-	0	-	4075	0.0%

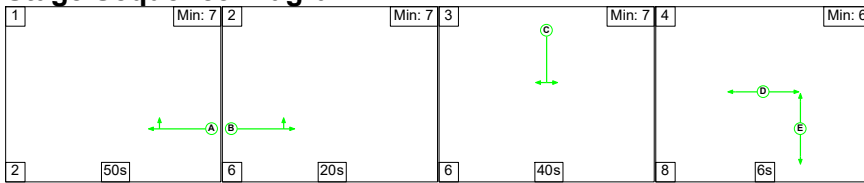
Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
<b>Network</b>	-	-	0	0	0	12.0	6.8	0.0	18.7	-	-	-	-
<b>(A4054) Cardiff Road / Ffordd Bleddyn</b>	-	-	0	0	0	12.0	6.8	0.0	18.7	-	-	-	-
1/1	325	325	-	-	-	3.3	1.4	-	4.8	52.9	8.8	1.4	10.2
2/1	408	408	-	-	-	4.1	1.9	-	5.9	52.4	11.1	1.9	13.0
3/1	426	426	-	-	-	4.6	3.4	-	8.0	67.7	12.1	3.4	15.5
4/1	734	734	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	244	244	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	181	181	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
Ped Link: P1	0	0	-	-	-	-	-	-	0.0	0.0	-	-	0.0
Ped Link: P2	0	0	-	-	-	-	-	-	0.0	0.0	-	-	0.0
<p>C1                      PRC for Signalled Lanes (%): 1.6                      Total Delay for Signalled Lanes (pcuHr): 18.71                      Cycle Time (s): 106  PRC Over All Lanes (%): 1.6                      Total Delay Over All Lanes(pcuHr): 18.71</p>													

Full Input Data And Results

Scenario 2: 'Base PM' (FG2: 'Base PM', Plan 1: 'Network Control Plan 1')

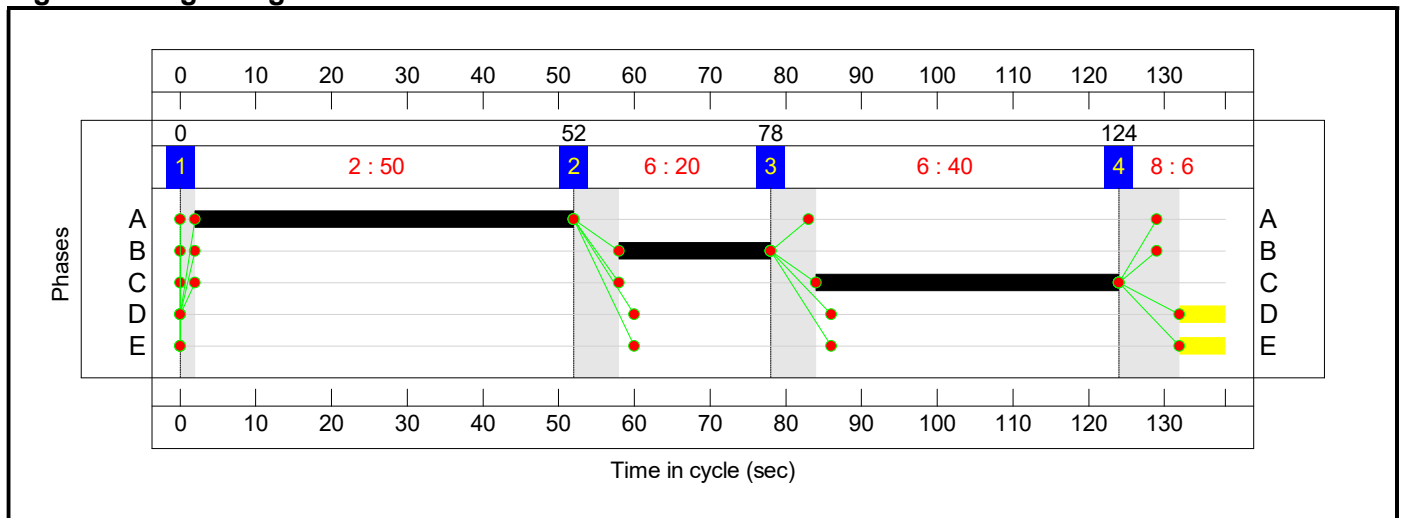
Stage Sequence Diagram



Stage Timings

Stage	1	2	3	4
Duration	50	20	40	6
Change Point	0	52	78	124

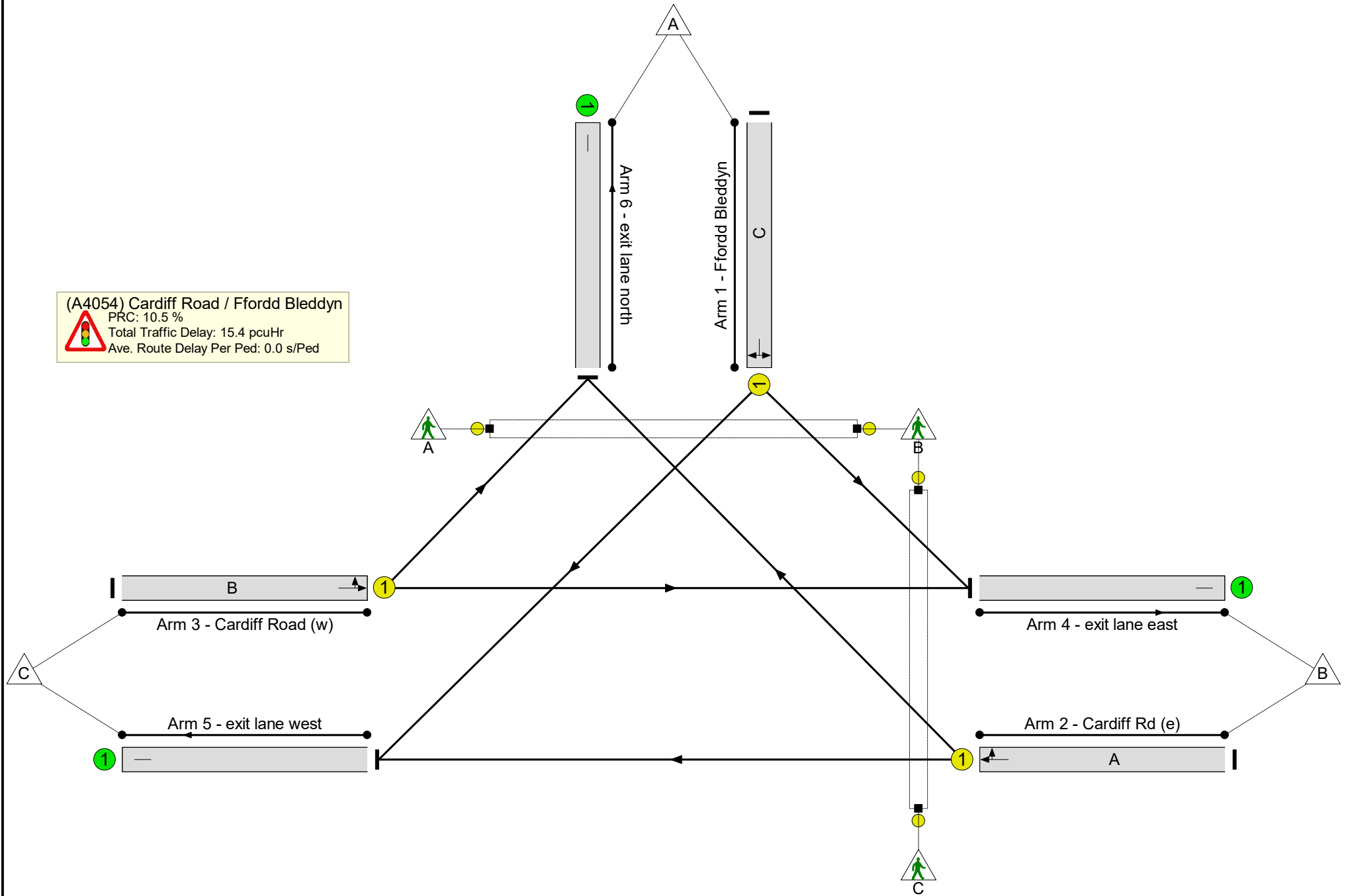
Signal Timings Diagram



Full Input Data And Results  
**Network Layout Diagram**

Full Input Data And Results

(A4054) Cardiff Road / Ffordd Bleddyn  
PRC: 10.5 %  
Total Traffic Delay: 15.4 pcuHr  
Ave. Route Delay Per Ped: 0.0 s/Ped



Full Input Data And Results

**Network Results**

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
<b>Network</b>	-	-	<b>N/A</b>	-	-		-	-	-	-	-	-	<b>81.4%</b>
<b>(A4054) Cardiff Road / Ffordd Bleddyn</b>	-	-	<b>N/A</b>	-	-		-	-	-	-	-	-	<b>81.4%</b>
1/1	Ffordd Bleddyn Left Right	U	N/A	N/A	C		1	40	-	252	1774	527	47.8%
2/1	Cardiff Rd (e) Ahead Right	U	N/A	N/A	A		1	50	-	492	1876	693	71.0%
3/1	Cardiff Road (w) Ahead Left	U	N/A	N/A	B		1	20	-	242	1953	297	81.4%
4/1	exit lane east	U	N/A	N/A	-		-	-	-	470	Inf	Inf	0.0%
5/1	exit lane west	U	N/A	N/A	-		-	-	-	299	Inf	Inf	0.0%
6/1	exit lane north	U	N/A	N/A	-		-	-	-	217	Inf	Inf	0.0%
Ped Link: P1	Ffordd Bleddyn	-	N/A	-	D		1	6	-	0	-	3130	0.0%
Ped Link: P2	Cardiff Rd (e)	-	N/A	-	E		1	6	-	0	-	3130	0.0%



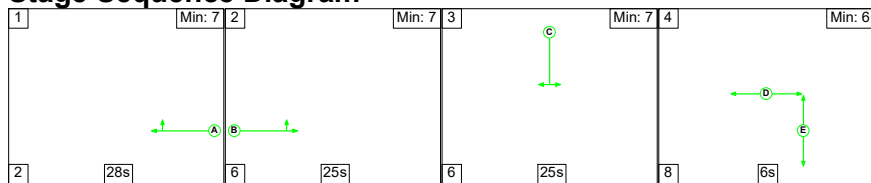
Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
<b>Network</b>	-	-	0	0	0	11.7	3.7	0.0	15.4	-	-	-	-
<b>(A4054) Cardiff Road / Ffordd Bleddyn</b>	-	-	0	0	0	11.7	3.7	0.0	15.4	-	-	-	-
1/1	252	252	-	-	-	2.8	0.5	-	3.2	46.3	7.9	0.5	8.4
2/1	492	492	-	-	-	5.1	1.2	-	6.3	46.0	16.0	1.2	17.2
3/1	242	242	-	-	-	3.8	2.0	-	5.8	87.0	8.9	2.0	11.0
4/1	470	470	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	299	299	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	217	217	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
Ped Link: P1	0	0	-	-	-	-	-	-	0.0	0.0	-	-	0.0
Ped Link: P2	0	0	-	-	-	-	-	-	0.0	0.0	-	-	0.0
<p>C1                      PRC for Signalled Lanes (%): 10.5                      Total Delay for Signalled Lanes (pcuHr): 15.37                      Cycle Time (s): 138  PRC Over All Lanes (%): 10.5                      Total Delay Over All Lanes(pcuHr): 15.37</p>													

Full Input Data And Results

Scenario 3: '2021 AM (no dev)' (FG3: '2021 AM (no dev)', Plan 1: 'Network Control Plan 1')

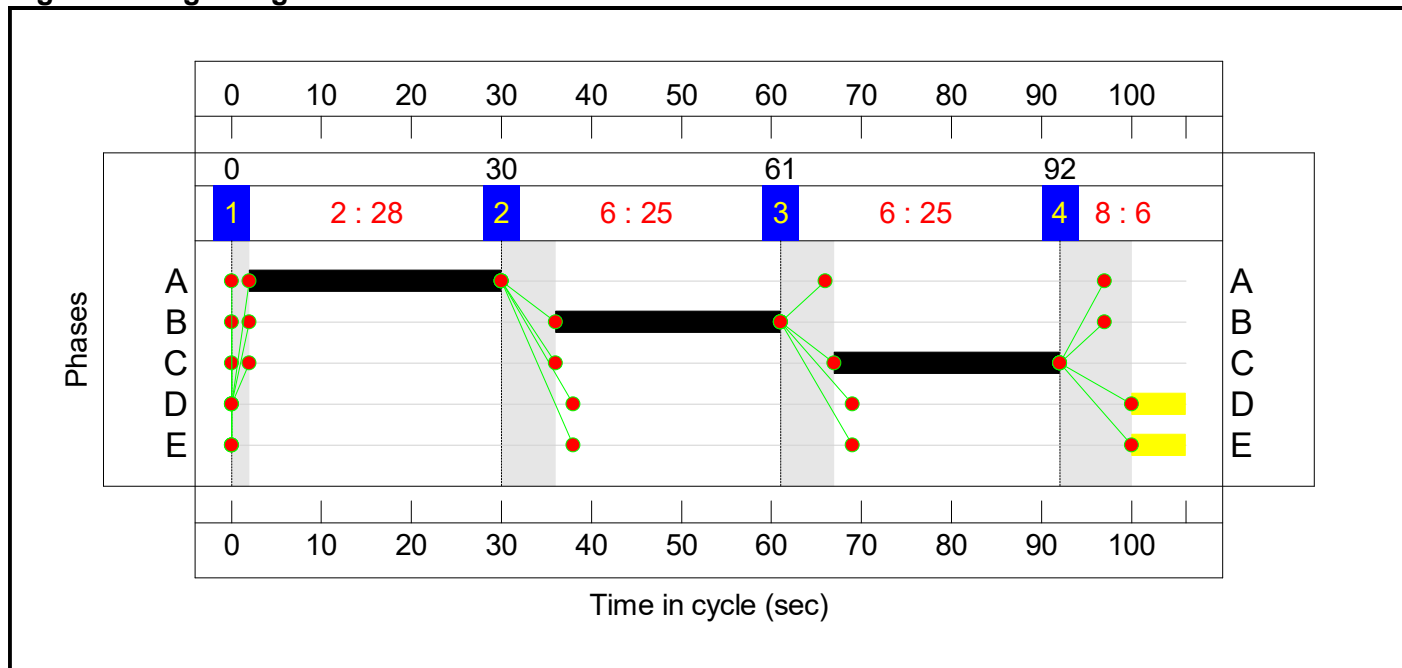
Stage Sequence Diagram



Stage Timings

Stage	1	2	3	4
Duration	28	25	25	6
Change Point	0	30	61	92

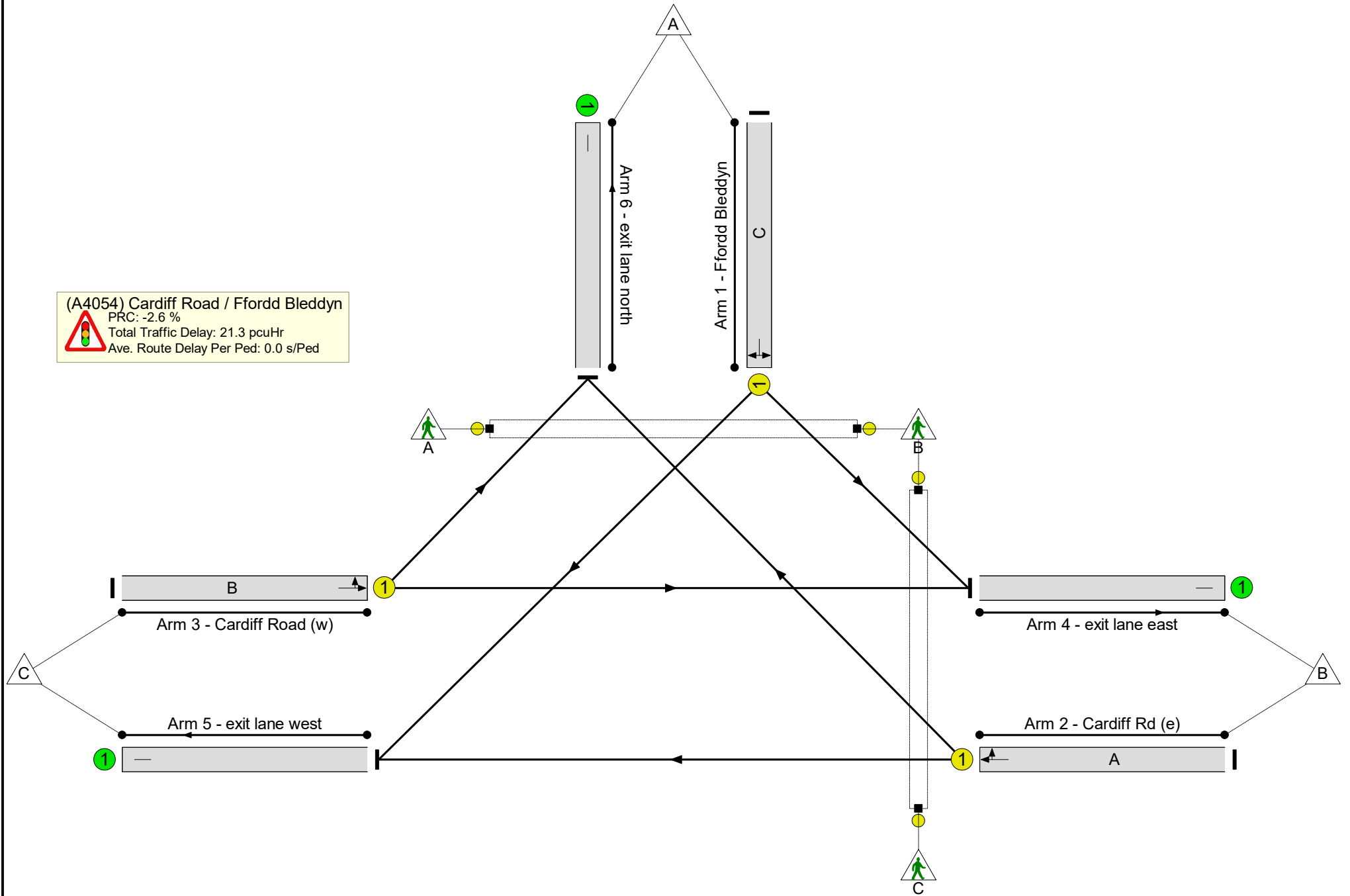
Signal Timings Diagram



Full Input Data And Results  
**Network Layout Diagram**

Full Input Data And Results

(A4054) Cardiff Road / Ffordd Bleddyn  
PRC: -2.6 %  
Total Traffic Delay: 21.3 pcuHr  
Ave. Route Delay Per Ped: 0.0 s/Ped



Full Input Data And Results

**Network Results**

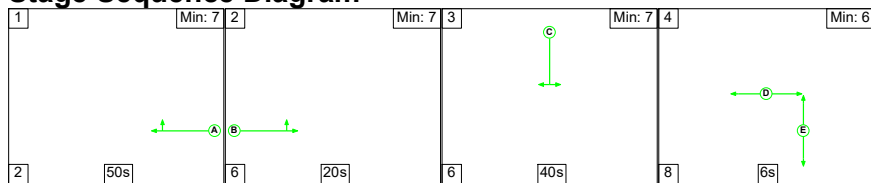
Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	-	-	N/A	-	-		-	-	-	-	-	-	92.3%
(A4054) Cardiff Road / Ffordd Bleddyn	-	-	N/A	-	-		-	-	-	-	-	-	92.3%
1/1	Ffordd Bleddyn Left Right	U	N/A	N/A	C		1	25	-	335	1775	435	76.9%
2/1	Cardiff Rd (e) Ahead Right	U	N/A	N/A	A		1	28	-	427	1874	513	83.3%
3/1	Cardiff Road (w) Ahead Left	U	N/A	N/A	B		1	25	-	444	1961	481	92.3%
4/1	exit lane east	U	N/A	N/A	-		-	-	-	762	Inf	Inf	0.0%
5/1	exit lane west	U	N/A	N/A	-		-	-	-	255	Inf	Inf	0.0%
6/1	exit lane north	U	N/A	N/A	-		-	-	-	189	Inf	Inf	0.0%
Ped Link: P1	Ffordd Bleddyn	-	N/A	-	D		1	6	-	0	-	4075	0.0%
Ped Link: P2	Cardiff Rd (e)	-	N/A	-	E		1	6	-	0	-	4075	0.0%



Full Input Data And Results

Scenario 4: '2021 PM (no dev)' (FG4: '2021 PM (no dev)', Plan 1: 'Network Control Plan 1')

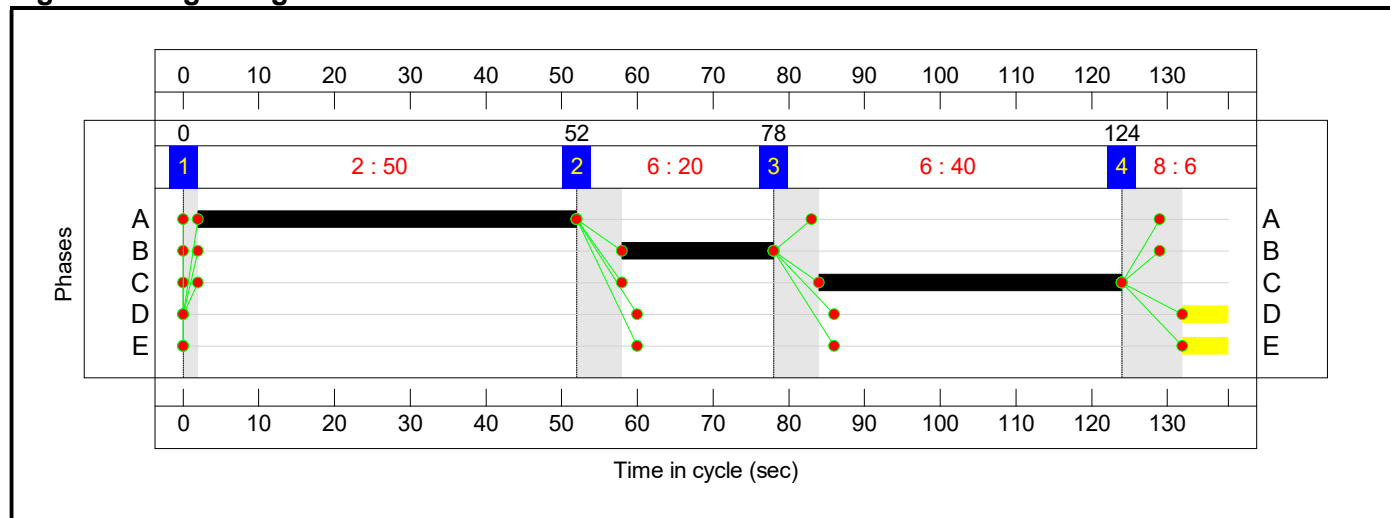
Stage Sequence Diagram



Stage Timings

Stage	1	2	3	4
Duration	50	20	40	6
Change Point	0	52	78	124

Signal Timings Diagram

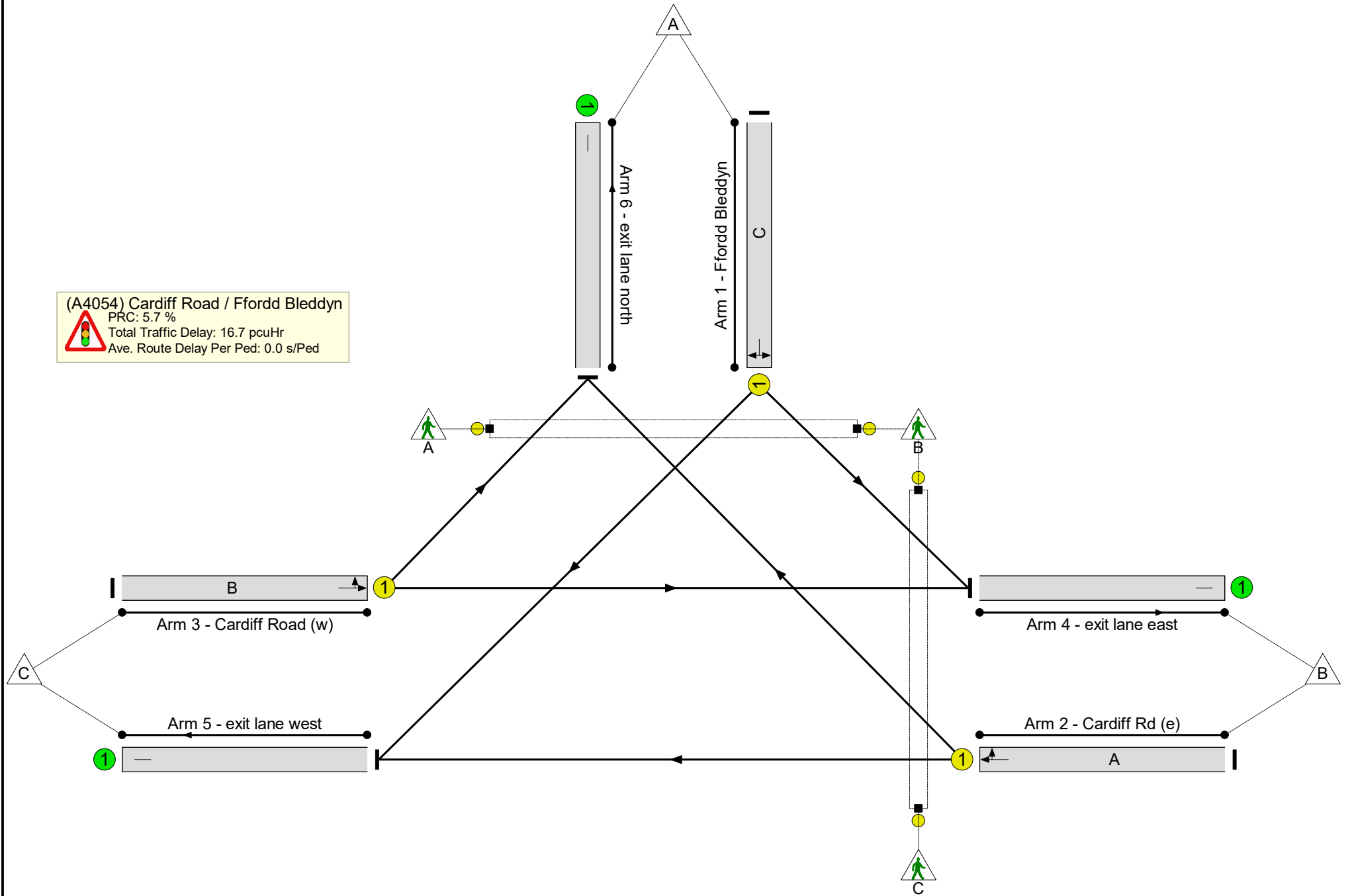


Full Input Data And Results  
**Network Layout Diagram**



Full Input Data And Results

(A4054) Cardiff Road / Ffordd Bleddyn  
PRC: 5.7 %  
Total Traffic Delay: 16.7 pcuHr  
Ave. Route Delay Per Ped: 0.0 s/Ped



Full Input Data And Results

**Network Results**

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
<b>Network</b>	-	-	<b>N/A</b>	-	-		-	-	-	-	-	-	<b>85.1%</b>
<b>(A4054) Cardiff Road / Ffordd Bleddyn</b>	-	-	<b>N/A</b>	-	-		-	-	-	-	-	-	<b>85.1%</b>
1/1	Ffordd Bleddyn Left Right	U	N/A	N/A	C		1	40	-	263	1774	527	49.9%
2/1	Cardiff Rd (e) Ahead Right	U	N/A	N/A	A		1	50	-	512	1876	693	73.8%
3/1	Cardiff Road (w) Ahead Left	U	N/A	N/A	B		1	20	-	253	1953	297	85.1%
4/1	exit lane east	U	N/A	N/A	-		-	-	-	490	Inf	Inf	0.0%
5/1	exit lane west	U	N/A	N/A	-		-	-	-	313	Inf	Inf	0.0%
6/1	exit lane north	U	N/A	N/A	-		-	-	-	225	Inf	Inf	0.0%
Ped Link: P1	Ffordd Bleddyn	-	N/A	-	D		1	6	-	0	-	3130	0.0%
Ped Link: P2	Cardiff Rd (e)	-	N/A	-	E		1	6	-	0	-	3130	0.0%

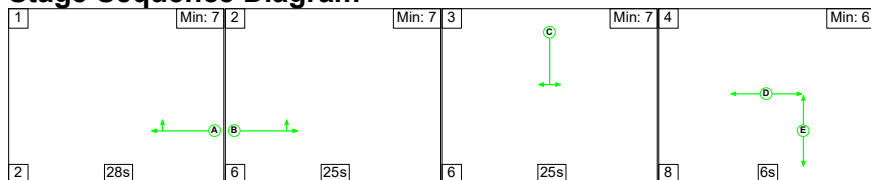
Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
<b>Network</b>	-	-	0	0	0	12.3	4.5	0.0	16.7	-	-	-	-
<b>(A4054) Cardiff Road / Ffordd Bleddyn</b>	-	-	0	0	0	12.3	4.5	0.0	16.7	-	-	-	-
1/1	263	263	-	-	-	2.9	0.5	-	3.4	46.8	8.3	0.5	8.8
2/1	512	512	-	-	-	5.4	1.4	-	6.8	47.5	16.9	1.4	18.3
3/1	253	253	-	-	-	4.0	2.6	-	6.6	93.5	9.4	2.6	12.0
4/1	490	490	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	313	313	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	225	225	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
Ped Link: P1	0	0	-	-	-	-	-	-	0.0	0.0	-	-	0.0
Ped Link: P2	0	0	-	-	-	-	-	-	0.0	0.0	-	-	0.0
<p>C1                      PRC for Signalled Lanes (%): 5.7                      Total Delay for Signalled Lanes (pcuHr): 16.74                      Cycle Time (s): 138  PRC Over All Lanes (%): 5.7                      Total Delay Over All Lanes(pcuHr): 16.74</p>													

Full Input Data And Results

Scenario 5: '2021 AM (with dev)' (FG9: '2021 AM (with dev)', Plan 1: 'Network Control Plan 1')

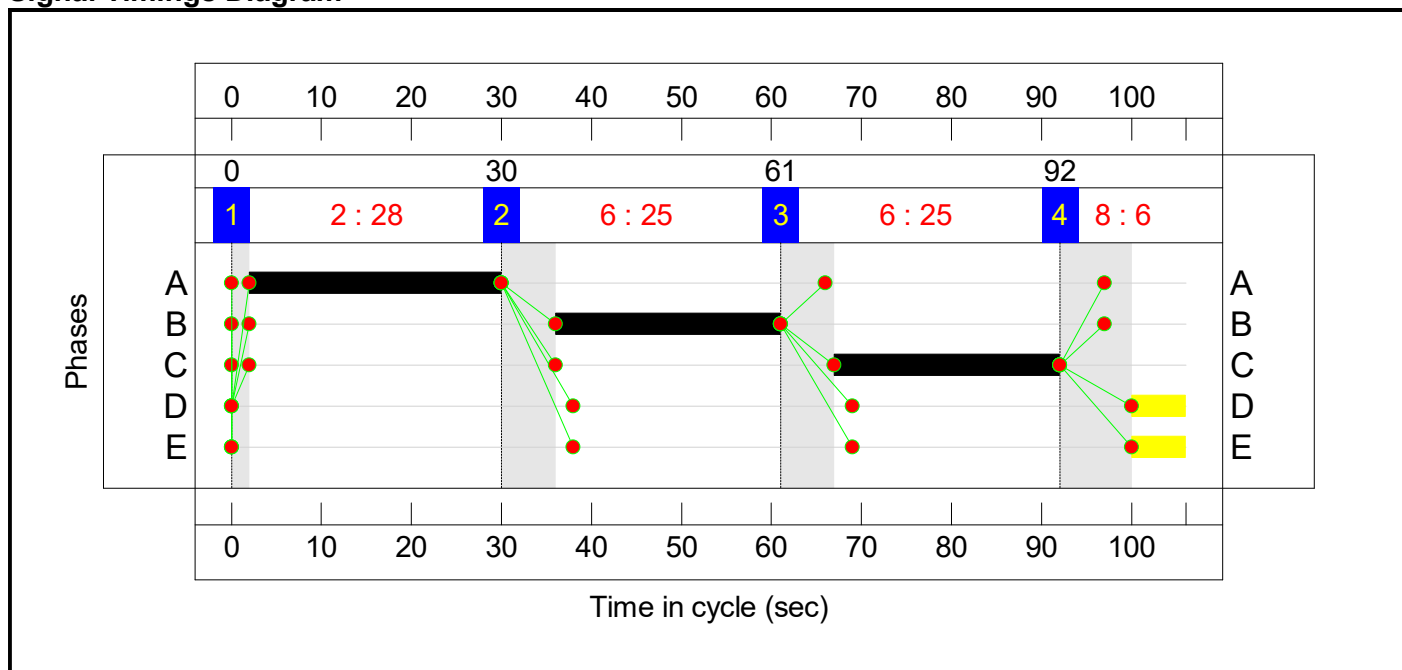
Stage Sequence Diagram



Stage Timings

Stage	1	2	3	4
Duration	28	25	25	6
Change Point	0	30	61	92

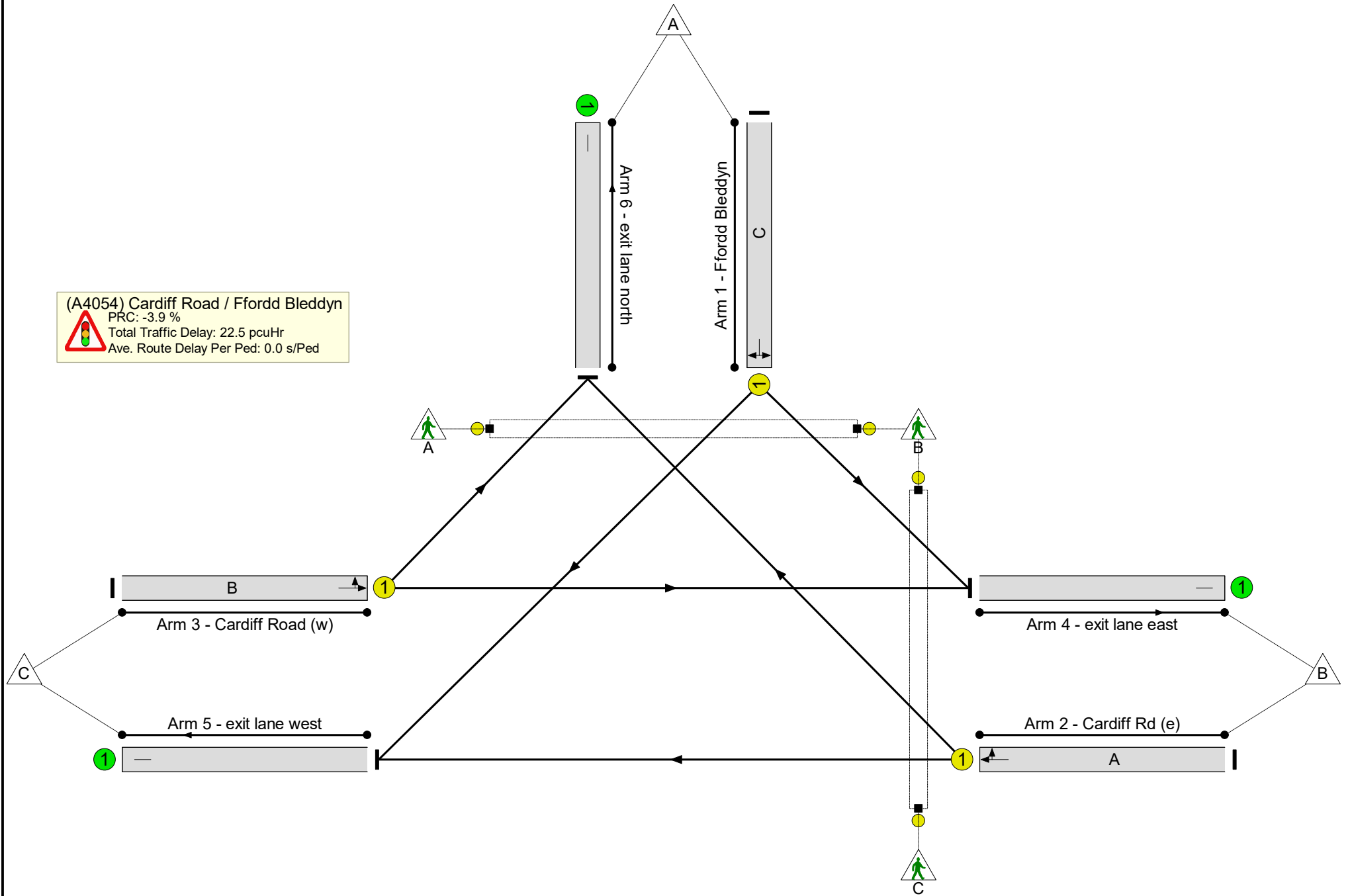
Signal Timings Diagram



Full Input Data And Results  
**Network Layout Diagram**

Full Input Data And Results

(A4054) Cardiff Road / Ffordd Bleddyn  
PRC: -3.9 %  
Total Traffic Delay: 22.5 pcuHr  
Ave. Route Delay Per Ped: 0.0 s/Ped



Full Input Data And Results

**Network Results**

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	-	-	N/A	-	-		-	-	-	-	-	-	93.5%
(A4054) Cardiff Road / Ffordd Bleddyn	-	-	N/A	-	-		-	-	-	-	-	-	93.5%
1/1	Ffordd Bleddyn Left Right	U	N/A	N/A	C		1	25	-	335	1775	435	76.9%
2/1	Cardiff Rd (e) Ahead Right	U	N/A	N/A	A		1	28	-	438	1871	512	85.6%
3/1	Cardiff Road (w) Ahead Left	U	N/A	N/A	B		1	25	-	449	1958	480	93.5%
4/1	exit lane east	U	N/A	N/A	-		-	-	-	762	Inf	Inf	0.0%
5/1	exit lane west	U	N/A	N/A	-		-	-	-	255	Inf	Inf	0.0%
6/1	exit lane north	U	N/A	N/A	-		-	-	-	205	Inf	Inf	0.0%
Ped Link: P1	Ffordd Bleddyn	-	N/A	-	D		1	6	-	0	-	4075	0.0%
Ped Link: P2	Cardiff Rd (e)	-	N/A	-	E		1	6	-	0	-	4075	0.0%

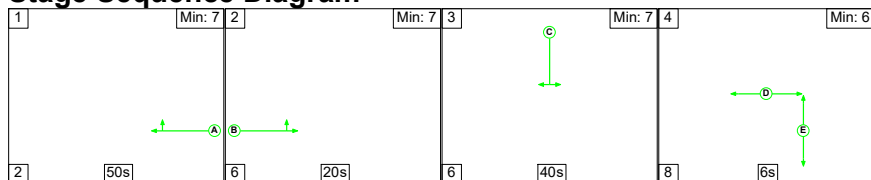




Full Input Data And Results

Scenario 6: '2021 PM (with dev)' (FG10: '2021 PM (with dev)', Plan 1: 'Network Control Plan 1')

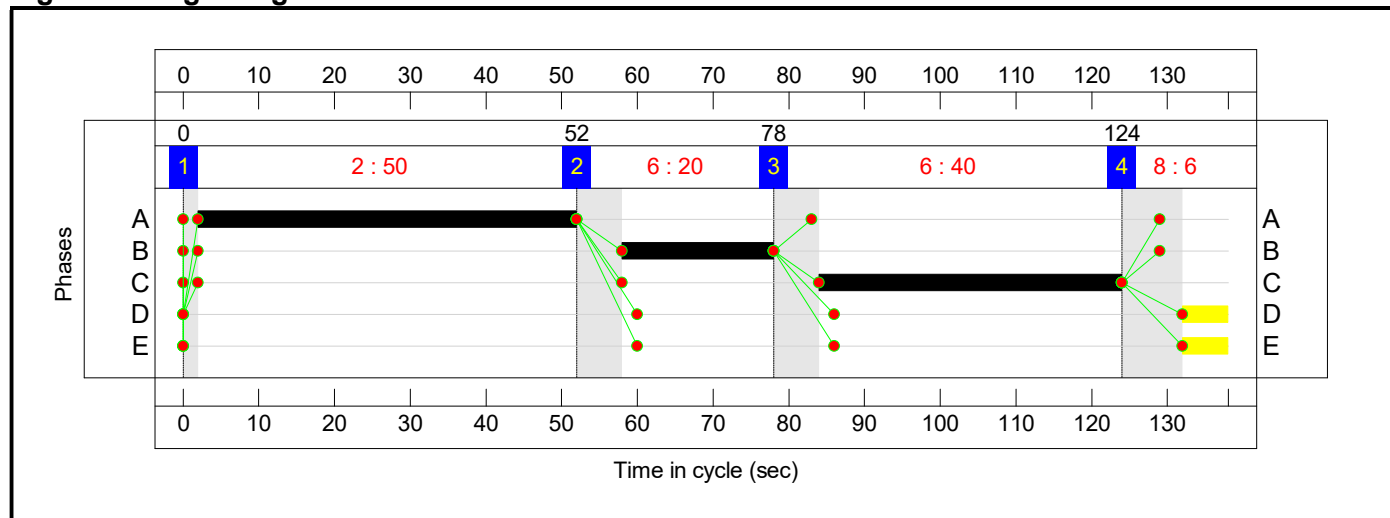
Stage Sequence Diagram



Stage Timings

Stage	1	2	3	4
Duration	50	20	40	6
Change Point	0	52	78	124

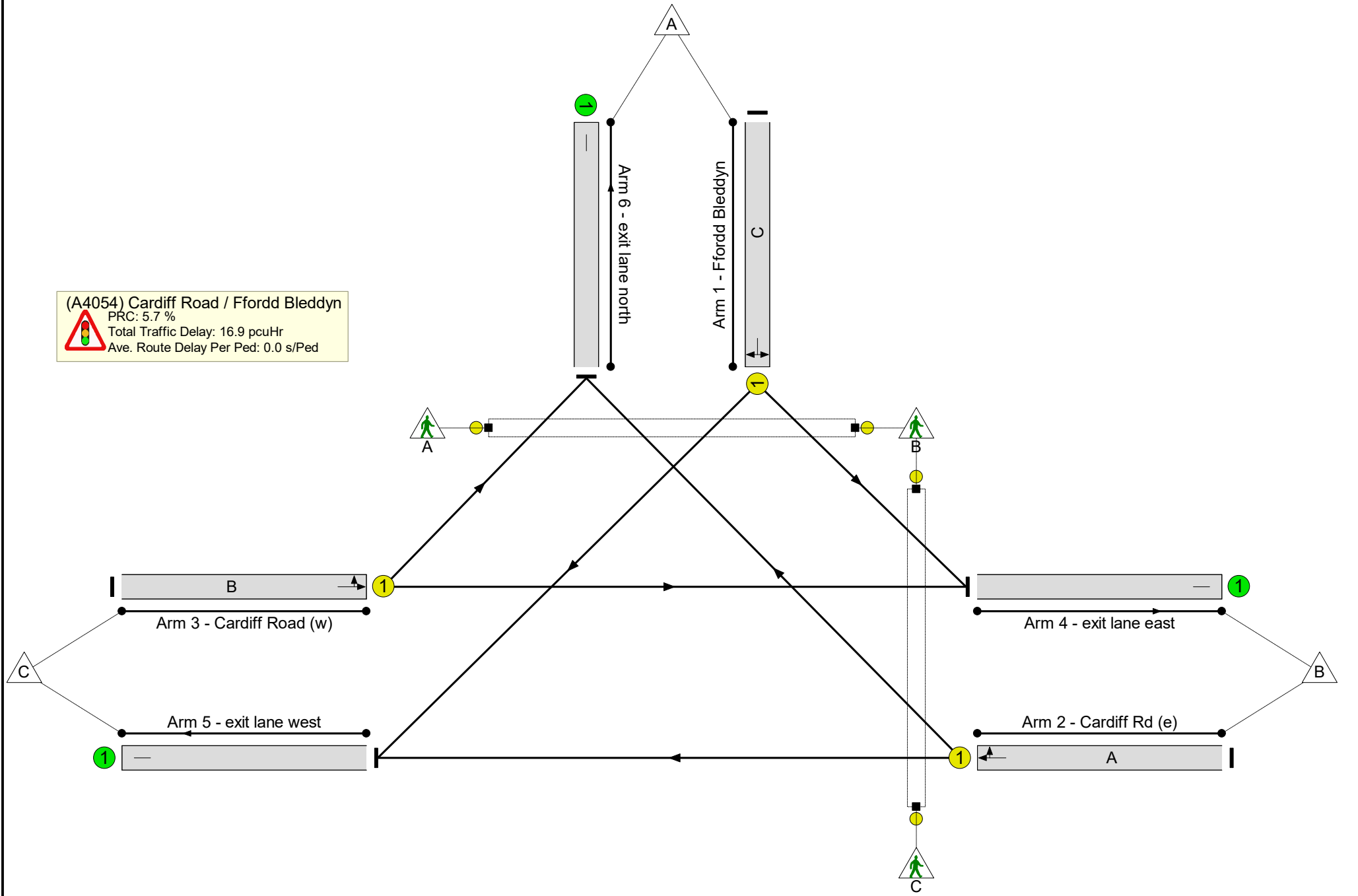
Signal Timings Diagram



Full Input Data And Results  
**Network Layout Diagram**

Full Input Data And Results

(A4054) Cardiff Road / Ffordd Bleddyn  
PRC: 5.7 %  
Total Traffic Delay: 16.9 pcuHr  
Ave. Route Delay Per Ped: 0.0 s/Ped



Full Input Data And Results

**Network Results**

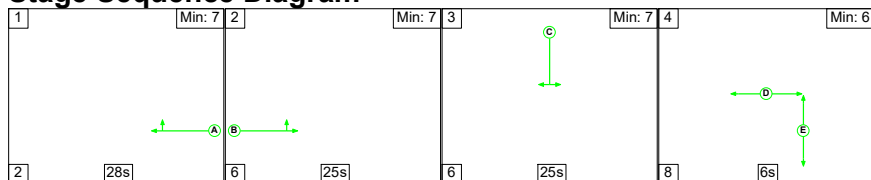
Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
<b>Network</b>	-	-	<b>N/A</b>	-	-		-	-	-	-	-	-	<b>85.1%</b>
<b>(A4054) Cardiff Road / Ffordd Bleddyn</b>	-	-	<b>N/A</b>	-	-		-	-	-	-	-	-	<b>85.1%</b>
1/1	Ffordd Bleddyn Left Right	U	N/A	N/A	C		1	40	-	272	1774	527	51.6%
2/1	Cardiff Rd (e) Ahead Right	U	N/A	N/A	A		1	50	-	513	1876	693	74.0%
3/1	Cardiff Road (w) Ahead Left	U	N/A	N/A	B		1	20	-	253	1953	297	85.1%
4/1	exit lane east	U	N/A	N/A	-		-	-	-	496	Inf	Inf	0.0%
5/1	exit lane west	U	N/A	N/A	-		-	-	-	316	Inf	Inf	0.0%
6/1	exit lane north	U	N/A	N/A	-		-	-	-	226	Inf	Inf	0.0%
Ped Link: P1	Ffordd Bleddyn	-	N/A	-	D		1	6	-	0	-	3130	0.0%
Ped Link: P2	Cardiff Rd (e)	-	N/A	-	E		1	6	-	0	-	3130	0.0%



Full Input Data And Results

Scenario 7: '2031 AM (no dev)' (FG7: '2031 AM (no dev)', Plan 1: 'Network Control Plan 1')

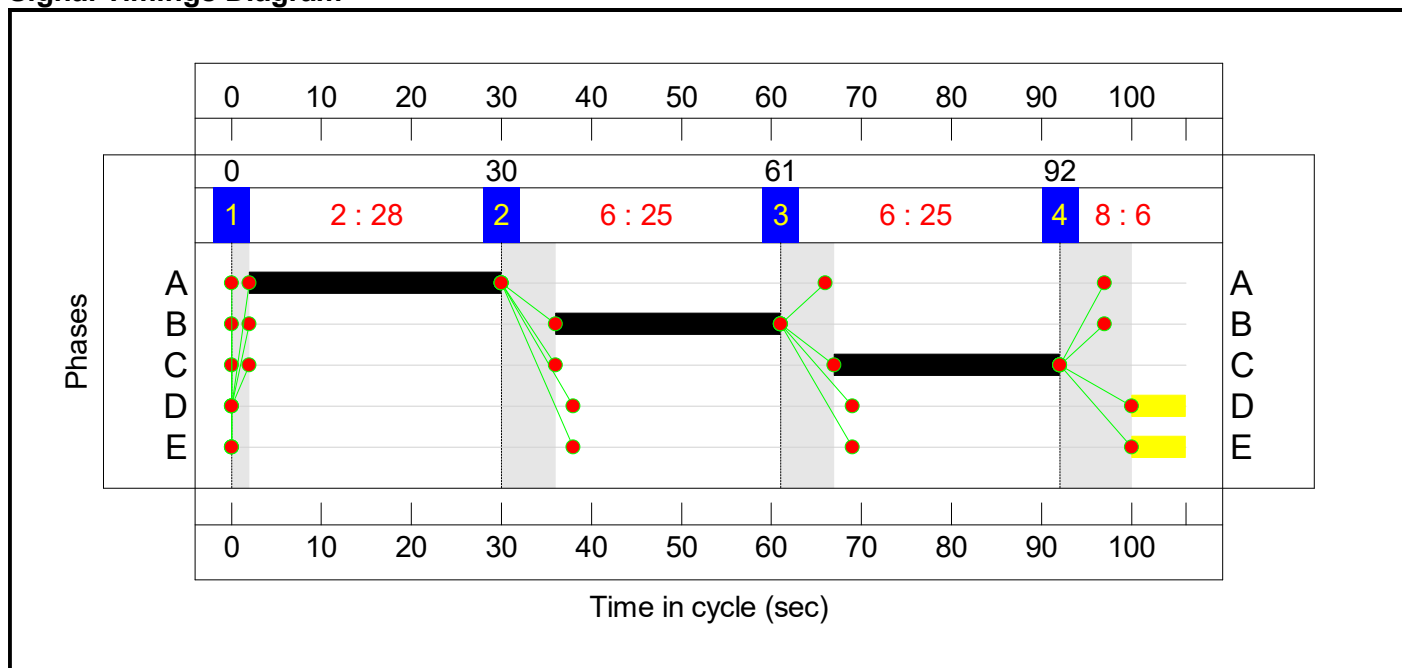
Stage Sequence Diagram



Stage Timings

Stage	1	2	3	4
Duration	28	25	25	6
Change Point	0	30	61	92

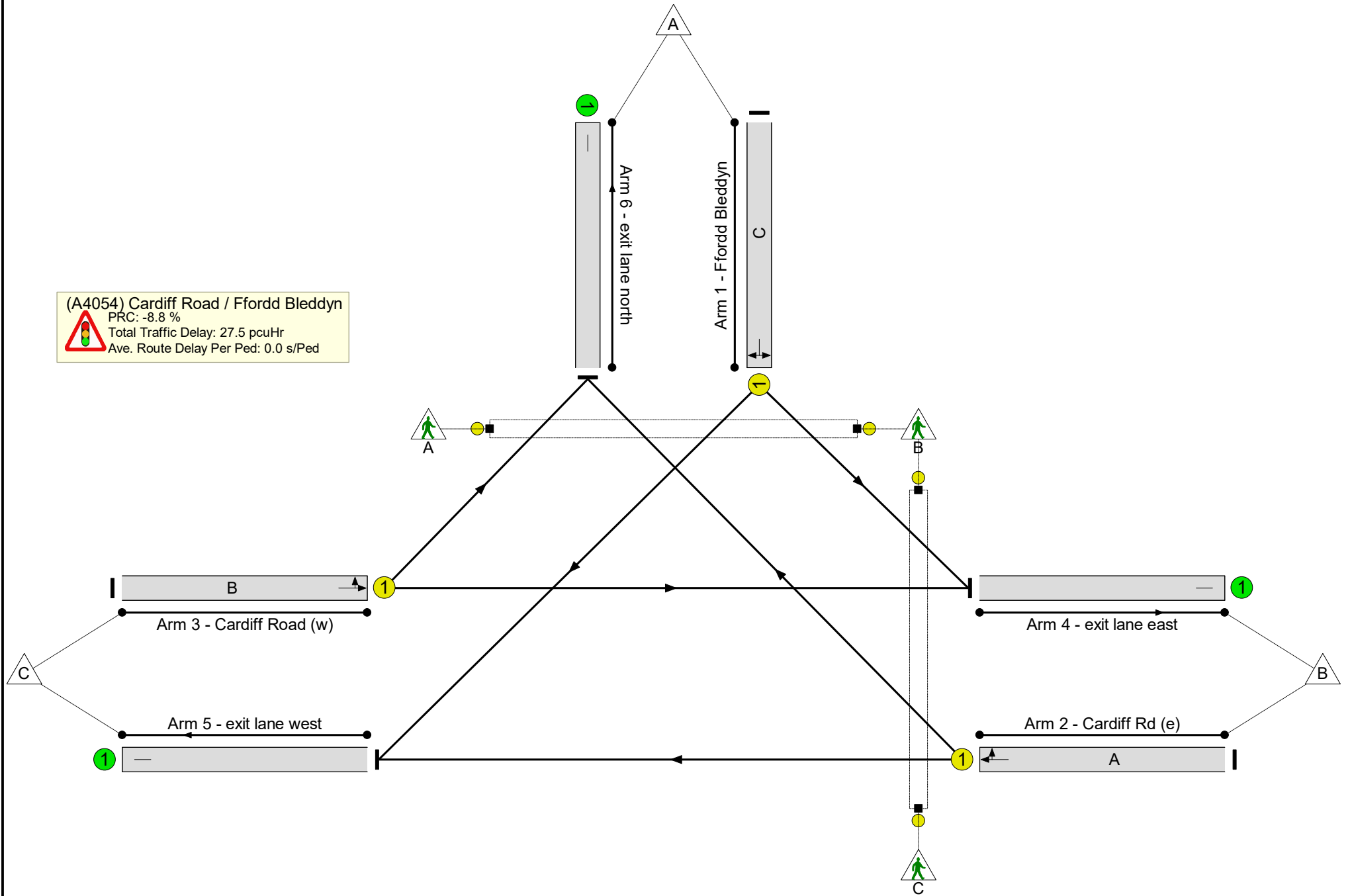
Signal Timings Diagram



Full Input Data And Results  
**Network Layout Diagram**

Full Input Data And Results

(A4054) Cardiff Road / Ffordd Bleddyn  
PRC: -8.8 %  
Total Traffic Delay: 27.5 pcuHr  
Ave. Route Delay Per Ped: 0.0 s/Ped





Full Input Data And Results

**Network Results**

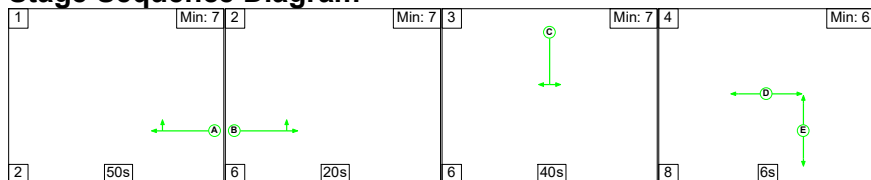
Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	-	-	N/A	-	-		-	-	-	-	-	-	97.9%
(A4054) Cardiff Road / Ffordd Bleddyn	-	-	N/A	-	-		-	-	-	-	-	-	97.9%
1/1	Ffordd Bleddyn Left Right	U	N/A	N/A	C		1	25	-	351	1775	435	80.6%
2/1	Cardiff Rd (e) Ahead Right	U	N/A	N/A	A		1	28	-	453	1874	513	88.4%
3/1	Cardiff Road (w) Ahead Left	U	N/A	N/A	B		1	25	-	471	1961	481	97.9%
4/1	exit lane east	U	N/A	N/A	-		-	-	-	803	Inf	Inf	0.0%
5/1	exit lane west	U	N/A	N/A	-		-	-	-	271	Inf	Inf	0.0%
6/1	exit lane north	U	N/A	N/A	-		-	-	-	201	Inf	Inf	0.0%
Ped Link: P1	Ffordd Bleddyn	-	N/A	-	D		1	6	-	0	-	4075	0.0%
Ped Link: P2	Cardiff Rd (e)	-	N/A	-	E		1	6	-	0	-	4075	0.0%



Full Input Data And Results

Scenario 8: '2031 PM (no dev)' (FG8: '2031 PM (no dev)', Plan 1: 'Network Control Plan 1')

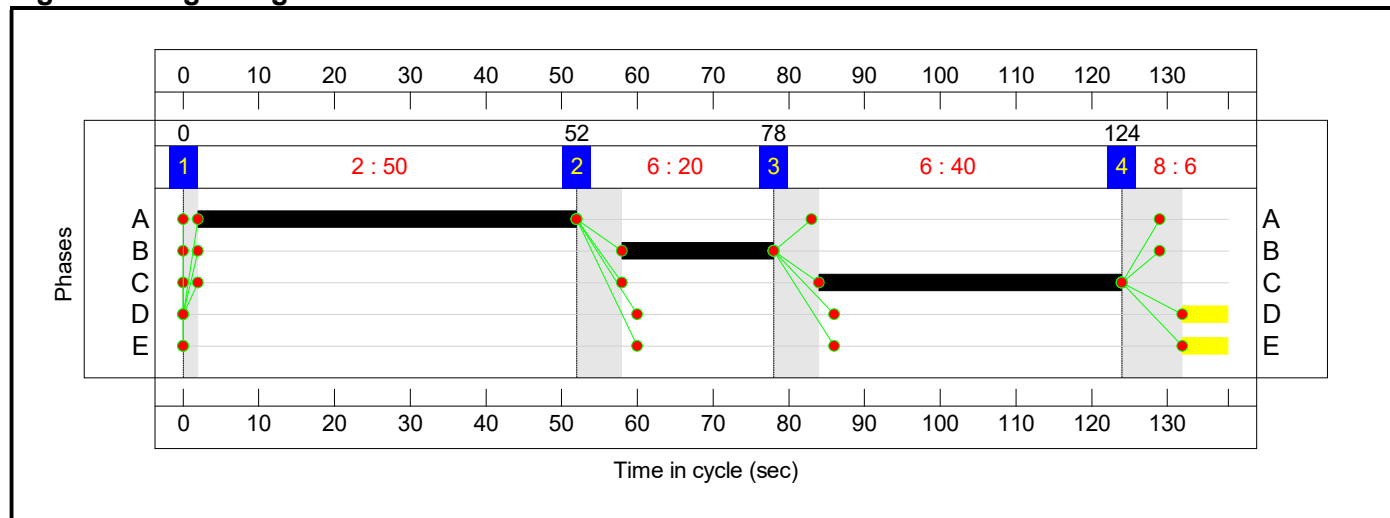
Stage Sequence Diagram



Stage Timings

Stage	1	2	3	4
Duration	50	20	40	6
Change Point	0	52	78	124

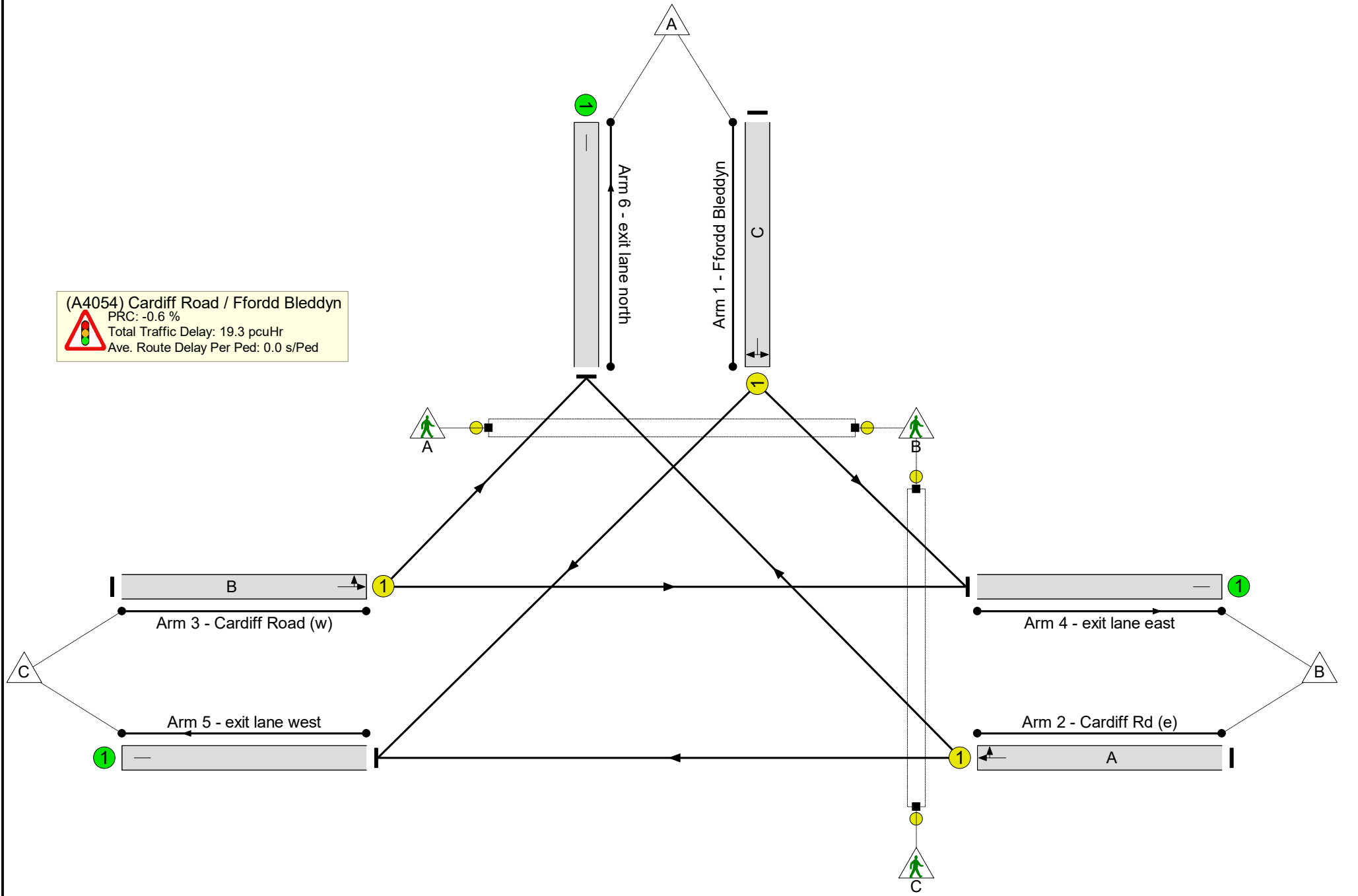
Signal Timings Diagram



Full Input Data And Results  
**Network Layout Diagram**

Full Input Data And Results

(A4054) Cardiff Road / Ffordd Bleddyn  
PRC: -0.6 %  
Total Traffic Delay: 19.3 pcuHr  
Ave. Route Delay Per Ped: 0.0 s/Ped



Full Input Data And Results

**Network Results**

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	-	-	N/A	-	-		-	-	-	-	-	-	90.5%
(A4054) Cardiff Road / Ffordd Bleddyn	-	-	N/A	-	-		-	-	-	-	-	-	90.5%
1/1	Ffordd Bleddyn Left Right	U	N/A	N/A	C		1	40	-	279	1774	527	52.9%
2/1	Cardiff Rd (e) Ahead Right	U	N/A	N/A	A		1	50	-	542	1877	694	78.1%
3/1	Cardiff Road (w) Ahead Left	U	N/A	N/A	B		1	20	-	269	1953	297	90.5%
4/1	exit lane east	U	N/A	N/A	-		-	-	-	521	Inf	Inf	0.0%
5/1	exit lane west	U	N/A	N/A	-		-	-	-	332	Inf	Inf	0.0%
6/1	exit lane north	U	N/A	N/A	-		-	-	-	237	Inf	Inf	0.0%
Ped Link: P1	Ffordd Bleddyn	-	N/A	-	D		1	6	-	0	-	3130	0.0%
Ped Link: P2	Cardiff Rd (e)	-	N/A	-	E		1	6	-	0	-	3130	0.0%

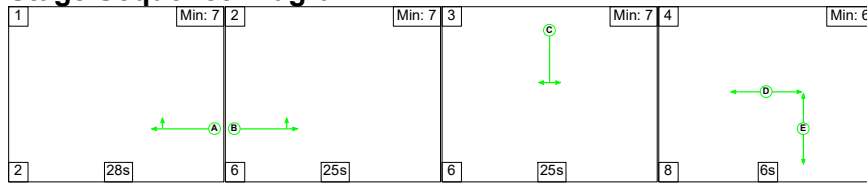
Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
<b>Network</b>	-	-	0	0	0	13.2	6.1	0.0	19.3	-	-	-	-
<b>(A4054) Cardiff Road / Ffordd Bleddyn</b>	-	-	0	0	0	13.2	6.1	0.0	19.3	-	-	-	-
1/1	279	279	-	-	-	3.1	0.6	-	3.7	47.7	8.9	0.6	9.5
2/1	542	542	-	-	-	5.8	1.7	-	7.6	50.2	18.4	1.7	20.1
3/1	269	269	-	-	-	4.3	3.8	-	8.1	107.9	10.1	3.8	13.9
4/1	521	521	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	332	332	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	237	237	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
Ped Link: P1	0	0	-	-	-	-	-	-	0.0	0.0	-	-	0.0
Ped Link: P2	0	0	-	-	-	-	-	-	0.0	0.0	-	-	0.0
<p>C1      PRC for Signalled Lanes (%): -0.6      Total Delay for Signalled Lanes (pcuHr): 19.31      Cycle Time (s): 138  PRC Over All Lanes (%): -0.6      Total Delay Over All Lanes(pcuHr): 19.31</p>													

Full Input Data And Results

Scenario 9: '2031 AM (with dev)' (FG11: '2031 AM (with dev)', Plan 1: 'Network Control Plan 1')

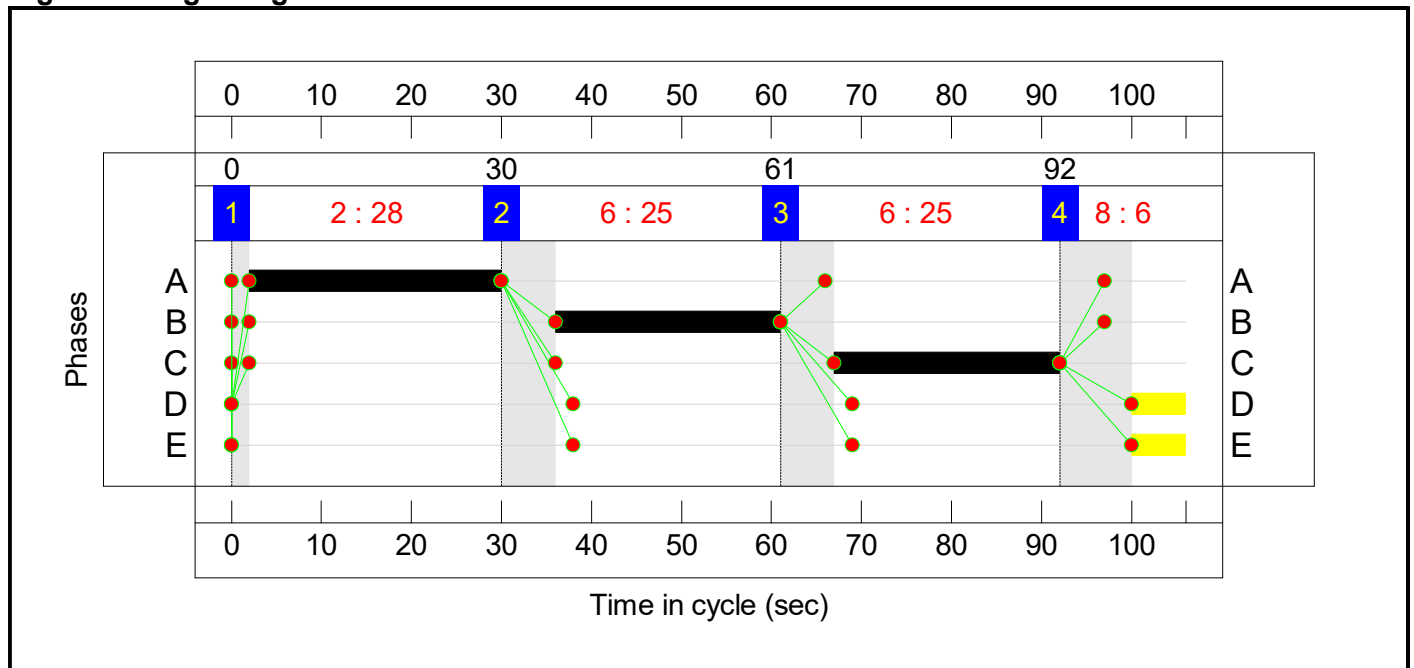
Stage Sequence Diagram



Stage Timings

Stage	1	2	3	4
Duration	28	25	25	6
Change Point	0	30	61	92

Signal Timings Diagram

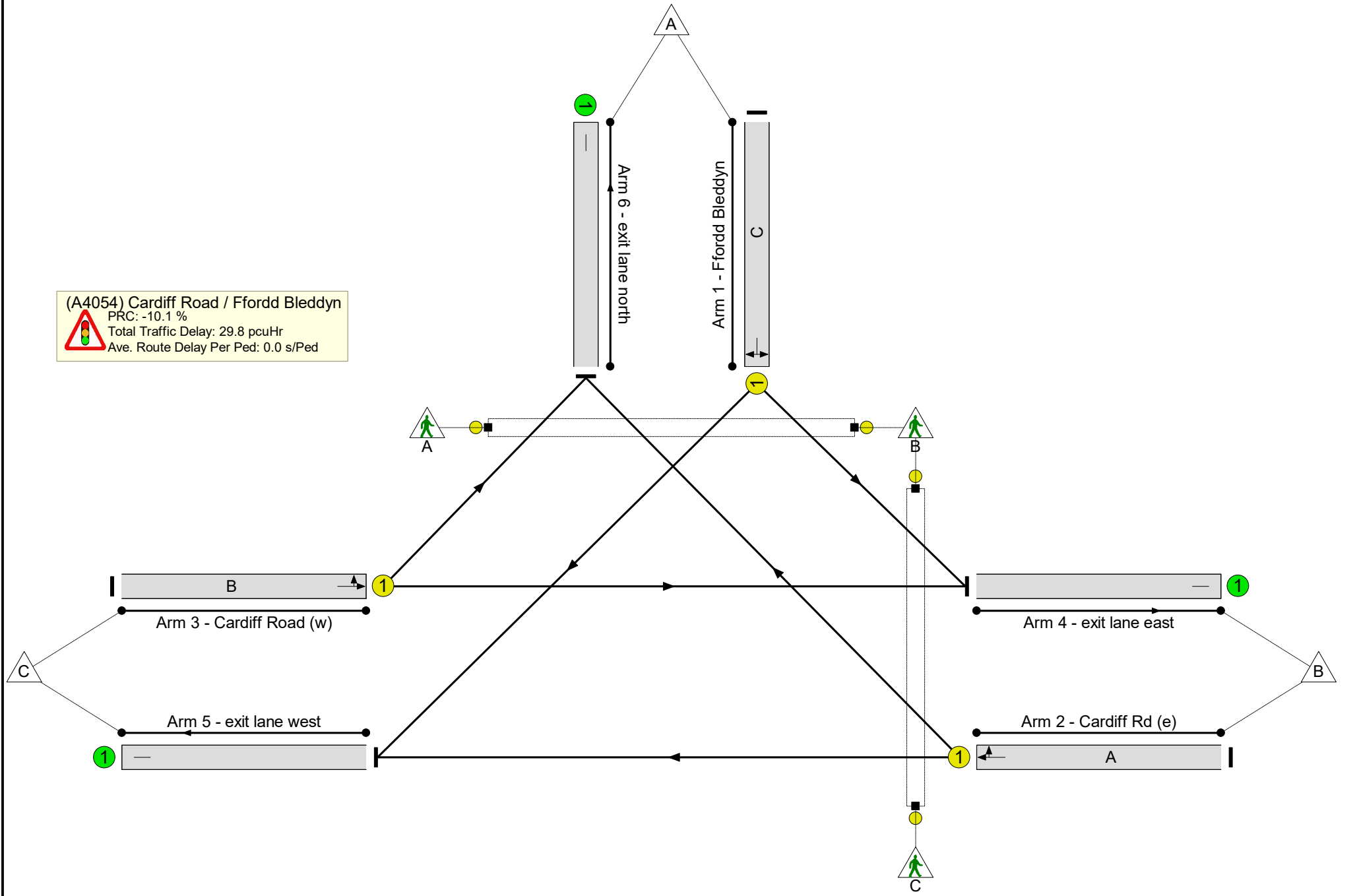




Full Input Data And Results  
**Network Layout Diagram**

Full Input Data And Results

(A4054) Cardiff Road / Ffordd Bleddyn  
PRC: -10.1 %  
Total Traffic Delay: 29.8 pcuHr  
Ave. Route Delay Per Ped: 0.0 s/Ped



Full Input Data And Results

**Network Results**

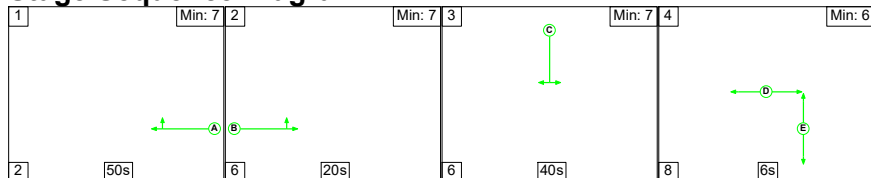
Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	-	-	N/A	-	-		-	-	-	-	-	-	99.1%
(A4054) Cardiff Road / Ffordd Bleddyn	-	-	N/A	-	-		-	-	-	-	-	-	99.1%
1/1	Ffordd Bleddyn Left Right	U	N/A	N/A	C		1	25	-	351	1775	435	80.6%
2/1	Cardiff Rd (e) Ahead Right	U	N/A	N/A	A		1	28	-	464	1871	512	90.6%
3/1	Cardiff Road (w) Ahead Left	U	N/A	N/A	B		1	25	-	476	1958	480	99.1%
4/1	exit lane east	U	N/A	N/A	-		-	-	-	803	Inf	Inf	0.0%
5/1	exit lane west	U	N/A	N/A	-		-	-	-	271	Inf	Inf	0.0%
6/1	exit lane north	U	N/A	N/A	-		-	-	-	217	Inf	Inf	0.0%
Ped Link: P1	Ffordd Bleddyn	-	N/A	-	D		1	6	-	0	-	4075	0.0%
Ped Link: P2	Cardiff Rd (e)	-	N/A	-	E		1	6	-	0	-	4075	0.0%



Full Input Data And Results

Scenario 10: '2031 PM (with dev)' (FG12: '2031 PM (with dev)', Plan 1: 'Network Control Plan 1')

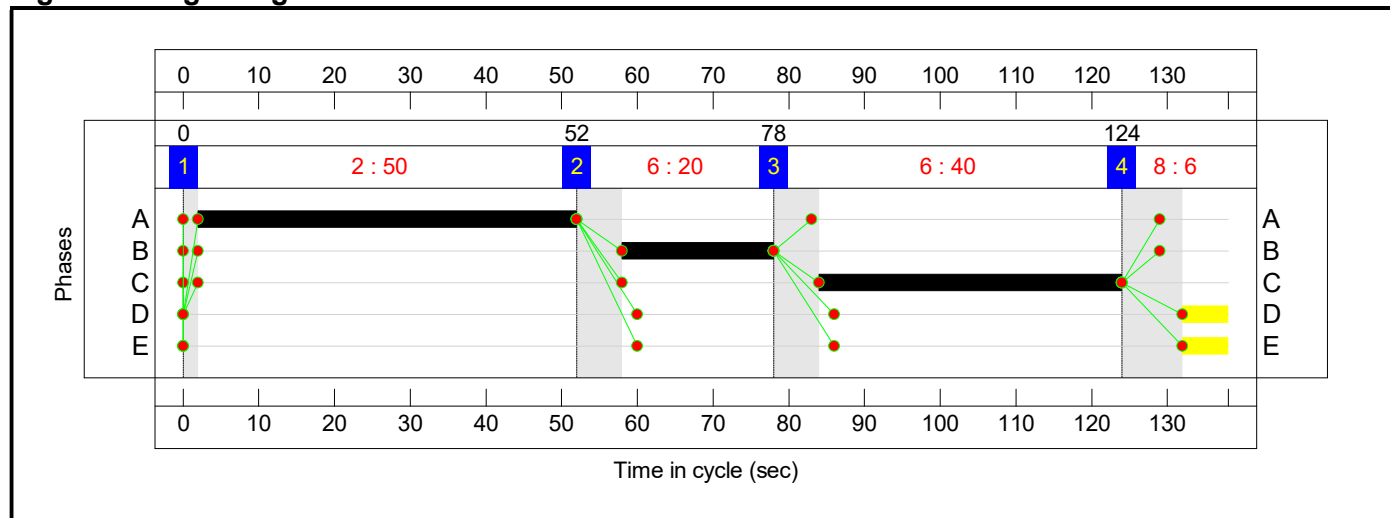
Stage Sequence Diagram



Stage Timings

Stage	1	2	3	4
Duration	50	20	40	6
Change Point	0	52	78	124

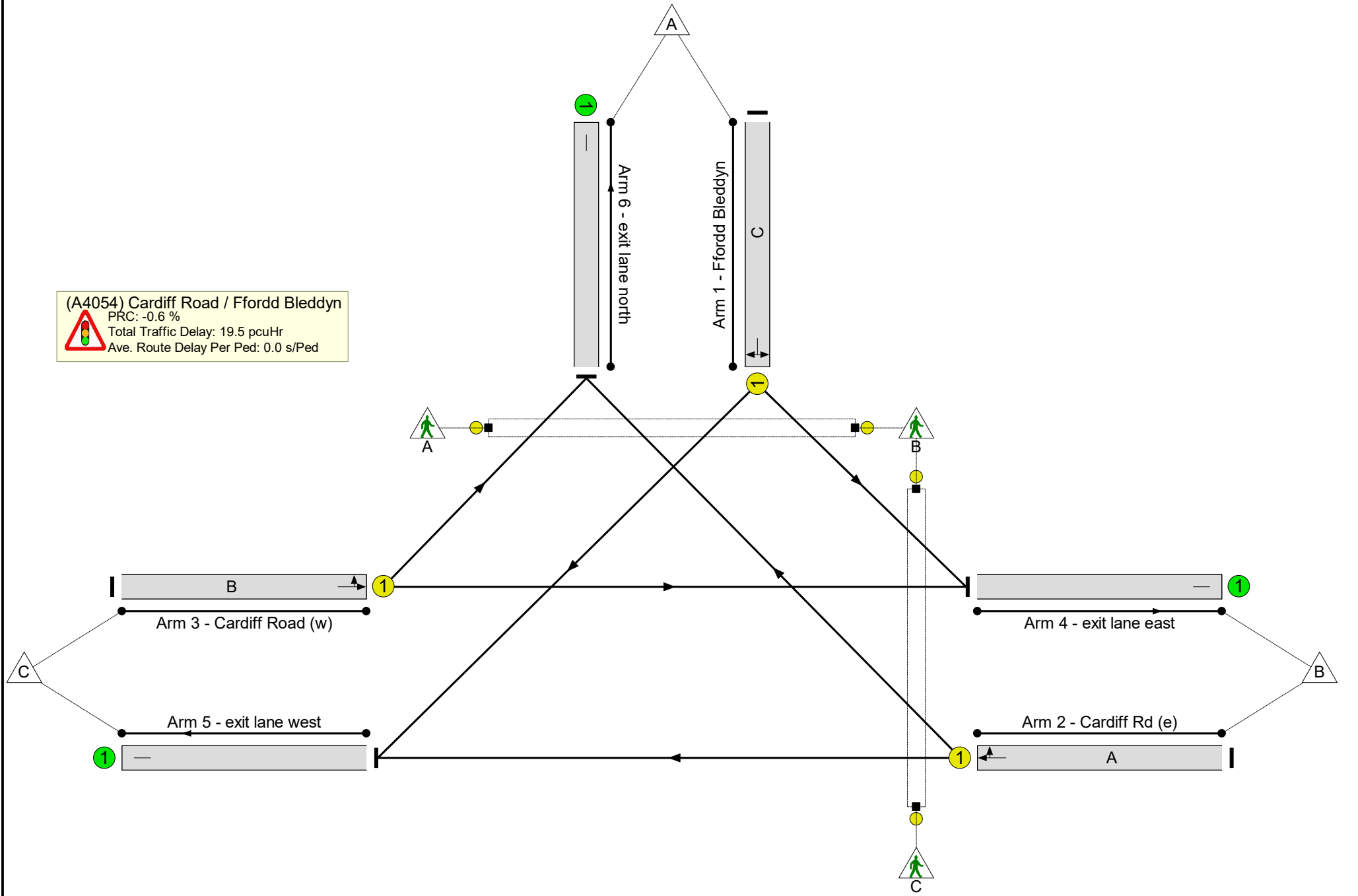
Signal Timings Diagram



Full Input Data And Results  
**Network Layout Diagram**

Full Input Data And Results

(A4054) Cardiff Road / Ffordd Bleddyn  
PRC: -0.6 %  
Total Traffic Delay: 19.5 pcuHr  
Ave. Route Delay Per Ped: 0.0 s/Ped



Full Input Data And Results

**Network Results**

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	-	-	N/A	-	-		-	-	-	-	-	-	90.5%
(A4054) Cardiff Road / Ffordd Bleddyn	-	-	N/A	-	-		-	-	-	-	-	-	90.5%
1/1	Ffordd Bleddyn Left Right	U	N/A	N/A	C		1	40	-	288	1774	527	54.6%
2/1	Cardiff Rd (e) Ahead Right	U	N/A	N/A	A		1	50	-	543	1876	693	78.3%
3/1	Cardiff Road (w) Ahead Left	U	N/A	N/A	B		1	20	-	269	1953	297	90.5%
4/1	exit lane east	U	N/A	N/A	-		-	-	-	527	Inf	Inf	0.0%
5/1	exit lane west	U	N/A	N/A	-		-	-	-	335	Inf	Inf	0.0%
6/1	exit lane north	U	N/A	N/A	-		-	-	-	238	Inf	Inf	0.0%
Ped Link: P1	Ffordd Bleddyn	-	N/A	-	D		1	6	-	0	-	3130	0.0%
Ped Link: P2	Cardiff Rd (e)	-	N/A	-	E		1	6	-	0	-	3130	0.0%



Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
<b>Network</b>	-	-	0	0	0	13.4	6.1	0.0	19.5	-	-	-	-
<b>(A4054) Cardiff Road / Ffordd Bleddyn</b>	-	-	0	0	0	13.4	6.1	0.0	19.5	-	-	-	-
1/1	288	288	-	-	-	3.3	0.6	-	3.9	48.2	9.2	0.6	9.8
2/1	543	543	-	-	-	5.8	1.8	-	7.6	50.3	18.4	1.8	20.2
3/1	269	269	-	-	-	4.3	3.8	-	8.1	107.9	10.1	3.8	13.9
4/1	527	527	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	335	335	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	238	238	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
Ped Link: P1	0	0	-	-	-	-	-	-	0.0	0.0	-	-	0.0
Ped Link: P2	0	0	-	-	-	-	-	-	0.0	0.0	-	-	0.0
<p>C1      PRC for Signalled Lanes (%): -0.6      Total Delay for Signalled Lanes (pcuHr): 19.51      Cycle Time (s): 138  PRC Over All Lanes (%): -0.6      Total Delay Over All Lanes(pcuHr): 19.51</p>													

Junctions 9
ARCADY 9 - Roundabout Module
Version: 9.0.1.4646 [] © Copyright TRL Limited, 2017
For sales and distribution information, program advice and maintenance, contact TRL: Tel: +44 (0)1344 770758 email: software@trl.co.uk Web: http://www.trlsoftware.co.uk
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**Filename:** Mini Roundabout Base YearV5.j9  
**Path:** P:\Cardiff\ERA\ITD\Projects\367590 Cardiff Metro\Task Order 028i Taffs Well Depot\6. Design\Modelling\ARCADY  
**Report generation date:** 08/11/2017 14:50:24

- »Mini Roundabout Base Year - 2017, AM
- »Mini Roundabout Base Year - 2017, PM
- »Mini Roundabout Base Year - 2021, AM
- »Mini Roundabout Base Year - 2021, PM
- »Mini Roundabout Base Year - 2031, AM
- »Mini Roundabout Base Year - 2031, PM

**Summary of junction performance**

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
<b>Mini Roundabout Base Year - 2017</b>								
Arm 1	0.0	3.52	0.02	A	0.0	2.96	0.02	A
Arm 2	0.1	2.80	0.10	A	0.2	3.21	0.17	A
Arm 3	0.6	6.17	0.37	A	0.2	4.58	0.19	A
<b>Mini Roundabout Base Year - 2021</b>								
Arm 1	0.0	3.58	0.02	A	0.0	2.98	0.02	A
Arm 2	0.1	2.81	0.10	A	0.2	3.24	0.18	A
Arm 3	0.7	6.36	0.39	A	0.2	4.64	0.20	A
<b>Mini Roundabout Base Year - 2031</b>								
Arm 1	0.0	3.67	0.03	A	0.0	3.02	0.02	A
Arm 2	0.1	2.84	0.11	A	0.3	3.29	0.19	A
Arm 3	0.8	6.69	0.42	A	0.3	4.73	0.21	A

*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	Mini Roundabout Base Year
Location	
Site number	
Date	07/09/2017
Version	
Status	
Identifier	
Client	
Jobnumber	
Enumerator	MOTTMAC\EGG81001
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	PCU	PCU	perHour	s	-Min	perMin

## Analysis Options

Mini-roundabout model	Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
JUNCTIONS 9			0.85	36.00	20.00

## Demand Set Summary

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2017	AM	2017 AM Base	ONE HOUR	07:15	08:45	15
D2	2017	PM	2017 PM Base	ONE HOUR	16:15	17:45	15
D3	2021	AM	2021 AM Base	ONE HOUR	07:15	08:45	15
D4	2021	PM	2021 PM Base	ONE HOUR	16:15	17:45	15
D5	2031	AM	2031 AM Base	ONE HOUR	07:15	08:45	15
D6	2031	PM	2031 PM Base	ONE HOUR	16:15	17:45	15

## Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Mini Roundabout Base Year	100.000

# Mini Roundabout Base Year - 2017, AM

## Data Errors and Warnings

Severity	Area	Item	Description
Warning	Mini-roundabout		Mini-roundabout appears to have unbalanced flows and may behave like a priority junction; treat results with caution. See User Guide for details.[Arms 2 and 3 have 95% of the total flow for the roundabout for one or more time segments]

## Junction Network

### Junctions

Junction	Name	Junction Type	Junction Delay (s)	Junction LOS
1	Mini Roundabout Base Year	Mini-roundabout	5.12	A

### Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

## Arms

### Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	

### Mini Roundabout Geometry

Arm	Approach road half-width (m)	Minimum approach road half-width (m)	Entry width (m)	Effective flare length (m)	Distance to next arm (m)	Entry corner kerb line distance (m)	Gradient over 50m (%)	Kerbed central island
1	3.47	3.47	4.70	6.3	19.63	20.00	0.0	
2	3.81	3.81	8.06	3.8	17.37	20.00	0.0	
3	4.03	4.03	6.20	5.2	17.79	13.06	0.0	

### Slope / Intercept / Capacity

#### Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.941	1431
2	0.960	1500
3	0.674	982

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

## Traffic Demand

### Demand Set Details

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2017	AM	2017 AM Base	ONE HOUR	07:15	08:45	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 (PCU/hr)	Scaling Factor (%)
1		✓	22	100.000
2		✓	132	100.000
3		✓	327	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To		
		1	2	3
From	1	0	17	5
	2	6	0	126
	3	15	312	0

## Vehicle Mix

### Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	6	6
	2	3	0	5
	3	3	6	0

## Results

### Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
1	0.02	3.52	0.0	A
2	0.10	2.80	0.1	A
3	0.37	6.17	0.6	A

### Main Results for each time segment

#### 07:15 - 07:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	17	234	1211	0.014	17	0.0	3.192	A
2	99	4	1497	0.066	99	0.1	2.702	A
3	246	5	979	0.251	245	0.4	5.182	A

**07:30 - 07:45**

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	20	280	1168	0.017	20	0.0	3.323	A
2	119	4	1496	0.079	119	0.1	2.741	A
3	294	5	978	0.300	294	0.5	5.563	A

**07:45 - 08:00**

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	24	343	1109	0.022	24	0.0	3.518	A
2	145	6	1495	0.097	145	0.1	2.797	A
3	360	7	977	0.368	359	0.6	6.159	A

**08:00 - 08:15**

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	24	344	1108	0.022	24	0.0	3.520	A
2	145	6	1495	0.097	145	0.1	2.797	A
3	360	7	977	0.368	360	0.6	6.171	A

**08:15 - 08:30**

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	20	281	1167	0.017	20	0.0	3.328	A
2	119	4	1496	0.079	119	0.1	2.743	A
3	294	5	978	0.300	295	0.5	5.578	A

**08:30 - 08:45**

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	17	235	1210	0.014	17	0.0	3.197	A
2	99	4	1497	0.066	99	0.1	2.702	A
3	246	5	979	0.251	247	0.4	5.208	A

# Mini Roundabout Base Year - 2017, PM

## Data Errors and Warnings

Severity	Area	Item	Description
Warning	Mini-roundabout		Mini-roundabout appears to have unbalanced flows and may behave like a priority junction; treat results with caution. See User Guide for details.[Arms 2 and 3 have 94% of the total flow for the roundabout for one or more time segments]

## Junction Network

### Junctions

Junction	Name	Junction Type	Junction Delay (s)	Junction LOS
1	Mini Roundabout Base Year	Mini-roundabout	3.74	A

### Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

## Traffic Demand

### Demand Set Details

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2017	PM	2017 PM Base	ONE HOUR	16:15	17:45	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 (PCU/hr)	Scaling Factor (%)
1		✓	21	100.000
2		✓	231	100.000
3		✓	164	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To		
		1	2	3
From	1	0	10	11
	2	11	0	220
	3	8	156	0

## Vehicle Mix

### Heavy Vehicle Percentages

From	To			
	1	2	3	
1	0	3	2	
2	9	0	10	
3	1	1	0	

## Results

### Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
1	0.02	2.96	0.0	A
2	0.17	3.21	0.2	A
3	0.19	4.58	0.2	A

### Main Results for each time segment

#### 16:15 - 16:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	16	117	1321	0.012	16	0.0	2.825	A
2	174	8	1492	0.117	173	0.1	2.999	A
3	123	8	976	0.126	123	0.1	4.257	A

#### 16:30 - 16:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	19	140	1299	0.015	19	0.0	2.880	A
2	208	10	1491	0.139	208	0.2	3.084	A
3	147	10	975	0.151	147	0.2	4.391	A

#### 16:45 - 17:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	23	172	1270	0.018	23	0.0	2.958	A
2	254	12	1489	0.171	254	0.2	3.205	A
3	181	12	974	0.185	180	0.2	4.581	A

#### 17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	23	172	1270	0.018	23	0.0	2.958	A
2	254	12	1489	0.171	254	0.2	3.205	A
3	181	12	974	0.185	181	0.2	4.583	A



17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	19	140	1299	0.015	19	0.0	2.881	A
2	208	10	1491	0.139	208	0.2	3.085	A
3	147	10	975	0.151	148	0.2	4.393	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	16	118	1321	0.012	16	0.0	2.826	A
2	174	8	1492	0.117	174	0.1	3.002	A
3	123	8	976	0.126	124	0.1	4.265	A

# Mini Roundabout Base Year - 2021, AM

## Data Errors and Warnings

Severity	Area	Item	Description
Warning	Mini-roundabout		Mini-roundabout appears to have unbalanced flows and may behave like a priority junction; treat results with caution. See User Guide for details.[Arms 2 and 3 have 95% of the total flow for the roundabout for one or more time segments]

## Junction Network

### Junctions

Junction	Name	Junction Type	Junction Delay (s)	Junction LOS
1	Mini Roundabout Base Year	Mini-roundabout	5.26	A

### Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

## Traffic Demand

### Demand Set Details

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D3	2021	AM	2021 AM Base	ONE HOUR	07:15	08:45	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 (PCU/hr)	Scaling Factor (%)
1		✓	23	100.000
2		✓	139	100.000
3		✓	344	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To		
		1	2	3
From	1	0	18	5
	2	6	0	133
	3	16	328	0

## Vehicle Mix

### Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	6	6
	2	3	0	5
	3	3	6	0

## Results

### Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
1	0.02	3.58	0.0	A
2	0.10	2.81	0.1	A
3	0.39	6.36	0.7	A

### Main Results for each time segment

#### 07:15 - 07:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	17	245	1200	0.014	17	0.0	3.225	A
2	105	4	1497	0.070	104	0.1	2.712	A
3	259	5	979	0.265	257	0.4	5.272	A

#### 07:30 - 07:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	21	294	1154	0.018	21	0.0	3.365	A
2	125	4	1496	0.084	125	0.1	2.754	A
3	309	5	978	0.316	309	0.5	5.688	A

#### 07:45 - 08:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	25	360	1092	0.023	25	0.0	3.576	A
2	153	6	1495	0.102	153	0.1	2.813	A
3	379	7	977	0.387	378	0.7	6.349	A

#### 08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	25	361	1091	0.023	25	0.0	3.578	A
2	153	6	1495	0.102	153	0.1	2.813	A
3	379	7	977	0.387	379	0.7	6.364	A

**08:15 - 08:30**

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	21	296	1153	0.018	21	0.0	3.368	A
2	125	4	1496	0.084	125	0.1	2.754	A
3	309	5	978	0.316	310	0.5	5.707	A

**08:30 - 08:45**

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	17	247	1198	0.014	17	0.0	3.230	A
2	105	4	1497	0.070	105	0.1	2.714	A
3	259	5	979	0.265	259	0.4	5.299	A

# Mini Roundabout Base Year - 2021, PM

## Data Errors and Warnings

Severity	Area	Item	Description
Warning	Mini-roundabout		Mini-roundabout appears to have unbalanced flows and may behave like a priority junction; treat results with caution. See User Guide for details.[Arms 2 and 3 have 94% of the total flow for the roundabout for one or more time segments]

## Junction Network

### Junctions

Junction	Name	Junction Type	Junction Delay (s)	Junction LOS
1	Mini Roundabout Base Year	Mini-roundabout	3.78	A

### Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

## Traffic Demand

### Demand Set Details

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D4	2021	PM	2021 PM Base	ONE HOUR	16:15	17:45	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 (PCU/hr)	Scaling Factor (%)
1		✓	22	100.000
2		✓	242	100.000
3		✓	173	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To		
		1	2	3
From	1	0	11	11
	2	11	0	231
	3	8	165	0

## Vehicle Mix

### Heavy Vehicle Percentages

		To			
		1	2	3	
From	1	0	3	2	
	2	9	0	10	
	3	1	1	0	

## Results

### Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
1	0.02	2.98	0.0	A
2	0.18	3.24	0.2	A
3	0.20	4.64	0.2	A

### Main Results for each time segment

#### 16:15 - 16:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	17	124	1315	0.013	17	0.0	2.841	A
2	182	8	1492	0.122	182	0.2	3.018	A
3	130	8	976	0.133	130	0.2	4.291	A

#### 16:30 - 16:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	20	148	1292	0.015	20	0.0	2.900	A
2	218	10	1491	0.146	217	0.2	3.108	A
3	156	10	975	0.159	155	0.2	4.435	A

#### 16:45 - 17:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	24	181	1260	0.019	24	0.0	2.984	A
2	266	12	1489	0.179	266	0.2	3.237	A
3	190	12	974	0.196	190	0.2	4.639	A

#### 17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	24	182	1260	0.019	24	0.0	2.984	A
2	266	12	1489	0.179	266	0.2	3.237	A
3	190	12	974	0.196	190	0.2	4.641	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	20	149	1291	0.015	20	0.0	2.901	A
2	218	10	1491	0.146	218	0.2	3.111	A
3	156	10	975	0.159	156	0.2	4.439	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	17	124	1314	0.013	17	0.0	2.845	A
2	182	8	1492	0.122	182	0.2	3.021	A
3	130	8	976	0.133	130	0.2	4.300	A

# Mini Roundabout Base Year - 2031, AM

## Data Errors and Warnings

Severity	Area	Item	Description
Warning	Mini-roundabout		Mini-roundabout appears to have unbalanced flows and may behave like a priority junction; treat results with caution. See User Guide for details.[Arms 2 and 3 have 95% of the total flow for the roundabout for one or more time segments]

## Junction Network

### Junctions

Junction	Name	Junction Type	Junction Delay (s)	Junction LOS
1	Mini Roundabout Base Year	Mini-roundabout	5.49	A

### Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

## Traffic Demand

### Demand Set Details

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D5	2031	AM	2031 AM Base	ONE HOUR	07:15	08:45	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 (PCU/hr)	Scaling Factor (%)
1		✓	25	100.000
2		✓	150	100.000
3		✓	370	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To		
		1	2	3
From	1	0	19	6
	2	7	0	143
	3	17	353	0

## Vehicle Mix



### Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	6	6
	2	3	0	5
	3	3	6	0

## Results

### Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
1	0.03	3.67	0.0	A
2	0.11	2.84	0.1	A
3	0.42	6.69	0.8	A

### Main Results for each time segment

#### 07:15 - 07:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	19	264	1183	0.016	19	0.0	3.278	A
2	113	5	1496	0.075	113	0.1	2.729	A
3	279	5	978	0.285	277	0.4	5.419	A

#### 07:30 - 07:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	22	317	1133	0.020	22	0.0	3.435	A
2	135	5	1495	0.090	135	0.1	2.775	A
3	333	6	978	0.340	332	0.5	5.903	A

#### 07:45 - 08:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	28	388	1066	0.026	27	0.0	3.672	A
2	165	7	1494	0.111	165	0.1	2.841	A
3	407	8	977	0.417	407	0.7	6.674	A

#### 08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	28	389	1066	0.026	28	0.0	3.675	A
2	165	7	1494	0.111	165	0.1	2.841	A
3	407	8	977	0.417	407	0.8	6.692	A

**08:15 - 08:30**

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	22	318	1132	0.020	23	0.0	3.438	A
2	135	5	1495	0.090	135	0.1	2.776	A
3	333	6	978	0.340	333	0.6	5.922	A

**08:30 - 08:45**

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	19	266	1181	0.016	19	0.0	3.286	A
2	113	5	1496	0.075	113	0.1	2.730	A
3	279	5	978	0.285	279	0.4	5.455	A

# Mini Roundabout Base Year - 2031, PM

## Data Errors and Warnings

Severity	Area	Item	Description
Warning	Mini-roundabout		Mini-roundabout appears to have unbalanced flows and may behave like a priority junction; treat results with caution. See User Guide for details.[Arms 2 and 3 have 94% of the total flow for the roundabout for one or more time segments]

## Junction Network

### Junctions

Junction	Name	Junction Type	Junction Delay (s)	Junction LOS
1	Mini Roundabout Base Year	Mini-roundabout	3.85	A

### Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

## Traffic Demand

### Demand Set Details

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D6	2031	PM	2031 PM Base	ONE HOUR	16:15	17:45	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 (PCU/hr)	Scaling Factor (%)
1		✓	24	100.000
2		✓	260	100.000
3		✓	186	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To		
		1	2	3
From	1	0	12	12
	2	12	0	248
	3	9	177	0

## Vehicle Mix

### Heavy Vehicle Percentages

		To			
		1	2	3	
From	1	0	3	2	
	2	9	0	10	
	3	1	1	0	

## Results

### Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
1	0.02	3.02	0.0	A
2	0.19	3.29	0.3	A
3	0.21	4.73	0.3	A

### Main Results for each time segment

#### 16:15 - 16:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	18	133	1306	0.014	18	0.0	2.863	A
2	196	9	1492	0.131	195	0.2	3.051	A
3	140	9	976	0.144	139	0.2	4.343	A

#### 16:30 - 16:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	22	159	1282	0.017	22	0.0	2.927	A
2	234	11	1490	0.157	234	0.2	3.150	A
3	167	11	975	0.172	167	0.2	4.500	A

#### 16:45 - 17:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	26	195	1248	0.021	26	0.0	3.019	A
2	286	13	1488	0.192	286	0.3	3.294	A
3	205	13	973	0.210	205	0.3	4.730	A

#### 17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	26	195	1248	0.021	26	0.0	3.020	A
2	286	13	1488	0.192	286	0.3	3.294	A
3	205	13	973	0.210	205	0.3	4.732	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	22	159	1281	0.017	22	0.0	2.930	A
2	234	11	1490	0.157	234	0.2	3.153	A
3	167	11	975	0.172	167	0.2	4.507	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	18	133	1306	0.014	18	0.0	2.867	A
2	196	9	1492	0.131	196	0.2	3.056	A
3	140	9	976	0.144	140	0.2	4.353	A

Junctions 9
ARCADY 9 - Roundabout Module
Version: 9.0.1.4646 [] © Copyright TRL Limited, 2017
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**Filename:** Mini Roundabout Future Development YearV5.j9  
**Path:** P:\Cardiff\ERA\ITD\Projects\367590 Cardiff Metro\Task Order 028i Taffs Well Depot\6. Design\Modelling\ARCADY  
**Report generation date:** 08/11/2017 15:13:24

- »with Development - 2021, AM
- »with Development - 2021, PM
- »with Development - 2031, AM
- »with Development - 2031, PM

**Summary of junction performance**

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
<b>with Development - 2021</b>								
Arm A	0.0	6.18	0.04	A	0.0	5.03	0.03	A
Arm B	0.1	2.87	0.10	A	0.2	3.31	0.18	A
Arm C	0.7	6.69	0.40	A	0.3	4.79	0.20	A
Arm D	0.0	0.00	0.00	A	0.0	0.00	0.00	A
<b>with Development - 2031</b>								
Arm A	0.0	6.38	0.04	A	0.0	5.10	0.04	A
Arm B	0.1	2.89	0.11	A	0.3	3.37	0.20	A
Arm C	0.8	7.06	0.43	A	0.3	4.88	0.22	A
Arm D	0.0	0.00	0.00	A	0.0	0.00	0.00	A

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	(untitled)
Location	
Site number	
Date	06/09/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	MOTTMAC\EGG81001
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	PCU	PCU	perHour	s	-Min	perMin

## Analysis Options

Mini-roundabout model	Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
JUNCTIONS 9			0.85	36.00	20.00

## Demand Set Summary

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2021	AM	2021 AM Development	ONE HOUR	07:15	08:45	15
D2	2021	PM	2021 PM Development	ONE HOUR	16:15	17:45	15
D3	2031	AM	2031 AM Development	ONE HOUR	07:15	08:45	15
D4	2031	PM		ONE HOUR	16:15	17:45	15

## Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	with Development	100.000

# with Development - 2021, AM

## Data Errors and Warnings

Severity	Area	Item	Description
Warning	Mini-roundabout		Mini-roundabout appears to have unbalanced flows and may behave like a priority junction; treat results with caution. See User Guide for details.[Arms B and C have 95% of the total flow for the roundabout for one or more time segments]

## Junction Network

### Junctions

Junction	Name	Junction Type	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout	5.62	A

### Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

## Arms

### Arms

Arm	Name	Description
A	untitled	
B	untitled	
C	untitled	
D	untitled	

### Mini Roundabout Geometry

Arm	Approach road half-width (m)	Minimum approach road half-width (m)	Entry width (m)	Effective flare length (m)	Distance to next arm (m)	Entry corner kerb line distance (m)	Gradient over 50m (%)	Kerbed central island
A	3.70	3.70	4.48	1.3	12.21	7.49	0.0	
B	3.51	3.51	5.57	4.1	16.30	20.00	0.0	
C	4.03	3.00	6.33	5.2	15.88	10.66	0.0	
D	3.79	3.79	4.39	0.7	12.80	5.80	0.0	

### Slope / Intercept / Capacity

#### Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
A	0.627	872
B	0.943	1476
C	0.634	960
D	0.626	956

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



## Traffic Demand

### Demand Set Details

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2021	AM	2021 AM Development	ONE HOUR	07:15	08:45	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 (PCU/hr)	Scaling Factor (%)
A		✓	23	100.000
B		✓	140	100.000
C		✓	350	100.000
D		✓	0	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0	18	5	0
	B	6	0	133	1
	C	16	333	0	1
	D	0	0	0	0

## Vehicle Mix

### Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	6	6	0
	B	3	0	5	1
	C	3	6	0	1
	D	0	1	1	0

## Results

### Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
A	0.04	6.18	0.0	A
B	0.10	2.87	0.1	A
C	0.40	6.69	0.7	A
D	0.00	0.00	0.0	A

## Main Results for each time segment

### 07:15 - 07:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	17	249	716	0.024	17	0.0	5.460	A
B	105	4	1473	0.072	105	0.1	2.760	A
C	263	5	956	0.276	262	0.4	5.476	A
D	0	266	790	0.000	0	0.0	0.000	A

### 07:30 - 07:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	21	299	685	0.030	21	0.0	5.745	A
B	126	4	1472	0.085	126	0.1	2.804	A
C	315	6	956	0.329	314	0.5	5.937	A
D	0	319	756	0.000	0	0.0	0.000	A

### 07:45 - 08:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	25	366	643	0.039	25	0.0	6.179	A
B	154	5	1471	0.105	154	0.1	2.866	A
C	385	8	955	0.404	385	0.7	6.673	A
D	0	390	712	0.000	0	0.0	0.000	A

### 08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	25	367	642	0.039	25	0.0	6.183	A
B	154	6	1471	0.105	154	0.1	2.866	A
C	385	8	955	0.404	385	0.7	6.692	A
D	0	391	711	0.000	0	0.0	0.000	A

### 08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	21	300	684	0.030	21	0.0	5.752	A
B	126	5	1472	0.085	126	0.1	2.806	A
C	315	6	956	0.329	315	0.5	5.958	A
D	0	320	756	0.000	0	0.0	0.000	A

### 08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	17	251	715	0.024	17	0.0	5.471	A
B	105	4	1473	0.072	105	0.1	2.763	A
C	263	5	956	0.276	264	0.4	5.509	A
D	0	268	788	0.000	0	0.0	0.000	A

# with Development - 2021, PM

## Data Errors and Warnings

Severity	Area	Item	Description
Warning	Mini-roundabout		Mini-roundabout appears to have unbalanced flows and may behave like a priority junction; treat results with caution. See User Guide for details.[Arms B and C have 94% of the total flow for the roundabout for one or more time segments]

## Junction Network

### Junctions

Junction	Name	Junction Type	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout	3.98	A

### Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

## Traffic Demand

### Demand Set Details

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2021	PM	2021 PM Development	ONE HOUR	16:15	17:45	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 (PCU/hr)	Scaling Factor (%)
A		✓	22	100.000
B		✓	246	100.000
C		✓	174	100.000
D		✓	1	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0	11	11	0
	B	11	0	234	1
	C	8	165	0	1
	D	0	0	1	0

## Vehicle Mix

### Heavy Vehicle Percentages

	To				
	A	B	C	D	
From	A	0	3	2	0
	B	9	0	10	1
	C	1	1	0	1
	D	0	1	1	0

## Results

### Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
A	0.03	5.03	0.0	A
B	0.18	3.31	0.2	A
C	0.20	4.79	0.3	A
D	0.00	0.00	0.0	A

### Main Results for each time segment

#### 16:15 - 16:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	17	124	795	0.021	16	0.0	4.740	A
B	185	8	1469	0.126	185	0.2	3.080	A
C	131	9	954	0.137	130	0.2	4.413	A
D	0	138	870	0.000	0	0.0	0.000	A

#### 16:30 - 16:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	20	148	779	0.025	20	0.0	4.857	A
B	221	10	1467	0.151	221	0.2	3.175	A
C	156	11	953	0.164	156	0.2	4.565	A
D	0	165	852	0.000	0	0.0	0.000	A

#### 16:45 - 17:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	24	181	759	0.032	24	0.0	5.024	A
B	271	12	1465	0.185	271	0.2	3.312	A
C	192	13	951	0.201	191	0.3	4.784	A
D	0	202	829	0.000	0	0.0	0.000	A

#### 17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	24	182	758	0.032	24	0.0	5.025	A
B	271	12	1465	0.185	271	0.2	3.313	A
C	192	13	951	0.201	192	0.3	4.786	A
D	0	203	829	0.000	0	0.0	0.000	A

**17:15 - 17:30**

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	20	149	779	0.025	20	0.0	4.860	A
B	221	10	1467	0.151	221	0.2	3.178	A
C	156	11	953	0.164	157	0.2	4.570	A
D	0	166	852	0.000	0	0.0	0.000	A

**17:30 - 17:45**

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	17	124	794	0.021	17	0.0	4.744	A
B	185	8	1469	0.126	185	0.2	3.083	A
C	131	9	954	0.137	131	0.2	4.420	A
D	0	139	869	0.000	0	0.0	0.000	A

# with Development - 2031, AM

## Data Errors and Warnings

Severity	Area	Item	Description
Warning	Mini-roundabout		Mini-roundabout appears to have unbalanced flows and may behave like a priority junction; treat results with caution. See User Guide for details.[Arms B and C have 95% of the total flow for the roundabout for one or more time segments]

## Junction Network

### Junctions

Junction	Name	Junction Type	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout	5.89	A

### Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

## Traffic Demand

### Demand Set Details

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D3	2031	AM	2031 AM Development	ONE HOUR	07:15	08:45	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 (PCU/hr)	Scaling Factor (%)
A		✓	25	100.000
B		✓	151	100.000
C		✓	376	100.000
D		✓	0	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0	19	6	0
	B	7	0	143	1
	C	17	358	0	1
	D	0	0	0	0

## Vehicle Mix

### Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	6	6	0
	B	3	0	5	1
	C	3	6	0	1
	D	0	1	1	0

## Results

### Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
A	0.04	6.38	0.0	A
B	0.11	2.89	0.1	A
C	0.43	7.06	0.8	A
D	0.00	0.00	0.0	A

### Main Results for each time segment

#### 07:15 - 07:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	19	268	704	0.027	19	0.0	5.566	A
B	114	4	1472	0.077	113	0.1	2.778	A
C	283	6	956	0.296	281	0.4	5.635	A
D	0	286	777	0.000	0	0.0	0.000	A

#### 07:30 - 07:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	22	321	671	0.034	22	0.0	5.885	A
B	136	5	1471	0.092	136	0.1	2.826	A
C	338	7	955	0.354	337	0.6	6.165	A
D	0	343	741	0.000	0	0.0	0.000	A

#### 07:45 - 08:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	28	393	626	0.044	27	0.0	6.379	A
B	166	7	1470	0.113	166	0.1	2.895	A
C	414	9	954	0.434	413	0.8	7.033	A
D	0	420	693	0.000	0	0.0	0.000	A

#### 08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	28	394	625	0.044	28	0.0	6.385	A
B	166	7	1470	0.113	166	0.1	2.895	A
C	414	9	954	0.434	414	0.8	7.055	A
D	0	421	692	0.000	0	0.0	0.000	A

**08:15 - 08:30**

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	22	323	670	0.034	23	0.0	5.896	A
B	136	5	1471	0.092	136	0.1	2.826	A
C	338	7	955	0.354	339	0.6	6.193	A
D	0	344	740	0.000	0	0.0	0.000	A

**08:30 - 08:45**

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	19	270	703	0.027	19	0.0	5.580	A
B	114	5	1472	0.077	114	0.1	2.779	A
C	283	6	956	0.296	284	0.4	5.675	A
D	0	288	775	0.000	0	0.0	0.000	A



# with Development - 2031, PM

## Data Errors and Warnings

Severity	Area	Item	Description
Warning	Mini-roundabout		Mini-roundabout appears to have unbalanced flows and may behave like a priority junction; treat results with caution. See User Guide for details.[Arms B and C have 94% of the total flow for the roundabout for one or more time segments]

## Junction Network

### Junctions

Junction	Name	Junction Type	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout	4.05	A

### Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	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	2031	PM	ONE HOUR	16:15	17:45	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 (PCU/hr)	Scaling Factor (%)
A		✓	24	100.000
B		✓	264	100.000
C		✓	187	100.000
D		✓	1	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0	12	12	0
	B	12	0	251	1
	C	9	177	0	1
	D	0	0	1	0

## Vehicle Mix

### Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	3	2	0
	B	9	0	10	1
	C	1	1	0	1
	D	0	1	1	0

## Results

### Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
A	0.04	5.10	0.0	A
B	0.20	3.37	0.3	A
C	0.22	4.88	0.3	A
D	0.00	0.00	0.0	A

### Main Results for each time segment

#### 16:15 - 16:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	18	133	789	0.023	18	0.0	4.784	A
B	199	9	1468	0.135	198	0.2	3.114	A
C	141	10	953	0.148	140	0.2	4.467	A
D	0	148	863	0.000	0	0.0	0.000	A

#### 16:30 - 16:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	22	159	773	0.028	22	0.0	4.912	A
B	237	11	1466	0.162	237	0.2	3.219	A
C	168	12	952	0.177	168	0.2	4.635	A
D	0	178	845	0.000	0	0.0	0.000	A

#### 16:45 - 17:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	26	195	750	0.035	26	0.0	5.097	A
B	291	13	1464	0.199	290	0.3	3.371	A
C	206	14	950	0.217	206	0.3	4.880	A
D	0	218	820	0.000	0	0.0	0.000	A

#### 17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	26	195	750	0.035	26	0.0	5.098	A
B	291	13	1464	0.199	291	0.3	3.371	A
C	206	14	950	0.217	206	0.3	4.882	A
D	0	218	819	0.000	0	0.0	0.000	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	22	159	772	0.028	22	0.0	4.916	A
B	237	11	1466	0.162	238	0.2	3.223	A
C	168	12	952	0.177	168	0.2	4.641	A
D	0	178	844	0.000	0	0.0	0.000	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	18	133	789	0.023	18	0.0	4.788	A
B	199	9	1468	0.135	199	0.2	3.118	A
C	141	10	953	0.148	141	0.2	4.477	A
D	0	149	862	0.000	0	0.0	0.000	A

Junctions 9
PICADY 9 - Priority Intersection Module
Version: 9.0.1.4646 [] © Copyright TRL Limited, 2017
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**Filename:** Park and Ride AccessV4.j9  
**Path:** P:\Cardiff\ERA\ITD\Projects\367590 Cardiff Metro\Task Order 028i Taffs Well Depot\6. Design\Modelling\PICADY\P&R  
**Report generation date:** 08/11/2017 13:05:59

- »Existing - 2017, AM
- »Existing - 2017, PM
- »Existing - 2021, AM
- »Existing - 2021, PM
- »Existing - 2031, AM
- »Existing - 2031, PM

**Summary of junction performance**

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
<b>Existing - 2017</b>								
Stream B-AC	0.0	0.00	0.00	A	0.0	7.79	0.04	A
Stream C-AB	0.0	5.81	0.02	A	0.0	5.48	0.00	A
<b>Existing - 2021</b>								
Stream B-AC	0.0	0.00	0.00	A	0.0	7.93	0.05	A
Stream C-AB	0.0	5.80	0.02	A	0.0	5.46	0.00	A
<b>Existing - 2031</b>								
Stream B-AC	0.0	0.00	0.00	A	0.1	7.99	0.05	A
Stream C-AB	0.0	5.79	0.02	A	0.0	5.43	0.00	A

*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	(untitled)
Location	
Site number	
Date	28/09/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	MOTTMACVART49719
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	PCU	PCU	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	2017	AM	ONE HOUR	07:15	08:45	15
D2	2017	PM	ONE HOUR	16:15	17:45	15
D3	2021	AM	ONE HOUR	07:15	08:45	15
D4	2021	PM	ONE HOUR	16:15	17:45	15
D5	2031	AM	ONE HOUR	07:15	08:45	15
D6	2031	PM	ONE HOUR	16:15	17:45	15

## Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Existing	100.000

# Existing - 2017, AM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	P&R Access / Fordd Bleddyn / Depot Access	T-Junction	Two-way	0.13	A

### Junction Network Options

Driving side	Lighting
Left	Normal/unknown

## Arms

### Arms

Arm	Name	Description	Arm type
A	Fordd Bleddyn (n)		Major
B	Car Park Access		Minor
C	Fordd Bleddyn (s)		Major

### Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	7.00			70.0	✓	0.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

### Minor Arm Geometry

Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
B	One lane	2.75	50	45

## Slope / Intercept / Capacity

### Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	503	0.088	0.222	0.139	0.316
1	B-C	636	0.093	0.236	-	-
1	C-B	615	0.228	0.228	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

## 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	2017	AM	ONE HOUR	07:15	08:45	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 (PCU/hr)	Scaling Factor (%)
A		✓	350	100.000
B		✓	2	100.000
C		✓	160	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To		
		A	B	C
From	A	0	27	323
	B	1	0	1
	C	151	9	0

## Vehicle Mix

### Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	11
	B	0	0	0
	C	4	0	0

## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.00	0.00	0.0	A
C-AB	0.02	5.81	0.0	A
C-A				
A-B				
A-C				

## Main Results for each time segment

### 07:15 - 07:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0	492	0.000	0	0.0	0.000	A
C-AB	8	633	0.013	8	0.0	5.800	A
C-A	112			112			
A-B	20			20			
A-C	243			243			

### 07:30 - 07:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0	479	0.000	0	0.0	0.000	A
C-AB	10	638	0.016	10	0.0	5.781	A
C-A	134			134			
A-B	24			24			
A-C	290			290			

### 07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0	460	0.000	0	0.0	0.000	A
C-AB	13	644	0.021	13	0.0	5.757	A
C-A	163			163			
A-B	30			30			
A-C	356			356			

### 08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0	460	0.000	0	0.0	0.000	A
C-AB	13	644	0.021	13	0.0	5.762	A
C-A	163			163			
A-B	30			30			
A-C	356			356			

### 08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0	479	0.000	0	0.0	0.000	A
C-AB	10	638	0.016	10	0.0	5.794	A
C-A	134			134			
A-B	24			24			
A-C	290			290			

### 08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0	492	0.000	0	0.0	0.000	A
C-AB	8	633	0.013	8	0.0	5.807	A
C-A	112			112			
A-B	20			20			
A-C	243			243			



# Existing - 2017, PM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	P&R Access / Fordd Bleddyn / Depot Access	T-Junction	Two-way	0.38	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	2017	PM	ONE HOUR	16:15	17:45	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 (PCU/hr)	Scaling Factor (%)
A		✓	215	100.000
B		✓	19	100.000
C		✓	197	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To		
		A	B	C
From	A	0	0	215
	B	10	0	9
	C	195	2	0

## Vehicle Mix

### Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	3
	B	0	0	0
	C	13	0	0

## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.04	7.79	0.0	A
C-AB	0.00	5.48	0.0	A
C-A				
A-B				
A-C				

### Main Results for each time segment

#### 16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	14	507	0.028	14	0.0	7.300	A
C-AB	2	677	0.003	2	0.0	5.465	A
C-A	146			146			
A-B	0			0			
A-C	162			162			

#### 16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	17	497	0.034	17	0.0	7.497	A
C-AB	2	690	0.004	2	0.0	5.380	A
C-A	175			175			
A-B	0			0			
A-C	193			193			

#### 16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	21	483	0.043	21	0.0	7.787	A
C-AB	3	708	0.004	3	0.0	5.275	A
C-A	214			214			
A-B	0			0			
A-C	237			237			

#### 17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	21	483	0.043	21	0.0	7.787	A
C-AB	3	708	0.004	3	0.0	5.291	A
C-A	214			214			
A-B	0			0			
A-C	237			237			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	17	497	0.034	17	0.0	7.499	A
C-AB	2	690	0.004	2	0.0	5.409	A
C-A	175			175			
A-B	0			0			
A-C	193			193			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	14	507	0.028	14	0.0	7.303	A
C-AB	2	677	0.003	2	0.0	5.480	A
C-A	146			146			
A-B	0			0			
A-C	162			162			

# Existing - 2021, AM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	P&R Access / Fordd Bleddyn / Depot Access	T-Junction	Two-way	0.13	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	2021	AM	ONE HOUR	07:15	08:45	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 (PCU/hr)	Scaling Factor (%)
A		✓	369	100.000
B		✓	2	100.000
C		✓	168	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To		
		A	B	C
From	A	0	28	341
	B	1	0	1
	C	159	9	0

## Vehicle Mix

### Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	11
	B	0	0	0
	C	4	0	0

## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.00	0.00	0.0	A
C-AB	0.02	5.80	0.0	A
C-A				
A-B				
A-C				

### Main Results for each time segment

#### 07:15 - 07:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0	489	0.000	0	0.0	0.000	A
C-AB	8	634	0.013	8	0.0	5.792	A
C-A	118			118			
A-B	21			21			
A-C	257			257			

#### 07:30 - 07:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0	474	0.000	0	0.0	0.000	A
C-AB	10	639	0.016	10	0.0	5.772	A
C-A	141			141			
A-B	25			25			
A-C	307			307			

#### 07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0	454	0.000	0	0.0	0.000	A
C-AB	14	646	0.021	14	0.0	5.744	A
C-A	171			171			
A-B	31			31			
A-C	375			375			

#### 08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0	454	0.000	0	0.0	0.000	A
C-AB	14	646	0.021	14	0.0	5.752	A
C-A	171			171			
A-B	31			31			
A-C	375			375			

**08:15 - 08:30**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0	474	0.000	0	0.0	0.000	A
C-AB	10	639	0.016	10	0.0	5.782	A
C-A	141			141			
A-B	25			25			
A-C	307			307			

**08:30 - 08:45**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0	489	0.000	0	0.0	0.000	A
C-AB	8	634	0.013	8	0.0	5.798	A
C-A	118			118			
A-B	21			21			
A-C	257			257			

# Existing - 2021, PM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	P&R Access / Fordd Bleddyn / Depot Access	T-Junction	Two-way	0.38	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	2021	PM	ONE HOUR	16:15	17:45	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 (PCU/hr)	Scaling Factor (%)
A		✓	226	100.000
B		✓	20	100.000
C		✓	207	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To		
		A	B	C
From	A	0	0	226
	B	11	0	9
	C	205	2	0

## Vehicle Mix

### Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	3
	B	0	0	0
	C	13	0	0

## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.05	7.93	0.0	A
C-AB	0.00	5.46	0.0	A
C-A				
A-B				
A-C				

### Main Results for each time segment

#### 16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	15	501	0.030	15	0.0	7.402	A
C-AB	2	681	0.003	2	0.0	5.445	A
C-A	154			154			
A-B	0			0			
A-C	170			170			

#### 16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	18	490	0.037	18	0.0	7.618	A
C-AB	2	694	0.004	2	0.0	5.355	A
C-A	184			184			
A-B	0			0			
A-C	203			203			

#### 16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	22	476	0.046	22	0.0	7.934	A
C-AB	3	714	0.005	3	0.0	5.245	A
C-A	225			225			
A-B	0			0			
A-C	249			249			

#### 17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	22	476	0.046	22	0.0	7.934	A
C-AB	3	714	0.005	3	0.0	5.259	A
C-A	225			225			
A-B	0			0			
A-C	249			249			



17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	18	490	0.037	18	0.0	7.622	A
C-AB	2	694	0.004	2	0.0	5.387	A
C-A	184			184			
A-B	0			0			
A-C	203			203			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	15	501	0.030	15	0.0	7.406	A
C-AB	2	681	0.003	2	0.0	5.462	A
C-A	154			154			
A-B	0			0			
A-C	170			170			

# Existing - 2031, AM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	P&R Access / Fordd Bleddyn / Depot Access	T-Junction	Two-way	0.13	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)
D5	2031	AM	ONE HOUR	07:15	08:45	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 (PCU/hr)	Scaling Factor (%)
A		✓	397	100.000
B		✓	2	100.000
C		✓	181	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To		
		A	B	C
From	A	0	31	366
	B	1	0	1
	C	171	10	0

## Vehicle Mix

### Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	11
	B	0	0	0
	C	4	0	0

## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.00	0.00	0.0	A
C-AB	0.02	5.79	0.0	A
C-A				
A-B				
A-C				

### Main Results for each time segment

#### 07:15 - 07:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0	483	0.000	0	0.0	0.000	A
C-AB	9	636	0.015	9	0.0	5.789	A
C-A	127			127			
A-B	23			23			
A-C	276			276			

#### 07:30 - 07:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0	468	0.000	0	0.0	0.000	A
C-AB	12	641	0.018	12	0.0	5.767	A
C-A	151			151			
A-B	28			28			
A-C	329			329			

#### 07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0	446	0.000	0	0.0	0.000	A
C-AB	16	649	0.024	16	0.0	5.738	A
C-A	184			184			
A-B	34			34			
A-C	403			403			

#### 08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0	446	0.000	0	0.0	0.000	A
C-AB	16	649	0.024	16	0.0	5.743	A
C-A	184			184			
A-B	34			34			
A-C	403			403			

**08:15 - 08:30**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0	468	0.000	0	0.0	0.000	A
C-AB	12	641	0.018	12	0.0	5.778	A
C-A	151			151			
A-B	28			28			
A-C	329			329			

**08:30 - 08:45**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0	483	0.000	0	0.0	0.000	A
C-AB	9	636	0.015	9	0.0	5.794	A
C-A	127			127			
A-B	23			23			
A-C	276			276			

# Existing - 2031, PM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	P&R Access / Fordd Bleddyn / Depot Access	T-Junction	Two-way	0.38	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)
D6	2031	PM	ONE HOUR	16:15	17:45	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 (PCU/hr)	Scaling Factor (%)
A		✓	243	100.000
B		✓	21	100.000
C		✓	222	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To		
		A	B	C
From	A	0	0	243
	B	11	0	10
	C	220	2	0

## Vehicle Mix

### Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	3
	B	0	0	0
	C	13	0	0

## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.05	7.99	0.1	A
C-AB	0.00	5.43	0.0	A
C-A				
A-B				
A-C				

### Main Results for each time segment

#### 16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	16	501	0.032	16	0.0	7.417	A
C-AB	2	686	0.003	2	0.0	5.414	A
C-A	165			165			
A-B	0			0			
A-C	183			183			

#### 16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	19	490	0.039	19	0.0	7.647	A
C-AB	3	700	0.004	3	0.0	5.319	A
C-A	197			197			
A-B	0			0			
A-C	218			218			

#### 16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	23	474	0.049	23	0.1	7.986	A
C-AB	3	721	0.005	3	0.0	5.201	A
C-A	241			241			
A-B	0			0			
A-C	268			268			

#### 17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	23	474	0.049	23	0.1	7.988	A
C-AB	3	721	0.005	3	0.0	5.217	A
C-A	241			241			
A-B	0			0			
A-C	268			268			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	19	490	0.039	19	0.0	7.652	A
C-AB	3	700	0.004	3	0.0	5.350	A
C-A	197			197			
A-B	0			0			
A-C	218			218			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	16	501	0.032	16	0.0	7.424	A
C-AB	2	686	0.003	2	0.0	5.432	A
C-A	165			165			
A-B	0			0			
A-C	183			183			

Junctions 9
PICADY 9 - Priority Intersection Module
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**Filename:** Park and Ride Access with Development V4.j9  
**Path:** P:\Cardiff\ERA\ITD\Projects\367590 Cardiff Metro\Task Order 028i Taffs Well Depot\6. Design\Modelling\PICADY\P&R  
**Report generation date:** 08/11/2017 13:13:05

- »with Development - 2017, AM
- »with Development - 2017, PM
- »with Development - 2021, AM
- »with Development - 2021, PM
- »with Development - 2031, AM
- »with Development - 2031, PM

**Summary of junction performance**

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
<b>with Development - 2017</b>								
Stream B-AC	0.0	0.00	0.00	A	0.0	7.80	0.04	A
Stream C-AB	0.0	5.81	0.02	A	0.0	5.47	0.00	A
<b>with Development - 2021</b>								
Stream B-AC	0.0	0.00	0.00	A	0.0	7.95	0.05	A
Stream C-AB	0.0	5.81	0.02	A	0.0	5.45	0.00	A
<b>with Development - 2031</b>								
Stream B-AC	0.0	0.00	0.00	A	0.1	8.00	0.05	A
Stream C-AB	0.0	5.80	0.02	A	0.0	5.42	0.00	A

*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	(untitled)
Location	
Site number	
Date	28/09/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	MOTTMACVART49719
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	PCU	PCU	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	2017	AM	ONE HOUR	07:15	08:45	15
D2	2017	PM	ONE HOUR	16:15	17:45	15
D3	2021	AM	ONE HOUR	07:15	08:45	15
D4	2021	PM	ONE HOUR	16:15	17:45	15
D5	2031	AM	ONE HOUR	07:15	08:45	15
D6	2031	PM	ONE HOUR	16:15	17:45	15

## Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	with Development	100.000

# with Development - 2017, AM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	P&R Access / Fordd Bleddyn / Depot Access	T-Junction	Two-way	0.13	A

### Junction Network Options

Driving side	Lighting
Left	Normal/unknown

## Arms

### Arms

Arm	Name	Description	Arm type
A	Fordd Bleddyn (n)		Major
B	Car Park Access		Minor
C	Fordd Bleddyn (s)		Major

### Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	7.00			70.0	✓	0.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

### Minor Arm Geometry

Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
B	One lane	2.75	50	45

## Slope / Intercept / Capacity

### Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	503	0.088	0.222	0.139	0.316
1	B-C	636	0.093	0.236	-	-
1	C-B	615	0.228	0.228	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

## 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	2017	AM	ONE HOUR	07:15	08:45	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 (PCU/hr)	Scaling Factor (%)
A		✓	356	100.000
B		✓	2	100.000
C		✓	160	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To		
		A	B	C
From	A	0	27	329
	B	1	0	1
	C	151	9	0

## Vehicle Mix

### Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	11
	B	0	0	0
	C	4	0	0

## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.00	0.00	0.0	A
C-AB	0.02	5.81	0.0	A
C-A				
A-B				
A-C				

## Main Results for each time segment

### 07:15 - 07:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0	491	0.000	0	0.0	0.000	A
C-AB	8	632	0.013	8	0.0	5.809	A
C-A	112			112			
A-B	20			20			
A-C	248			248			

### 07:30 - 07:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0	477	0.000	0	0.0	0.000	A
C-AB	10	637	0.016	10	0.0	5.792	A
C-A	134			134			
A-B	24			24			
A-C	296			296			

### 07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0	458	0.000	0	0.0	0.000	A
C-AB	13	643	0.021	13	0.0	5.770	A
C-A	163			163			
A-B	30			30			
A-C	362			362			

### 08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0	458	0.000	0	0.0	0.000	A
C-AB	13	643	0.021	13	0.0	5.775	A
C-A	163			163			
A-B	30			30			
A-C	362			362			

### 08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0	477	0.000	0	0.0	0.000	A
C-AB	10	637	0.016	10	0.0	5.804	A
C-A	134			134			
A-B	24			24			
A-C	296			296			

### 08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0	491	0.000	0	0.0	0.000	A
C-AB	8	632	0.013	8	0.0	5.814	A
C-A	112			112			
A-B	20			20			
A-C	248			248			

# with Development - 2017, PM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	P&R Access / Fordd Bleddyn / Depot Access	T-Junction	Two-way	0.37	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	2017	PM	ONE HOUR	16:15	17:45	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 (PCU/hr)	Scaling Factor (%)
A		✓	216	100.000
B		✓	19	100.000
C		✓	200	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To		
		A	B	C
From	A	0	0	216
	B	10	0	9
	C	198	2	0

## Vehicle Mix

### Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	3
	B	0	0	0
	C	13	0	0

## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.04	7.80	0.0	A
C-AB	0.00	5.47	0.0	A
C-A				
A-B				
A-C				

### Main Results for each time segment

#### 16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	14	507	0.028	14	0.0	7.305	A
C-AB	2	679	0.003	2	0.0	5.456	A
C-A	149			149			
A-B	0			0			
A-C	163			163			

#### 16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	17	497	0.034	17	0.0	7.505	A
C-AB	2	692	0.004	2	0.0	5.369	A
C-A	177			177			
A-B	0			0			
A-C	194			194			

#### 16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	21	483	0.043	21	0.0	7.796	A
C-AB	3	710	0.004	3	0.0	5.262	A
C-A	217			217			
A-B	0			0			
A-C	238			238			

#### 17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	21	483	0.043	21	0.0	7.796	A
C-AB	3	710	0.004	3	0.0	5.278	A
C-A	217			217			
A-B	0			0			
A-C	238			238			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	17	497	0.034	17	0.0	7.509	A
C-AB	2	692	0.004	2	0.0	5.401	A
C-A	177			177			
A-B	0			0			
A-C	194			194			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	14	507	0.028	14	0.0	7.312	A
C-AB	2	679	0.003	2	0.0	5.471	A
C-A	149			149			
A-B	0			0			
A-C	163			163			

# with Development - 2021, AM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	P&R Access / Fordd Bleddyn / Depot Access	T-Junction	Two-way	0.13	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	2021	AM	ONE HOUR	07:15	08:45	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 (PCU/hr)	Scaling Factor (%)
A		✓	375	100.000
B		✓	2	100.000
C		✓	168	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To		
		A	B	C
From	A	0	28	347
	B	1	0	1
	C	159	9	0

## Vehicle Mix

### Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	11
	B	0	0	0
	C	4	0	0



## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.00	0.00	0.0	A
C-AB	0.02	5.81	0.0	A
C-A				
A-B				
A-C				

### Main Results for each time segment

#### 07:15 - 07:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0	488	0.000	0	0.0	0.000	A
C-AB	8	633	0.013	8	0.0	5.801	A
C-A	118			118			
A-B	21			21			
A-C	261			261			

#### 07:30 - 07:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0	473	0.000	0	0.0	0.000	A
C-AB	10	638	0.016	10	0.0	5.782	A
C-A	141			141			
A-B	25			25			
A-C	312			312			

#### 07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0	453	0.000	0	0.0	0.000	A
C-AB	14	645	0.021	14	0.0	5.757	A
C-A	171			171			
A-B	31			31			
A-C	382			382			

#### 08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0	453	0.000	0	0.0	0.000	A
C-AB	14	645	0.021	14	0.0	5.762	A
C-A	171			171			
A-B	31			31			
A-C	382			382			

**08:15 - 08:30**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0	473	0.000	0	0.0	0.000	A
C-AB	10	638	0.016	10	0.0	5.795	A
C-A	141			141			
A-B	25			25			
A-C	312			312			

**08:30 - 08:45**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0	488	0.000	0	0.0	0.000	A
C-AB	8	633	0.013	8	0.0	5.809	A
C-A	118			118			
A-B	21			21			
A-C	261			261			

# with Development - 2021, PM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	P&R Access / Fordd Bleddyn / Depot Access	T-Junction	Two-way	0.38	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	2021	PM	ONE HOUR	16:15	17:45	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 (PCU/hr)	Scaling Factor (%)
A		✓	227	100.000
B		✓	20	100.000
C		✓	211	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To		
		A	B	C
From	A	0	0	227
	B	11	0	9
	C	209	2	0

## Vehicle Mix

### Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	3
	B	0	0	0
	C	13	0	0

## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.05	7.95	0.0	A
C-AB	0.00	5.45	0.0	A
C-A				
A-B				
A-C				

### Main Results for each time segment

#### 16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	15	501	0.030	15	0.0	7.409	A
C-AB	2	683	0.003	2	0.0	5.432	A
C-A	157			157			
A-B	0			0			
A-C	171			171			

#### 16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	18	490	0.037	18	0.0	7.627	A
C-AB	2	697	0.004	2	0.0	5.340	A
C-A	187			187			
A-B	0			0			
A-C	204			204			

#### 16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	22	475	0.046	22	0.0	7.947	A
C-AB	3	716	0.005	3	0.0	5.227	A
C-A	229			229			
A-B	0			0			
A-C	250			250			

#### 17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	22	475	0.046	22	0.0	7.947	A
C-AB	3	716	0.005	3	0.0	5.241	A
C-A	229			229			
A-B	0			0			
A-C	250			250			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	18	490	0.037	18	0.0	7.628	A
C-AB	2	697	0.004	2	0.0	5.371	A
C-A	187			187			
A-B	0			0			
A-C	204			204			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	15	501	0.030	15	0.0	7.416	A
C-AB	2	683	0.003	2	0.0	5.447	A
C-A	157			157			
A-B	0			0			
A-C	171			171			

# with Development - 2031, AM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	P&R Access / Fordd Bleddyn / Depot Access	T-Junction	Two-way	0.13	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)
D5	2031	AM	ONE HOUR	07:15	08:45	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 (PCU/hr)	Scaling Factor (%)
A		✓	403	100.000
B		✓	2	100.000
C		✓	181	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To		
		A	B	C
From	A	0	31	372
	B	1	0	1
	C	171	10	0

## Vehicle Mix

### Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	11
	B	0	0	0
	C	4	0	0

## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.00	0.00	0.0	A
C-AB	0.02	5.80	0.0	A
C-A				
A-B				
A-C				

### Main Results for each time segment

#### 07:15 - 07:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0	482	0.000	0	0.0	0.000	A
C-AB	9	635	0.015	9	0.0	5.798	A
C-A	127			127			
A-B	23			23			
A-C	280			280			

#### 07:30 - 07:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0	466	0.000	0	0.0	0.000	A
C-AB	12	640	0.019	12	0.0	5.777	A
C-A	151			151			
A-B	28			28			
A-C	334			334			

#### 07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0	445	0.000	0	0.0	0.000	A
C-AB	16	648	0.024	16	0.0	5.750	A
C-A	184			184			
A-B	34			34			
A-C	410			410			

#### 08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0	445	0.000	0	0.0	0.000	A
C-AB	16	648	0.024	16	0.0	5.756	A
C-A	184			184			
A-B	34			34			
A-C	410			410			

**08:15 - 08:30**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0	466	0.000	0	0.0	0.000	A
C-AB	12	640	0.019	12	0.0	5.791	A
C-A	151			151			
A-B	28			28			
A-C	334			334			

**08:30 - 08:45**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0	482	0.000	0	0.0	0.000	A
C-AB	9	635	0.015	9	0.0	5.803	A
C-A	127			127			
A-B	23			23			
A-C	280			280			



# with Development - 2031, PM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	P&R Access / Fordd Bleddyn / Depot Access	T-Junction	Two-way	0.37	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)
D6	2031	PM	ONE HOUR	16:15	17:45	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 (PCU/hr)	Scaling Factor (%)
A		✓	244	100.000
B		✓	21	100.000
C		✓	226	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To		
		A	B	C
From	A	0	0	244
	B	11	0	10
	C	224	2	0

## Vehicle Mix

### Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	3
	B	0	0	0
	C	13	0	0

## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.05	8.00	0.1	A
C-AB	0.00	5.42	0.0	A
C-A				
A-B				
A-C				

### Main Results for each time segment

#### 16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	16	500	0.032	16	0.0	7.424	A
C-AB	2	688	0.003	2	0.0	5.402	A
C-A	168			168			
A-B	0			0			
A-C	184			184			

#### 16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	19	489	0.039	19	0.0	7.656	A
C-AB	3	703	0.004	3	0.0	5.304	A
C-A	201			201			
A-B	0			0			
A-C	219			219			

#### 16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	23	473	0.049	23	0.1	7.998	A
C-AB	3	724	0.005	3	0.0	5.183	A
C-A	245			245			
A-B	0			0			
A-C	269			269			

#### 17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	23	473	0.049	23	0.1	8.000	A
C-AB	3	724	0.005	3	0.0	5.200	A
C-A	245			245			
A-B	0			0			
A-C	269			269			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	19	489	0.039	19	0.0	7.661	A
C-AB	3	703	0.004	3	0.0	5.336	A
C-A	201			201			
A-B	0			0			
A-C	219			219			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	16	500	0.032	16	0.0	7.431	A
C-AB	2	688	0.003	2	0.0	5.420	A
C-A	168			168			
A-B	0			0			
A-C	184			184			

Junctions 9
PICADY 9 - Priority Intersection Module
Version: 9.0.1.4646 [] © Copyright TRL Limited, 2017
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**Filename:** Moy Road to Moy Road Link Base Year v4.j9  
**Path:** P:\Cardiff\ERA\ITD\Projects\367590 Cardiff Metro\Task Order 028i Taffs Well Depot\6. Design\Modelling\PICADY  
**Report generation date:** 15/11/2017 14:01:23

- »Base - 2017, AM
- »Base - 2017, PM
- »Base - 2021, AM
- »Base - 2021, PM
- »Base - 2031, AM
- »Base - 2031, PM

**Summary of junction performance**

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
<b>Base - 2017</b>								
Stream B-AC	0.2	7.60	0.18	A	0.8	11.44	0.43	B
Stream C-AB	0.9	11.87	0.47	B	0.3	7.73	0.23	A
<b>Base - 2021</b>								
Stream B-AC	0.3	7.70	0.19	A	0.9	12.01	0.46	B
Stream C-AB	1.0	12.47	0.49	B	0.3	7.86	0.25	A
<b>Base - 2031</b>								
Stream B-AC	0.3	7.90	0.21	A	1.0	12.87	0.49	B
Stream C-AB	1.2	13.53	0.53	B	0.4	8.03	0.26	A

*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

<b>Title</b>	Moy Road to Moy Road Link Base
<b>Location</b>	
<b>Site number</b>	
<b>Date</b>	04/09/2017
<b>Version</b>	
<b>Status</b>	
<b>Identifier</b>	
<b>Client</b>	
<b>Jobnumber</b>	
<b>Enumerator</b>	MOTTMAC\EGG81001
<b>Description</b>	

## 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	PCU	PCU	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	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2017	AM	2017 AM Base	ONE HOUR	07:15	08:45	15
D2	2017	PM	2017 PM Base	ONE HOUR	16:15	17:45	15
D3	2021	AM	2021 AM Base	ONE HOUR	07:15	08:45	15
D4	2021	PM	2021 PM Base	ONE HOUR	16:15	17:45	15
D5	2031	AM	2031 AM Base	ONE HOUR	07:15	08:45	15
D6	2031	PM	2031 PM Base	ONE HOUR	16:15	17:45	15

## Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Base	100.000

# Base - 2017, AM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
TWD	Moy Road Moy Road Link	T-Junction	Two-way	7.52	A

### Junction Network Options

Driving side	Lighting
Left	Normal/unknown

## Arms

### Arms

Arm	Name	Description	Arm type
A	Moy Road East		Major
B	Ffordd Bleddyn	Minor Arm	Minor
C	Moy Road West		Major

### Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	7.46			89.6	✓	1.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

### Minor Arm Geometry

Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
B	One lane	3.42	30	32

## Slope / Intercept / Capacity

### Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
TWD	B-A	524	0.089	0.226	0.142	0.323
TWD	B-C	671	0.096	0.243	-	-
TWD	C-B	626	0.227	0.227	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

## Traffic Demand

### Demand Set Details

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2017	AM	2017 AM Base	ONE HOUR	07:15	08:45	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 (PCU/hr)	Scaling Factor (%)
A		✓	127	100.000
B		✓	102	100.000
C		✓	277	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To		
		A	B	C
From	A	0	76	51
	B	8	0	94
	C	26	251	0

## Vehicle Mix

### Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	1	4
	B	0	0	8
	C	18	7	0

## Detailed Demand Data

### Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
07:15-07:30	A	96	96
	B	77	77
	C	209	209
07:30-07:45	A	114	114
	B	92	92
	C	249	249
07:45-08:00	A	140	140
	B	112	112
	C	305	305
08:00-08:15	A	140	140
	B	112	112
	C	305	305
08:15-08:30	A	114	114
	B	92	92
	C	249	249
08:30-08:45	A	96	96
	B	77	77
	C	209	209

## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.18	7.60	0.2	A
C-AB	0.47	11.87	0.9	B
C-A				
A-B				
A-C				

### Main Results for each time segment

#### 07:15 - 07:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	77	633	0.121	76	0.1	6.935	A
C-AB	191	611	0.313	189	0.5	9.105	A
C-A	18			18			
A-B	57			57			
A-C	38			38			



**07:30 - 07:45**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	92	628	0.146	92	0.2	7.204	A
C-AB	229	609	0.376	229	0.6	10.115	B
C-A	20			20			
A-B	68			68			
A-C	46			46			

**07:45 - 08:00**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	112	621	0.181	112	0.2	7.592	A
C-AB	283	608	0.465	282	0.9	11.789	B
C-A	22			22			
A-B	84			84			
A-C	56			56			

**08:00 - 08:15**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	112	621	0.181	112	0.2	7.599	A
C-AB	283	608	0.465	283	0.9	11.868	B
C-A	22			22			
A-B	84			84			
A-C	56			56			

**08:15 - 08:30**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	92	628	0.146	92	0.2	7.213	A
C-AB	229	610	0.376	230	0.7	10.207	B
C-A	20			20			
A-B	68			68			
A-C	46			46			

**08:30 - 08:45**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	77	633	0.121	77	0.1	6.954	A
C-AB	191	611	0.313	192	0.5	9.218	A
C-A	18			18			
A-B	57			57			
A-C	38			38			

# Base - 2017, PM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
TWD	Moy Road Moy Road Link	T-Junction	Two-way	7.26	A

### Junction Network Options

Driving side	Lighting
Left	Normal/unknown

## Traffic Demand

### Demand Set Details

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2017	PM	2017 PM Base	ONE HOUR	16:15	17:45	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 (PCU/hr)	Scaling Factor (%)
A		✓	83	100.000
B		✓	224	100.000
C		✓	186	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To		
		A	B	C
From	A	0	36	47
	B	72	0	152
	C	57	129	0

## Vehicle Mix

### Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	1	0	5
	C	0	2	0

## Detailed Demand Data

### Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
16:15-16:30	A	62	62
	B	169	169
	C	140	140
16:30-16:45	A	75	75
	B	201	201
	C	167	167
16:45-17:00	A	91	91
	B	247	247
	C	205	205
17:00-17:15	A	91	91
	B	247	247
	C	205	205
17:15-17:30	A	75	75
	B	201	201
	C	167	167
17:30-17:45	A	62	62
	B	169	169
	C	140	140

## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.43	11.44	0.8	B
C-AB	0.23	7.73	0.3	A
C-A				
A-B				
A-C				

### Main Results for each time segment

#### 16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	169	587	0.287	167	0.4	8.854	A
C-AB	98	619	0.159	97	0.2	7.032	A
C-A	42			42			
A-B	27			27			
A-C	35			35			

**16:30 - 16:45**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	201	581	0.347	201	0.5	9.802	A
C-AB	118	619	0.190	118	0.2	7.321	A
C-A	49			49			
A-B	32			32			
A-C	42			42			

**16:45 - 17:00**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	247	573	0.430	246	0.8	11.374	B
C-AB	146	620	0.235	145	0.3	7.721	A
C-A	59			59			
A-B	40			40			
A-C	52			52			

**17:00 - 17:15**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	247	573	0.430	247	0.8	11.437	B
C-AB	146	620	0.235	146	0.3	7.733	A
C-A	59			59			
A-B	40			40			
A-C	52			52			

**17:15 - 17:30**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	201	581	0.347	202	0.6	9.876	A
C-AB	118	619	0.190	118	0.2	7.333	A
C-A	49			49			
A-B	32			32			
A-C	42			42			

**17:30 - 17:45**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	169	587	0.287	169	0.4	8.950	A
C-AB	98	619	0.159	98	0.2	7.060	A
C-A	42			42			
A-B	27			27			
A-C	35			35			

# Base - 2021, AM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
TWD	Moy Road Moy Road Link	T-Junction	Two-way	7.86	A

### Junction Network Options

Driving side	Lighting
Left	Normal/unknown

## Traffic Demand

### Demand Set Details

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D3	2021	AM	2021 AM Base	ONE HOUR	07:15	08:45	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 (PCU/hr)	Scaling Factor (%)
A		✓	134	100.000
B		✓	107	100.000
C		✓	291	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To		
		A	B	C
From	A	0	80	54
	B	8	0	99
	C	27	264	0

## Vehicle Mix

### Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	1	4
	B	0	0	8
	C	18	7	0

## Detailed Demand Data

### Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
07:15-07:30	A	101	101
	B	81	81
	C	219	219
07:30-07:45	A	120	120
	B	96	96
	C	262	262
07:45-08:00	A	148	148
	B	118	118
	C	320	320
08:00-08:15	A	148	148
	B	118	118
	C	320	320
08:15-08:30	A	120	120
	B	96	96
	C	262	262
08:30-08:45	A	101	101
	B	81	81
	C	219	219

## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.19	7.70	0.3	A
C-AB	0.49	12.47	1.0	B
C-A				
A-B				
A-C				

### Main Results for each time segment

#### 07:15 - 07:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	81	632	0.127	80	0.2	6.988	A
C-AB	201	610	0.330	199	0.5	9.335	A
C-A	18			18			
A-B	60			60			
A-C	41			41			

**07:30 - 07:45**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	96	627	0.153	96	0.2	7.274	A
C-AB	241	609	0.397	241	0.7	10.462	B
C-A	20			20			
A-B	72			72			
A-C	49			49			

**07:45 - 08:00**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	118	620	0.190	118	0.2	7.691	A
C-AB	298	607	0.491	297	1.0	12.375	B
C-A	22			22			
A-B	88			88			
A-C	59			59			

**08:00 - 08:15**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	118	620	0.190	118	0.3	7.698	A
C-AB	298	608	0.491	298	1.0	12.475	B
C-A	22			22			
A-B	88			88			
A-C	59			59			

**08:15 - 08:30**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	96	627	0.153	96	0.2	7.284	A
C-AB	241	609	0.396	243	0.7	10.578	B
C-A	20			20			
A-B	72			72			
A-C	49			49			

**08:30 - 08:45**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	81	632	0.127	81	0.2	7.007	A
C-AB	201	610	0.330	202	0.5	9.465	A
C-A	18			18			
A-B	60			60			
A-C	41			41			

# Base - 2021, PM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
TWD	Moy Road Moy Road Link	T-Junction	Two-way	7.57	A

### Junction Network Options

Driving side	Lighting
Left	Normal/unknown

## Traffic Demand

### Demand Set Details

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D4	2021	PM	2021 PM Base	ONE HOUR	16:15	17:45	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 (PCU/hr)	Scaling Factor (%)
A		✓	86	100.000
B		✓	236	100.000
C		✓	196	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To		
		A	B	C
From	A	0	37	49
	B	76	0	160
	C	60	136	0

## Vehicle Mix

### Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	1	0	5
	C	0	2	0



## Detailed Demand Data

### Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
16:15-16:30	A	65	65
	B	178	178
	C	148	148
16:30-16:45	A	78	78
	B	212	212
	C	176	176
16:45-17:00	A	95	95
	B	260	260
	C	216	216
17:00-17:15	A	95	95
	B	260	260
	C	216	216
17:15-17:30	A	78	78
	B	212	212
	C	176	176
17:30-17:45	A	65	65
	B	178	178
	C	148	148

## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.46	12.01	0.9	B
C-AB	0.25	7.86	0.3	A
C-A				
A-B				
A-C				

### Main Results for each time segment

#### 16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	178	585	0.304	176	0.4	9.078	A
C-AB	104	619	0.168	103	0.2	7.114	A
C-A	44			44			
A-B	28			28			
A-C	37			37			

**16:30 - 16:45**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	212	579	0.366	212	0.6	10.138	B
C-AB	125	619	0.201	124	0.3	7.410	A
C-A	52			52			
A-B	33			33			
A-C	44			44			

**16:45 - 17:00**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	260	571	0.455	259	0.8	11.932	B
C-AB	154	621	0.248	154	0.3	7.846	A
C-A	62			62			
A-B	41			41			
A-C	54			54			

**17:00 - 17:15**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	260	570	0.455	260	0.9	12.009	B
C-AB	154	621	0.248	154	0.3	7.856	A
C-A	62			62			
A-B	41			41			
A-C	54			54			

**17:15 - 17:30**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	212	579	0.366	213	0.6	10.228	B
C-AB	125	619	0.201	125	0.3	7.429	A
C-A	52			52			
A-B	33			33			
A-C	44			44			

**17:30 - 17:45**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	178	585	0.304	178	0.5	9.186	A
C-AB	104	619	0.168	104	0.2	7.133	A
C-A	44			44			
A-B	28			28			
A-C	37			37			

# Base - 2031, AM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
TWD	Moy Road Moy Road Link	T-Junction	Two-way	8.46	A

### Junction Network Options

Driving side	Lighting
Left	Normal/unknown

## Traffic Demand

### Demand Set Details

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D5	2031	AM	2031 AM Base	ONE HOUR	07:15	08:45	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 (PCU/hr)	Scaling Factor (%)
A		✓	144	100.000
B		✓	115	100.000
C		✓	313	100.000

## Origin-Destination Data

### Demand (PCU/hr)

	To			
	A	B	C	
From	A	0	86	58
	B	9	0	106
	C	29	284	0

## Vehicle Mix

### Heavy Vehicle Percentages

	To			
	A	B	C	
From	A	0	1	4
	B	0	0	8
	C	18	7	0

## Detailed Demand Data

### Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
07:15-07:30	A	108	108
	B	87	87
	C	236	236
07:30-07:45	A	129	129
	B	103	103
	C	281	281
07:45-08:00	A	159	159
	B	127	127
	C	345	345
08:00-08:15	A	159	159
	B	127	127
	C	345	345
08:15-08:30	A	129	129
	B	103	103
	C	281	281
08:30-08:45	A	108	108
	B	87	87
	C	236	236

## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.21	7.90	0.3	A
C-AB	0.53	13.53	1.2	B
C-A				
A-B				
A-C				

### Main Results for each time segment

#### 07:15 - 07:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	87	629	0.138	86	0.2	7.099	A
C-AB	217	610	0.356	214	0.6	9.707	A
C-A	19			19			
A-B	65			65			
A-C	44			44			

**07:30 - 07:45**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	103	624	0.166	103	0.2	7.422	A
C-AB	260	608	0.428	260	0.8	11.031	B
C-A	21			21			
A-B	77			77			
A-C	52			52			

**07:45 - 08:00**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	127	616	0.206	126	0.3	7.894	A
C-AB	322	607	0.530	320	1.2	13.386	B
C-A	23			23			
A-B	95			95			
A-C	64			64			

**08:00 - 08:15**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	127	615	0.206	127	0.3	7.904	A
C-AB	322	608	0.530	322	1.2	13.529	B
C-A	23			23			
A-B	95			95			
A-C	64			64			

**08:15 - 08:30**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	103	624	0.166	104	0.2	7.437	A
C-AB	260	609	0.428	262	0.8	11.197	B
C-A	21			21			
A-B	77			77			
A-C	52			52			

**08:30 - 08:45**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	87	629	0.138	87	0.2	7.126	A
C-AB	217	610	0.356	218	0.6	9.867	A
C-A	19			19			
A-B	65			65			
A-C	44			44			

# Base - 2031, PM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
TWD	Moy Road Moy Road Link	T-Junction	Two-way	8.00	A

### Junction Network Options

Driving side	Lighting
Left	Normal/unknown

## Traffic Demand

### Demand Set Details

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D6	2031	PM	2031 PM Base	ONE HOUR	16:15	17:45	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 (PCU/hr)	Scaling Factor (%)
A		✓	93	100.000
B		✓	252	100.000
C		✓	209	100.000

## Origin-Destination Data

### Demand (PCU/hr)

	To			
	A	B	C	
From	A	0	40	53
	B	81	0	171
	C	64	145	0

## Vehicle Mix

### Heavy Vehicle Percentages

	To			
	A	B	C	
From	A	0	0	0
	B	1	0	5
	C	0	2	0

## Detailed Demand Data

### Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
16:15-16:30	A	70	70
	B	190	190
	C	157	157
16:30-16:45	A	84	84
	B	227	227
	C	188	188
16:45-17:00	A	102	102
	B	277	277
	C	230	230
17:00-17:15	A	102	102
	B	277	277
	C	230	230
17:15-17:30	A	84	84
	B	227	227
	C	188	188
17:30-17:45	A	70	70
	B	190	190
	C	157	157

## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.49	12.87	1.0	B
C-AB	0.26	8.03	0.4	A
C-A				
A-B				
A-C				

### Main Results for each time segment

#### 16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	190	583	0.325	188	0.5	9.393	A
C-AB	111	619	0.179	110	0.2	7.200	A
C-A	47			47			
A-B	30			30			
A-C	40			40			

**16:30 - 16:45**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	227	577	0.393	226	0.7	10.619	B
C-AB	133	620	0.215	133	0.3	7.537	A
C-A	55			55			
A-B	36			36			
A-C	48			48			

**16:45 - 17:00**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	277	567	0.489	276	1.0	12.761	B
C-AB	165	622	0.265	164	0.4	8.017	A
C-A	65			65			
A-B	44			44			
A-C	58			58			

**17:00 - 17:15**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	277	567	0.489	277	1.0	12.867	B
C-AB	165	622	0.265	165	0.4	8.029	A
C-A	65			65			
A-B	44			44			
A-C	58			58			

**17:15 - 17:30**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	227	577	0.393	228	0.7	10.736	B
C-AB	133	620	0.215	133	0.3	7.558	A
C-A	55			55			
A-B	36			36			
A-C	48			48			

**17:30 - 17:45**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	190	583	0.325	190	0.5	9.522	A
C-AB	111	619	0.179	111	0.2	7.230	A
C-A	47			47			
A-B	30			30			
A-C	40			40			



Junctions 9
PICADY 9 - Priority Intersection Module
Version: 9.0.1.4646 [] © Copyright TRL Limited, 2017
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**Filename:** Moy Road to Moy Road Link Future YearV4.j9  
**Path:** P:\Cardiff\ERA\ITD\Projects\367590 Cardiff Metro\Task Order 028i Taffs Well Depot\6. Design\Modelling\PICADY  
**Report generation date:** 08/11/2017 14:30:02

- »with Development - 2021, AM
- »with Development - 2021, PM
- »with Development - 2031, AM
- »with Development - 2031, PM

### Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
<b>with Development - 2021</b>								
Stream B-AC	0.3	9.41	0.22	A	1.2	16.87	0.54	C
Stream C-AB	1.1	12.80	0.50	B	0.3	7.87	0.25	A
<b>with Development - 2031</b>								
Stream B-AC	0.3	9.70	0.24	A	1.4	18.58	0.58	C
Stream C-AB	1.3	13.85	0.54	B	0.4	8.05	0.27	A

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

<b>Title</b>	(untitled)
<b>Location</b>	
<b>Site number</b>	
<b>Date</b>	07/09/2017
<b>Version</b>	
<b>Status</b>	(new file)
<b>Identifier</b>	
<b>Client</b>	
<b>Jobnumber</b>	
<b>Enumerator</b>	MOTTMAC\EGG81001
<b>Description</b>	

## 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	PCU	PCU	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	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2021	AM	2021 AM Future Year	ONE HOUR	07:15	08:45	15
D2	2021	PM	2021 PM Future Year	ONE HOUR	16:15	17:45	15
D3	2031	AM	2031 AM Future Year	ONE HOUR	07:15	08:45	15
D4	2031	PM	2031 PM Future Year	ONE HOUR	16:15	17:45	15

## Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	with Development	100.000

# with Development - 2021, AM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	8.43	A

### Junction Network Options

Driving side	Lighting
Left	Normal/unknown

## Arms

### Arms

Arm	Name	Description	Arm type
A	Moy Road East		Major
B	Moy Road Link		Minor
C	Moy Road West		Major

### Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	7.46			89.6	✓	1.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

### Minor Arm Geometry

Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
B	One lane	2.20	0	0

## Slope / Intercept / Capacity

### Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	440	0.075	0.190	0.119	0.271
1	B-C	574	0.082	0.208	-	-
1	C-B	626	0.227	0.227	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

## Traffic Demand

### Demand Set Details

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2021	AM	2021 AM Future Year	ONE HOUR	07:15	08:45	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 (PCU/hr)	Scaling Factor (%)
A		✓	134	100.000
B		✓	107	100.000
C		✓	298	100.000

## Origin-Destination Data

### Demand (PCU/hr)

	To			
	A	B	C	
From	A	0	80	54
	B	8	0	99
	C	27	271	0

## Vehicle Mix

### Heavy Vehicle Percentages

	To			
	A	B	C	
From	A	0	1	4
	B	0	0	8
	C	18	7	0

## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.22	9.41	0.3	A
C-AB	0.50	12.80	1.1	B
C-A				
A-B				
A-C				

## Main Results for each time segment

### 07:15 - 07:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	81	540	0.149	80	0.2	8.390	A
C-AB	207	610	0.338	204	0.5	9.450	A
C-A	18			18			
A-B	60			60			
A-C	41			41			

### 07:30 - 07:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	96	535	0.180	96	0.2	8.797	A
C-AB	248	609	0.407	247	0.7	10.642	B
C-A	20			20			
A-B	72			72			
A-C	49			49			

### 07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	118	529	0.223	118	0.3	9.391	A
C-AB	306	608	0.504	305	1.1	12.683	B
C-A	22			22			
A-B	88			88			
A-C	59			59			

### 08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	118	529	0.223	118	0.3	9.406	A
C-AB	306	608	0.504	306	1.1	12.795	B
C-A	22			22			
A-B	88			88			
A-C	59			59			

### 08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	96	535	0.180	96	0.2	8.819	A
C-AB	248	609	0.407	249	0.8	10.769	B
C-A	20			20			
A-B	72			72			
A-C	49			49			

### 08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	81	540	0.149	81	0.2	8.428	A
C-AB	207	610	0.338	207	0.6	9.589	A
C-A	18			18			
A-B	60			60			
A-C	41			41			

# with Development - 2021, PM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	9.85	A

### Junction Network Options

Driving side	Lighting
Left	Normal/unknown

## Traffic Demand

### Demand Set Details

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2021	PM	2021 PM Future Year	ONE HOUR	16:15	17:45	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 (PCU/hr)	Scaling Factor (%)
A		✓	86	100.000
B		✓	240	100.000
C		✓	197	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To		
		A	B	C
From	A	0	37	49
	B	76	0	164
	C	60	137	0

## Vehicle Mix

### Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	1	0	5
	C	0	2	0

## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.54	16.87	1.2	C
C-AB	0.25	7.87	0.3	A
C-A				
A-B				
A-C				

### Main Results for each time segment

#### 16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	181	498	0.363	178	0.6	11.606	B
C-AB	104	619	0.169	104	0.2	7.111	A
C-A	44			44			
A-B	28			28			
A-C	37			37			

#### 16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	216	493	0.438	215	0.8	13.362	B
C-AB	125	620	0.202	125	0.3	7.421	A
C-A	52			52			
A-B	33			33			
A-C	44			44			

#### 16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	264	485	0.545	263	1.2	16.642	C
C-AB	155	621	0.250	155	0.3	7.862	A
C-A	62			62			
A-B	41			41			
A-C	54			54			

#### 17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	264	485	0.545	264	1.2	16.872	C
C-AB	155	621	0.250	155	0.3	7.873	A
C-A	62			62			
A-B	41			41			
A-C	54			54			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	216	492	0.438	217	0.8	13.646	B
C-AB	125	620	0.202	126	0.3	7.440	A
C-A	52			52			
A-B	33			33			
A-C	44			44			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	181	498	0.363	182	0.6	11.845	B
C-AB	104	619	0.169	105	0.2	7.142	A
C-A	44			44			
A-B	28			28			
A-C	37			37			



# with Development - 2031, AM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	9.04	A

### Junction Network Options

Driving side	Lighting
Left	Normal/unknown

## Traffic Demand

### Demand Set Details

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D3	2031	AM	2031 AM Future Year	ONE HOUR	07:15	08:45	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 (PCU/hr)	Scaling Factor (%)
A		✓	144	100.000
B		✓	115	100.000
C		✓	319	100.000

## Origin-Destination Data

### Demand (PCU/hr)

	To			
	A	B	C	
From	A	0	86	58
	B	9	0	106
	C	29	290	0

## Vehicle Mix

### Heavy Vehicle Percentages

	To			
	A	B	C	
From	A	0	1	4
	B	0	0	8
	C	18	7	0

## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.24	9.70	0.3	A
C-AB	0.54	13.85	1.3	B
C-A				
A-B				
A-C				

### Main Results for each time segment

#### 07:15 - 07:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	87	537	0.161	86	0.2	8.546	A
C-AB	221	610	0.363	219	0.6	9.814	A
C-A	19			19			
A-B	65			65			
A-C	44			44			

#### 07:30 - 07:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	103	532	0.194	103	0.3	9.004	A
C-AB	266	608	0.437	265	0.8	11.211	B
C-A	21			21			
A-B	77			77			
A-C	52			52			

#### 07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	127	525	0.241	126	0.3	9.684	A
C-AB	329	608	0.542	327	1.3	13.693	B
C-A	22			22			
A-B	95			95			
A-C	64			64			

#### 08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	127	525	0.241	127	0.3	9.701	A
C-AB	329	608	0.541	329	1.3	13.853	B
C-A	22			22			
A-B	95			95			
A-C	64			64			

**08:15 - 08:30**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	103	532	0.194	104	0.3	9.028	A
C-AB	266	609	0.437	268	0.9	11.379	B
C-A	21			21			
A-B	77			77			
A-C	52			52			

**08:30 - 08:45**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	87	537	0.161	87	0.2	8.587	A
C-AB	221	610	0.363	222	0.6	9.985	A
C-A	19			19			
A-B	65			65			
A-C	44			44			

# with Development - 2031, PM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	10.66	B

### Junction Network Options

Driving side	Lighting
Left	Normal/unknown

## Traffic Demand

### Demand Set Details

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D4	2031	PM	2031 PM Future Year	ONE HOUR	16:15	17:45	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 (PCU/hr)	Scaling Factor (%)
A		✓	93	100.000
B		✓	256	100.000
C		✓	210	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To		
		A	B	C
From	A	0	40	53
	B	81	0	175
	C	64	146	0

## Vehicle Mix

### Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	1	0	5
	C	0	2	0

## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.58	18.58	1.4	C
C-AB	0.27	8.05	0.4	A
C-A				
A-B				
A-C				

### Main Results for each time segment

#### 16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	193	496	0.389	190	0.6	12.111	B
C-AB	112	619	0.180	111	0.2	7.211	A
C-A	47			47			
A-B	30			30			
A-C	40			40			

#### 16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	230	490	0.469	229	0.9	14.238	B
C-AB	134	620	0.216	134	0.3	7.550	A
C-A	55			55			
A-B	36			36			
A-C	48			48			

#### 16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	282	482	0.584	280	1.4	18.241	C
C-AB	166	622	0.267	166	0.4	8.036	A
C-A	65			65			
A-B	44			44			
A-C	58			58			

#### 17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	282	482	0.584	282	1.4	18.578	C
C-AB	166	622	0.267	166	0.4	8.048	A
C-A	65			65			
A-B	44			44			
A-C	58			58			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	230	490	0.470	232	0.9	14.572	B
C-AB	134	620	0.216	134	0.3	7.568	A
C-A	55			55			
A-B	36			36			
A-C	48			48			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	193	496	0.389	194	0.7	12.406	B
C-AB	112	619	0.180	112	0.2	7.244	A
C-A	47			47			
A-B	30			30			
A-C	40			40			

