ROCKFIELD FARM STRATEGIC DEVELOPMENT SITES

Transport Assessment

July 2016

WSP | PARSONS BRINCKERHOFF

ROCKFIELD FARM STRATEGIC DEVELOPMENT SITES

TRANSPORT ASSESSMENT

Monmouthshire County Council

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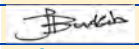
Signature				
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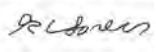
Signature				
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1 INTRODUCTION

1.1 BACKGROUND

1.1.1 WSP | Parsons Brinckerhoff (WSP | PB) has been commissioned by Monmouthshire County Council (MCC) to develop a Transport Assessment (TA) in support of a Planning Application for the development of the Rockfield Farm site, Magor/Undy. This provides an update to the TA produced by Capita, formerly Capita Symonds, in 2010 for part of the proposed Local Development Plan (LDP) candidate site located at Rockfield Farm. The scope of this updated Transport Assessment has been agreed with MCC.

1.1.2 The Rockfield Farm proposed development is located on site SAH5 within the Adopted Monmouthshire Local Development Plan (LDP) 2011 - 2021. Rockfield Farm (SAH5) comprises a Strategic Mixed Use Site of predominantly housing development with part employment use (Class B1 of TACP (Use Classes) Order).

1.1.3 The content of the TA is in accordance with the Planning Policy Wales and informed by guidance provided by the DfT and IHT. The guidance acknowledges that Transport Assessments are an important mechanism for setting out the scale of anticipated impacts a proposed development is likely to have. Furthermore, outlines that new developments must include appropriate provision for pedestrians (including those with special access and mobility requirements), cyclists, public transport, traffic management, and parking provision.

1.2 DEVELOPMENT PROPOSALS

1.2.1 The development proposals are understood to comprise of the following;

- → 266 new dwellings
- → 5,575m^2 employment (B1) land-use
- → A new access from the B4245 near Rockfield Grove

1.2.2 The proposals for the site have been revised following allocation in the LDP. The allocation in site SAH5 is for 270 houses together with approximately 5 acres of employment land, plus amenity open space and enhanced financial contribution for community facilities in the area. The LDP also acknowledges that there is a need to safeguard a route for a potential Magor/Undy by-pass and will also not prejudice a potential M4 Relief Road.

1.2.3 The assessment undertaken in this report considers the implication of 345 housing units and 5,575 employment (B1) land use, and is therefore considered robust.

1.3 STRUCTURE OF THIS REPORT

1.3.1 The remainder of this report is set out as follows:

- Section 2 – summarises relevant National, Regional and Local policies and objectives.
- Section 3 – details existing conditions of the development site and local transport conditions in the base year.
- Section 4 – presents an overview of the development proposals.
- Section 5 – outlines the predicted travel demand of the proposed development.
- Section 6 – outlines the vehicular traffic impact of the proposed development upon the local highway network.
- Section 7 – outlines the Transport Implementation Strategy for the development.
- Section 8 – provides a summary and conclusion.

2 POLICY REVIEW

2.1 INTRODUCTION

2.1.1 A review has been undertaken of the relevant national, regional, and local transport policy documents in order to inform the development proposals.

2.2 NATIONAL POLICY

PLANNING POLICY WALES (2016)

2.2.1 Planning Policy Wales (PPW) Edition 8 (January 2016) sets out the land use planning policies of the Welsh Government (WG), with supporting technical guidance provided within Technical Advice Note 18: Transport (TAN 18).

2.2.2 Chapter 8 of PPW sets out the WG's Transport policy. A brief overview of the objectives is set out below:

- Locating development where there is good access by public transport, walking and cycling
- Locate development so that it can be well serviced by existing infrastructure
- Supporting the provision of high quality public transport, walking, and cycling
- Ensuring that transport is accessible to all, taking into account the needs of disabled and other less mobile people
- Supporting necessary infrastructure improvements and traffic management measures

2.2.3 The WG aims to extend choices in transport and secure accessibility in a way that supports sustainable development. This will be achieved through integration:

- Within and between different types of transport
- Between transport measures and land use planning
- Between transport measures and policies for education, health, social inclusion, and wealth creation

2.2.4 PPW summarises the Active Travel (Wales) Act 2013, which aims to make walking and cycling the most attractive option for shorter journeys, as well as identifying that local authorities should promote public transport.

2.2.5 PPW acknowledges that Transport Assessments are an important mechanism for setting out the scale of anticipated impacts a proposed development is likely to have. They assist in helping to anticipate the impacts so that they can be understood and catered for. The Welsh Government expects that all applications for developments over specific thresholds will be accompanied by a TA, which includes developments of more than 100 dwellings and 5,000m^2.

TECHNICAL ADVICE NOTE 18 (TRANSPORT) (2007)

2.2.6 TAN 18 was published by the WG in March 2007 and is a supplementary document to Planning Policy Wales (PPW). It provides guidance on issues relating to sustainable development through transport.

2.2.7 By integrating land use planning and transport, TAN 18 can help the WG achieve its wider sustainable goals, such as:

- Promoting resource and travel efficient settlement patterns
- Support the provision of high quality public transport
- Demand management through road user charging and workplace parking levy
- Road traffic reduction
- Ensure that major travel generating developments are easily accessible by a range of transport modes from nearby residential areas
- Inclusive mobility and access for disabled people
- Public transport integration across a wider area

2.2.8 TAN 18 states that new developments or major alterations to existing developments must include appropriate provision for pedestrians (including those with special access and mobility requirements), cyclists, public transport, and traffic managements, and parking provision.

2.2.9 In addition, developments that may incur an increase in travel demand should consider the potential for changing existing unsustainable travel through a co-ordinated approach to the development plan application and transport improvement.

NATIONAL TRANSPORT PLAN (2015)

2.2.10 The Wales Transport Strategy was published in 2010 and is a statutory strategy required by the Transport (Wales) Act 2006. This set out the policy framework for transport in Wales and the outcomes that transport interventions should contribute to. The National Transport Plan sits within the framework provided by the Strategy and sets out in more details how the policies and objectives in the Strategy will delivered.

2.2.11 Within the framework of the Wales Transport Strategy, the National Transport Plan focuses on delivering five key priorities:

- Economic growth
- Access to employment
- Tackling poverty
- Sustainable travel and safety
- Access to services

2.2.12 The National Transport Plan 2015 sets out in more detail how the Welsh Government proposes to deliver in those areas of transport for which it is responsible, to achieve the outcomes as set out in the Wales Transport Strategy from 2015 and beyond.

NATIONAL TRANSPORT FINANCE PLAN (2015)

2.2.13 The National Transport Finance Plan sets out in more detail how the Welsh Government propose to deliver the outcomes set out in the Wales Transport Strategy from 2015 and beyond. It is not a policy document; it brings together projects already being delivered.

2.2.14 The purpose of the plan is to:

- Provide the timescale for financing the schemes undertaken by the Welsh Government
- Provide the timescale for delivering these schemes
- Detail the estimated expenditure required to deliver the schemes
- Identify the likely source of financing to allow delivery to take place

2.2.15 The delivery schedule included as an Annex to the Finance Plan identifies that the improvements to the M4 Corridor around Newport are to be delivered beyond the plan period 2015 to 2020. This scheme incorporates a new section of motorway south of Newport and complementary measures including the reclassification of the existing M4 between Magor and Castleton, an M48- B4245 link, and cycling and walking friendly infrastructure.

ACTIVE TRAVEL ACT (2013)

2.2.16 A priority for WG has been to enable more people to walk and cycle as a mode of travel for part or all of a journey. These changes aim to improve health in communities, reduce greenhouse gas emissions, help address poverty and disadvantage, and help the economy grow by unlocking sustainable economic growth.

2.2.17 The Active Travel Act was introduced in November 2013 and applies to all new development within Wales. For the purposes of definition, ‘active’ refers to walking and cycling routes. The Active Travel Act requires the Welsh Ministers and local authorities to take reasonable steps to enhance the provision made for, and to have regard to the needs of, walkers, and cyclists.

2.2.18 The Act makes provisions for:

- Approved integrated network maps of new and existing active travel routes and related facilities in a local authority’s area
- Requiring local authorities to have regard to integrated network maps in preparing transport policies and to make continuous improvement in the range and quality of active travel routes and related facilities
- Requiring the Welsh Ministers and local authorities, in constructing and improving highways, to have regard to the desirability of enhancing the provision made for walking and cycling

2.3 REGIONAL POLICY

M4 CORRIDOR AROUND NEWPORT (2014)

2.3.1 On 16th July 2014, on behalf of the Welsh Government, Edwina Hart AM CStJ MBE Minister for Economy, Science and Transport, publicly announced the Plan for the M4 Corridor around Newport. The Plan is seeking to improve accessibility for people, Welsh goods and services to international markets by addressing capacity and resilience on the main gateway into South Wales, which is the M4 Corridor. The Plan includes:

- A new section of motorway being built between Junctions 23 and 29 south of Newport
- Complementary measures, to include:
- Reclassifying the existing M4 between Magor and Castleton
- An M4/M48/B4245 Connection
- Providing cycle friendly infrastructure
- Providing walking friendly infrastructure

2.3.2 The Welsh Government's preferred strategy comprises the construction of a new section of 3-lane motorway mainly following the protected TR111 'Black Route', between Junctions 23 and 29 (Magor to Castleton), including a new crossing of the River Usk south of Newport.

2.3.3 The TR111 route to the south of Newport has remained protected for planning purposes since April 2006. The alignment of this proposed new section of motorway has been developed following extensive consultation, investigation, and analysis. The Preferred Route Context Plan is included in Appendix A of this report.

A CARDIFF CAPITAL REGION METRO: IMPACT STUDY (2013)

2.3.4 In October 2013, a report to the Minister for Economy, Science and Transport presented the vision for Metro and some of its wider economic and regeneration benefits. This Impact Study identified that public transport measures are needed to reduce pressure on the main transport artery in south Wales. One scheme identified the opportunity to introduce new stations and services on the electrified relief lines between Cardiff and Severn Tunnel Junction, including Magor. This would provide major accessibility benefits to communities along the route.

2.3.5 Following the Impact Study, The Welsh Government invested £77m in transport improvements across the region under Metro Phase 1. The extension to Ebbw Vale town and further capacity enhancement on that line, as well as other station enhancements across the network, are already complete or in progress.

A CARDIFF CAPITAL REGION METRO: UPDATE REPORT (2014)

2.3.6 Further work was commissioned to identify how to make the Metro a reality following the 2013 publication. This work focused on examining the feasibility of the interventions and the affordability of both potential new and existing public transport operations.

2.3.7 The Metro vision focuses on enhanced mobility, greater accessibility to jobs and services and economic development. The report also identifies a number of strategic Metro projects that justify further detailed analysis and testing against alternative options.

2.3.8 The possible interventions that have been identified as part of this study include the potential use of the relief lines for the Great Western Mainline between Cardiff and Severn tunnel junctions for additional services, served by new stations and park and ride provision.

2.4 LOCAL POLICY

MONMOUTHSHIRE LOCAL DEVELOPMENT PLAN

2.4.1 The Monmouthshire County Council Local Development Plan (LDP) 2011-2021 was adopted on 27 February 2014, replacing the Monmouthshire Unitary Development Plan (UDP), to become the adopted development plan for the County (excluding that part within the Brecon Beacons National Park).

2.4.2 The LDP seeks to deliver sustainable development through a framework for the use of land and for the protection of the environment. The LDP determines the level of provision and location of new housing, employment and other uses and sets the framework for considering all land use proposals during the plan period.

2.4.3 The Council considers that the need for new housing allocations can be met by strategic sites in the County's larger settlements. Policy S3 identifies the Strategic Housing Sites, including Rockfield Farm in Undy (SAH5), and the adjoining site Land at Vinegar Hill (SAH6). These sites are shown in LDP Magor/Undy Map, which is attached in Appendix B.

2.4.4 The LDP identifies that, although there are constraints to the extent the site can be developed, the Rockfield Farm Greenfield site is allocated for a mixed use residential and employment development. It states that planning permission will be granted on this site provided around 270 dwellings are built during the planned period and that provision is made for industrial and business development (Class B1 of TACP (Use Classes) Order).

2.4.5 Policy S16 (Transport) outlines that, where appropriate, all development proposals should promote sustainable, safe forms of transport that reduce the need to travel, increase provision for walking and cycling, and improve public transport provision. This will be facilitated by:

- Reducing the need to travel, especially by car
- Favouring development close to public transport facilities
- Promoting public transport, walking and cycling
- Improving road safety
- Minimising the adverse effects of parking
- Improving public transport links between the County's main towns and other key settlements in the region

2.4.6 In line with Strategic Policy S16, Policy MV1 (Proposed Developments and Highway Considerations) seeks to ensure that development proposals that would generate unacceptable additional traffic growth or adversely affect the safe and efficient operation of the highway system are not permitted. All planning applications for developments that are likely to have a significant impact on trip generation and travel demand must be accompanied by a Transport Assessment. This should include a Transport Implementation Strategy for the development detailing the measures proposed to improve access by public transport, walking and cycling and reduce the number and impacts of car journeys associated with the proposal.

2.4.7 Policy MV1 also seeks to ensure that development proposals make satisfactory provision for access, circulation, and parking. The Monmouthshire Parking Standards SPG (January 2013) should be used to determine the adequacy of proposed parking provision. These standards provide detailed parking requirements according to land use and type of development and promote traffic management and the reduction of car dependency.

2.4.8 Policy MV2 (Sustainable Transport Access), the LDP seeks to ensure that new developments can be served by sustainable transport facilities and contribute to sustainable transport provision. The LDP recognises that TAs provide an important basis for the preparation of Travel Plans. These can be utilised to achieve the integration of new development with sustainable transport facilities required and therefore contribute to reducing traffic growth and reliance on the private car.

2.4.9 Policy MV2 also identifies that development should link into the existing or proposed public rights of way, walking, cycleway, and green infrastructure networks and this will be reflected in the layout and conditions / obligations on any permission granted.

2.4.10 Policy MV3 (Public Rights of Way) seeks to protect and enhance the rights of way network and the Council will use planning conditions and planning obligations as necessary to secure such protection or enhancements.

2.4.11 Policy MV4 (Cycleways) identifies that cycleways will be permitted where they provide improved opportunities for sustainable travel or recreational cycling, subject to no adverse impact on pedestrian / cyclist safety and subject to detailed planning considerations.

2.4.12 Further to the transport considerations outlined in the LDP, the General Design Considerations of developments is established. Policy DES1 identifies that development proposals will be required to ensure a safe, secure, pleasant and convenient environment that is accessible to all members of the community, supports the principles of community safety and encourages walking and cycling. It also recognises that the design should maintain reasonable levels of privacy and amenity of occupiers of neighbouring properties.

MONMOUTHSHIRE LOCAL TRANSPORT PLAN

2.4.13 The Monmouthshire Local Transport Plan (LTP) was approved by Welsh Ministers in May 2015. The plan outlines the key transport issues relevant to the county, the solutions that have been identified to address them, as well as the local authority's specific priorities. It includes a prioritised five-year programme of projects the council wishes to see delivered within between 2015 and 2020, and medium and longer term aspirations up to 2030.

2.4.14 The programme outlined in the LTP includes walking and cycling infrastructure, bus network, station and highways improvements, Cardiff Capital Region Metro schemes, 20mph limits, and road safety schemes. In accordance with the guidance, it does not contain specific rail service and trunk road proposals.

2.4.15 Priority 1 of the prioritised programme (Table 3.1 in the LTP – Metro-related projects) is for the Severn Tunnel Junction access & interchange improvements scheme. The proposals includes improved bus, cycle and pedestrian access to station, information provision and signage, cycle storage, expansion of park & ride site, construction of new link from B4245 to expanded park & ride site. The Metro programme was identified as the funding source for this in the LTP.

2.4.16 Priority 4 of the prioritised programme is for the Magor & Undy new walkway rail station – access & interchange improvements scheme. This identifies that advanced proposals for a unique community walkway station for Magor & Undy. It is proposed for the station to incorporate a community centre, active travel access measures, information provision and signage, integration with buses and a traffic management scheme for Magor with Undy. Funding sources have been identified as MAGOR crowdfunding / MCC for study; Metro programme / Developer contributions / New Stations Fund.

2.4.17 Priority 14 of the prioritised programme (Table 3.2 in the LTP) is the Magor & Undy Active Travel Network scheme. This involves developing and implementing an active travel plan for Magor & Undy to provide travel links between residential areas and the town centre, schools and leisure facilities and surrounding areas/outlying villages. This includes a Rogiet to Magor footway/cycleway, which will provide a continuous sustainable route between Caldicot and Newport along the B4245 and A4810 corridors. Funding sources have been identified as Active Travel / Local Transport Fund, Sewta / MCC, and Network Rail.

2.4.18 Delivery of proposals featured in the LTP will be subject to sufficient funding being available from external grant sources and from the Council's own budgets. The LTP will be the primary reference for bids for annual capital funding from the Welsh Government for transport infrastructure.

3 EXISTING CONDITIONS

3.1 INTRODUCTION

3.1.1 This section provides an overview of existing conditions near the proposed development site and the surrounding area. It provides details of the site's location, its proximity to local facilities and amenities, and its accessibility by walking, cycling, and public transport. This section also considers the operation of the local highway network, and summarises a review of local Personal Injury Collision data.

3.2 SITE LOCATION

3.2.1 The development site is located to the east of Undy, south of the M4. It is approximately 5km west of Caldicot and 15km east of Newport, as illustrated in Figure 1. The M4 provides access to other areas in South Wales including Cardiff and Swansea, Bristol, and London.

Figure 1: Site Location

3.2.2 The site is moderately open to local and long distance views, including towards the Caldicot levels and Severn estuary.

3.3 SITE DESCRIPTION

3.3.1 The Rockfield Farm site is located to the north east of the Monmouthshire villages of Magor and Undy in southeast Wales, as illustrated in Figure 2.

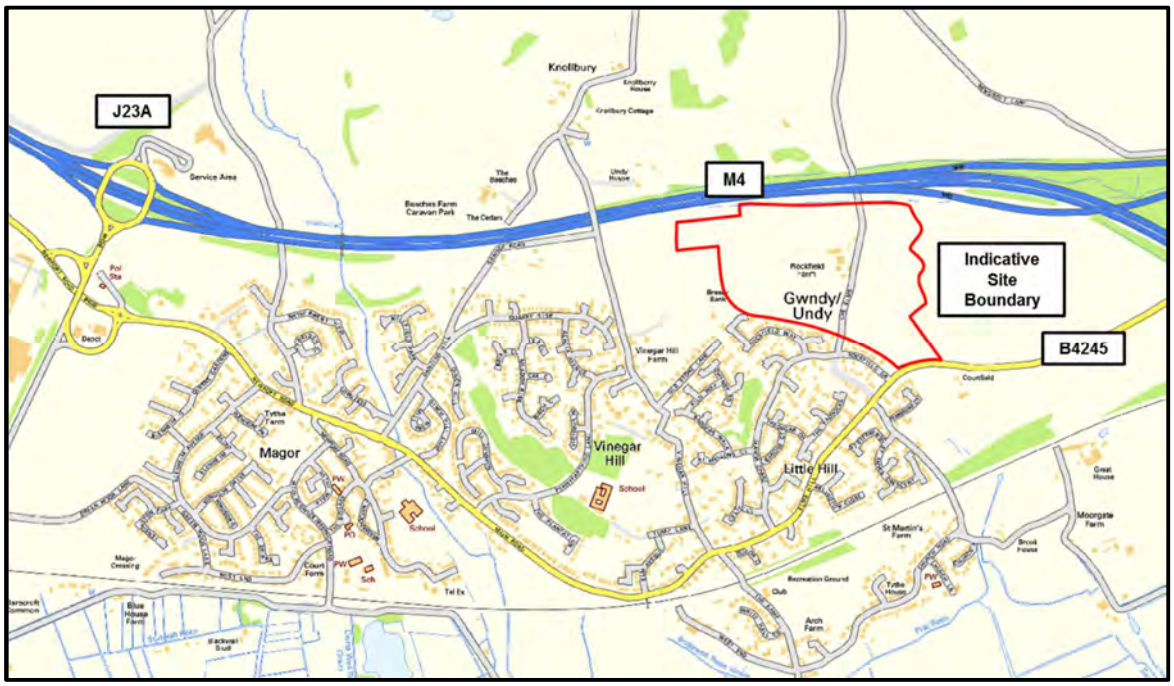
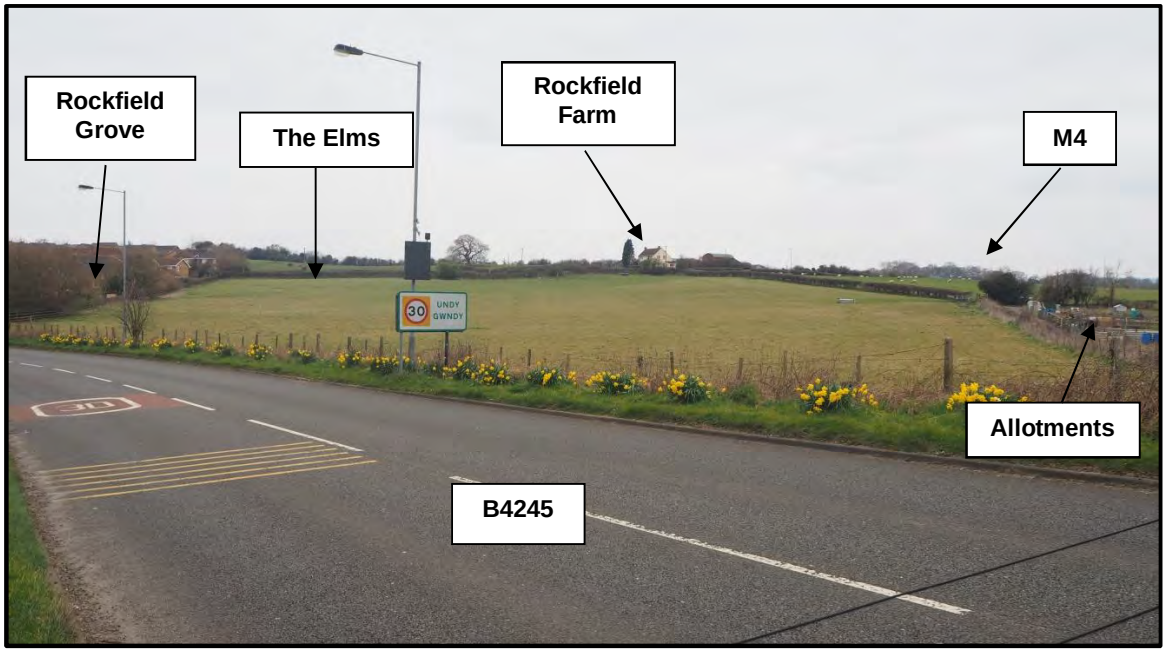


Figure 2: Indicative Site Boundary

3.3.2 The site is currently used as a working sheep and cattle farm. It consists of a farmyard with nine buildings in the centre of the site, which are accessed from a small country lane that bisects the site, called The Elms. The Greenfield development site is bounded by residential properties on Rockfield Grove and Rockfield Way to the south, the M4 motorway to the north, agricultural land to the east and west, and allotments to the southeast, as shown in Photograph 1.



Photograph 1: Eastern part of the site from the B4245 (looking northwest)

3.3.3 The western part of the site includes a Site of Importance for Nature Conservation (SINC). This can be seen in Photograph 2. Although this does not have statutory protection it is considered to be of conservation value and will not be built upon as part of the development proposals.

Photograph 2: Western part of site from Rockfield View (looking northeast)

3.4 LOCAL HIGHWAY NETWORK

B4245

3.4.1 The southern boundary of the development site is formed by the B4245, on the approach to Undy from the east, as shown in Photograph 3.

Photograph 3: B4245 approach to Undy from the East

3.4.2 The B4245 is a locally strategic east/west route that links a number of towns and villages, including Rogiet and Caldicot to the east, and Undy, Magor, Wilcrick, Underwood, and Llanmartin to the west. The B4245 joins onto the A48 at both ends, near Langstone to the west and Parkwall to the east.

3.4.3 The B4245 is a single carriageway with a speed limit of 30mph in the built up area, including through Undy and Magor. The speed limit increases to National Speed Limit for single carriageway roads (60mph) as the road continues east towards Caldicot, as shown in Photograph 4.

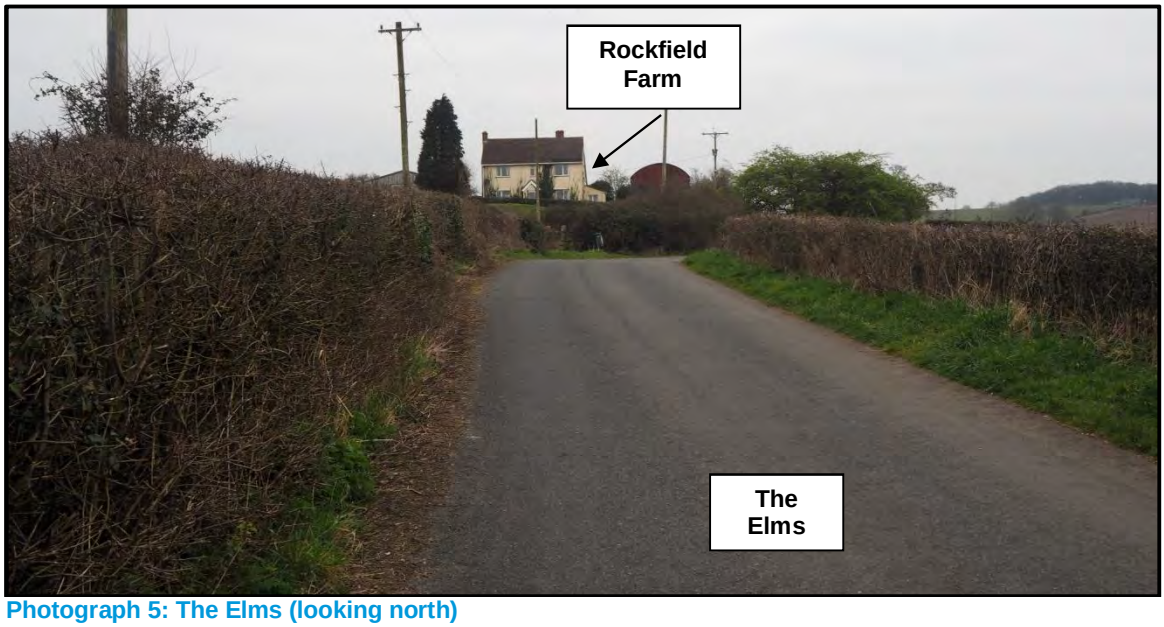
Photograph 4: B4245 leaving Undy from the West

3.4.4 To the immediate west of the development site lies Undy, and Magor is approximately 1.7km west via the B4542. Junction 23A of the M4 motorway is located approximately 3km west of the development site, accessed via the B4245.

3.4.5 Rogiet is situated approximately 2.3km east of the development site. The Severn Tunnel Junction railway station, the closest railway station to the site, is located to the south of Rogiet. This station has a large car park and provides services to Bristol, Gloucester, Newport, and Cardiff. The larger town of Caldicot is located approximately 5km east of the development site. Without a convenient link to the motorway network, a large number of vehicles travelling between Caldicot and Severn Tunnel Junction, and Newport and Cardiff, use the B4245 to access the M4 at Junction 23A.

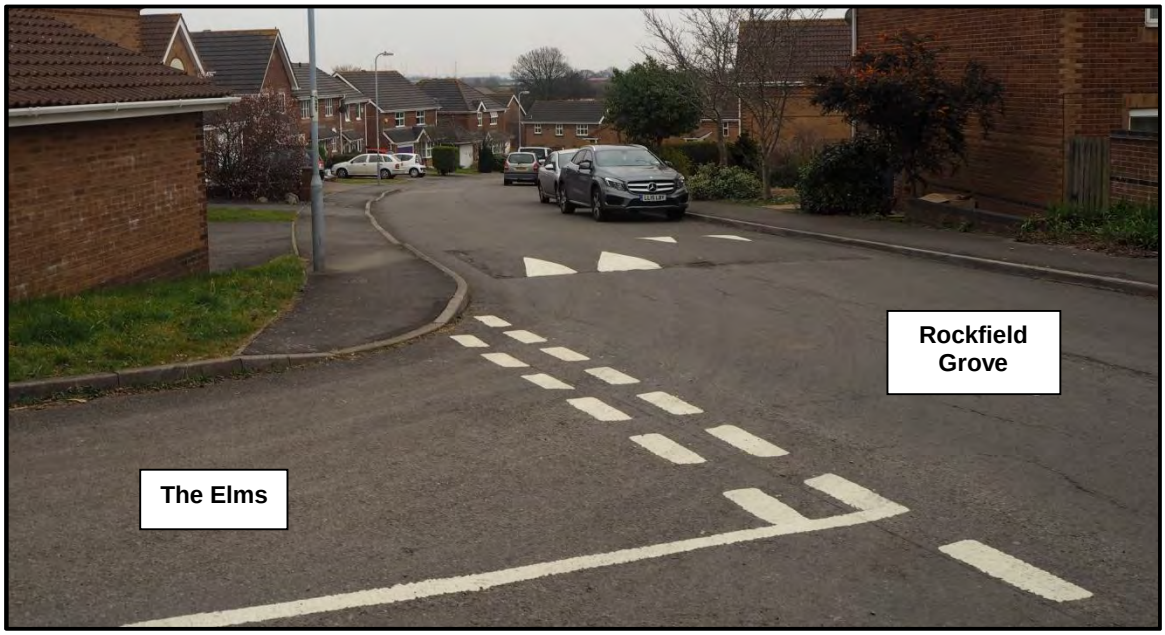
THE ELMS

3.4.6 The proposed development is bisected by The Elms. This is a narrow single carriageway road, as shown in Photograph 5.



Photograph 5: The Elms (looking north)

3.4.7 The Elms is currently accessed to the south via Rockfield Grove, shown in Photograph 6. Prior to building the residences on Rockfield Grove, The Elms had a junction with the B4245. This has since been stopped up, although pedestrian and cyclist access has been maintained.



Photograph 6: Rockfield Grove junction with The Elms

3.4.8 North of the existing residential estate, The Elms continues past Rockfield Farm underneath the M4 motorway via an underpass. The lane is rural in character, with an inconsistent width and no footways. The Elms is used to access several rural communities, including St. Bride's Netherwent, Carrow Hill, and Five Lanes, as well as further agricultural properties.

ROCKFIELD GROVE AND MANOR CHASE

3.4.9 The main route through the residential estate to the west of the development is Rockfield Grove, which then continues as Manor Chase approximately 230m west of The Elms. There are several cul-de-sacs branching from this main route. Both of these roads have junctions with the B4245 with right-turn ghost lanes. The roads are both subject to a 30mph speed limit, and are traffic calmed with speed cushions and road narrowings. The junctions are shown in Photograph 7 and Photograph 8 respectively.

Photograph 7: Rockfield Grove junction with the B4245

Photograph 8: Manor Chase junction with the B4245

3.4.10 Vinegar Hill is a residential street located approximately 700m west of the Rockfield Farm development site, accessed via a priority T-junction from the B4245. Like The Elms, Vinegar Hill links Undy with villages to the north. It is a narrow single carriageway road with the character of a rural lane. As shown in Photograph 9, Vinegar Hill is 'Unsuitable for heavy goods vehicles'. It is also signed as 'No access to residential developments'.

Photograph 9: Vinegar Hill junction with the B4245

3.4.11 Pennyfarthing Lane is a residential street located approximately 1.4km west of the site, accessed via a priority T-junction with a right-turn ghost lane from the B4245. This road is used to access Undy Primary School, 200m north of the junction shown in Photograph 10.

Photograph 10: Pennyfarthing Lane junction with the B4245

3.4.12 Dancing Hill is a two lane residential single carriageway, approximately 1.7km west of the site, accessed via a priority T-junction with a right-turn ghost lane from the B4245, as shown in Photograph 11.

Photograph 11: Dancing Hill junction with the B4245

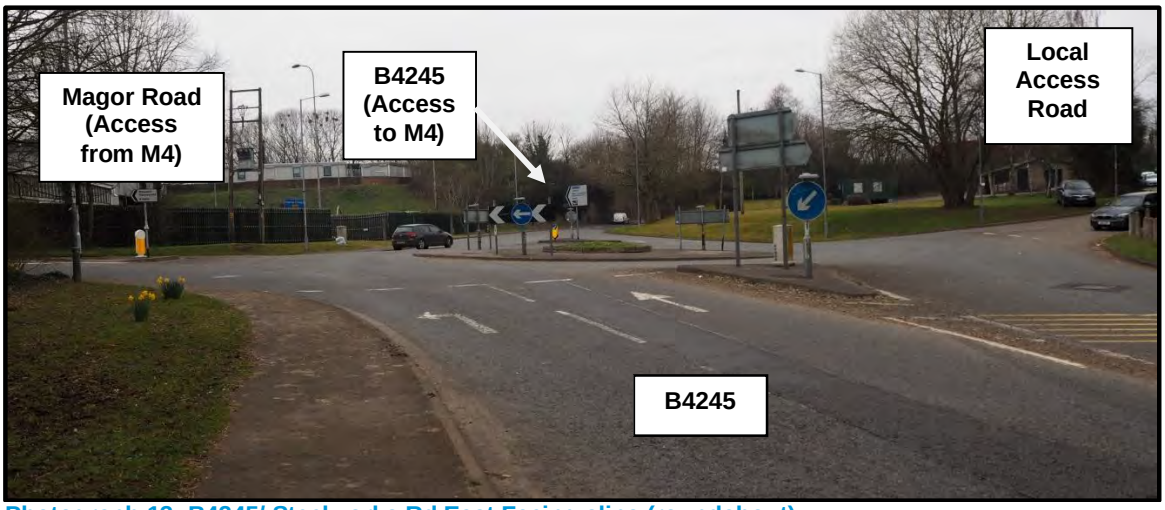
3.4.13 Dancing Hill can be used to access the northern end of Pennyfarthing Lane, via Acacia Avenue, and there are several cul-de-sacs branching from this main route. Grange Road connects onto Dancing Hill approximately 300m north of the B4245, which links Magor with villages to the north.

3.4.14 There are further residential and commercial roads that join onto the B4245 through Magor and Undy. These include Newport Road, which has two junctions on to the B4245 and is where Magor's local centre is located. The eastern B4245/Newport Road junction that connects onto The Square is shown in Photograph 12. This road can be used to access Magor Primary School, a pharmacy, Post Office, and dentist, as well as other local amenities.

Photograph 12: Newport Road eastern junction with the B4245

STEELWORKS ROAD

3.4.15 Approximately 2.4km west of the development site, there is a roundabout junction that connects the B4245 with Magor Road. This provides access from the M4 motorway via Junction 23A and the A4810. To access the M4 motorway from the development site, traffic is required to continue along the B4245. This junction is shown in Photograph 13.



Photograph 13: B4245/ Steelworks Rd East Facing slips (roundabout)

3.4.16 East of the B4245/Magor Road roundabout is a signalised junction with Newport Road. This is used to access the M4 motorway at Junction 23A. This junction is shown in Photograph 14.

Photograph 14: B4245/ Steelworks Rd West Facing slips (signalised junction)

3.5 BASE TRAFFIC

3.5.1 Traffic flow information has been obtained to establish the baseline traffic conditions along the local network and to enable junction capacity analysis of key junctions within the study area.

3.5.2 The junctions that have been assessed in this TA have been agreed with MCC as part of the scoping exercise. The junctions are as follows:

- B4245/ Steelworks Rd West Facing slips (signalised junction)
- B4245/ Steelworks Rd East Facing slips (roundabout)
- B4245/ Dancing Hill (priority junction)
- B4245/ Rockfield Grove – (priority junction)
- B4245/ Rockfield Farm Proposed Access

3.5.3 WSP | PB commissioned Tracsis to carry out the traffic surveys at the locations identified above. Classified Junction Counts with Queue Length data was collected on Tuesday 22nd March 2016, between 0730 - 0930 and 1600 – 1800. These surveys provide turning data for each of the key junctions identified in the project scope, and have been used for the impact analysis in Chapter 6 of this TA.

3.5.4 Further Classified Junction Counts were collected at the same time at the following junctions:

- B4245/ Newport Road – west of Dancing Hill (priority junction)
- B4245/ Newport Road – east of Dancing Hill (priority junction)
- B4245/ Pennyfarthing Lane (priority junction)

3.5.5 These junctions were surveyed to understand the traffic distribution that occurs along the B4245 that can be applied to the development flows.

3.5.6 Automatic Traffic Counts (ATCs) were undertaken for a 7-day period between Friday 18th March and Thursday the 24th March 2016 along the B4245 east of the development site and the A4810 south of the Steelworks Rd Slips.

3.5.7 The surveys that have been undertaken as part of this study are identified in Figure 3 overleaf.

3.5.8 The network peak hours have been identified from the ATCs as between 07:30 and 08:00 in the AM peak and between 16:30 and 17:30 in the PM peak. These peak hours have been used for the analysis in this TA.

3.5.9 The base traffic is illustrated in Flow Diagrams 1.1 and 1.2 for the weekday AM peak, and 2.1 and 2.2 for the PM peak period, attached at the rear of this report.

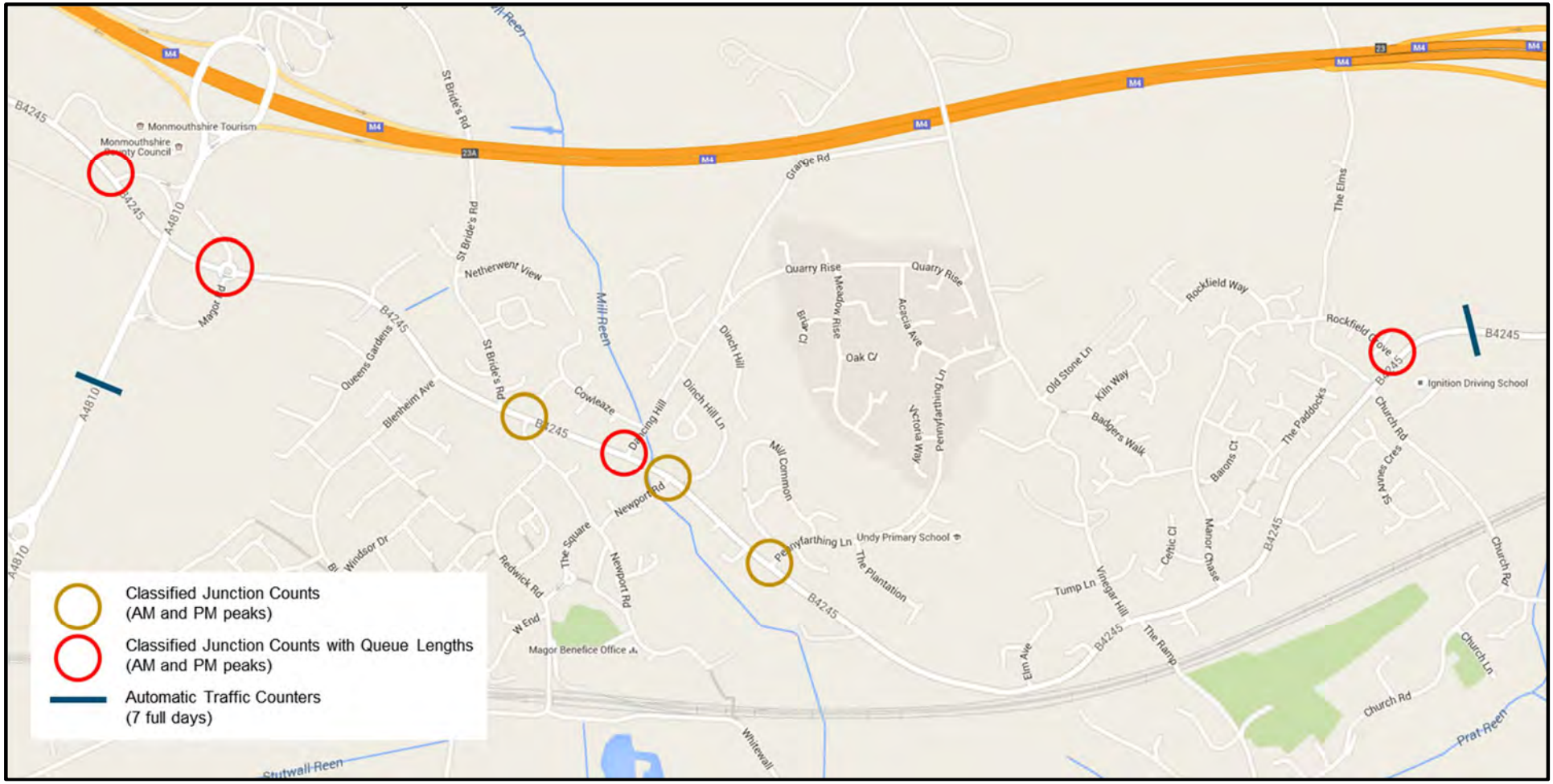


Figure 3: Traffic Surveys

3.6 PERSONAL INJURY COLLISION DATA

3.6.1 In order to establish the existing highway safety record within the area surrounding the site, a review of Personal Injury Collision (PIC) data was carried out.

3.6.2 PIC data has been obtained from Capita for the wider study area (shown in Figure 4). The study area includes the M4 motorway and Junction 23A. The data covers the five-year period from 01 March 2011 to 29 February 2016. Appendix C presents the full details of all collisions during the study period and provides a plot of the collisions in the study area.

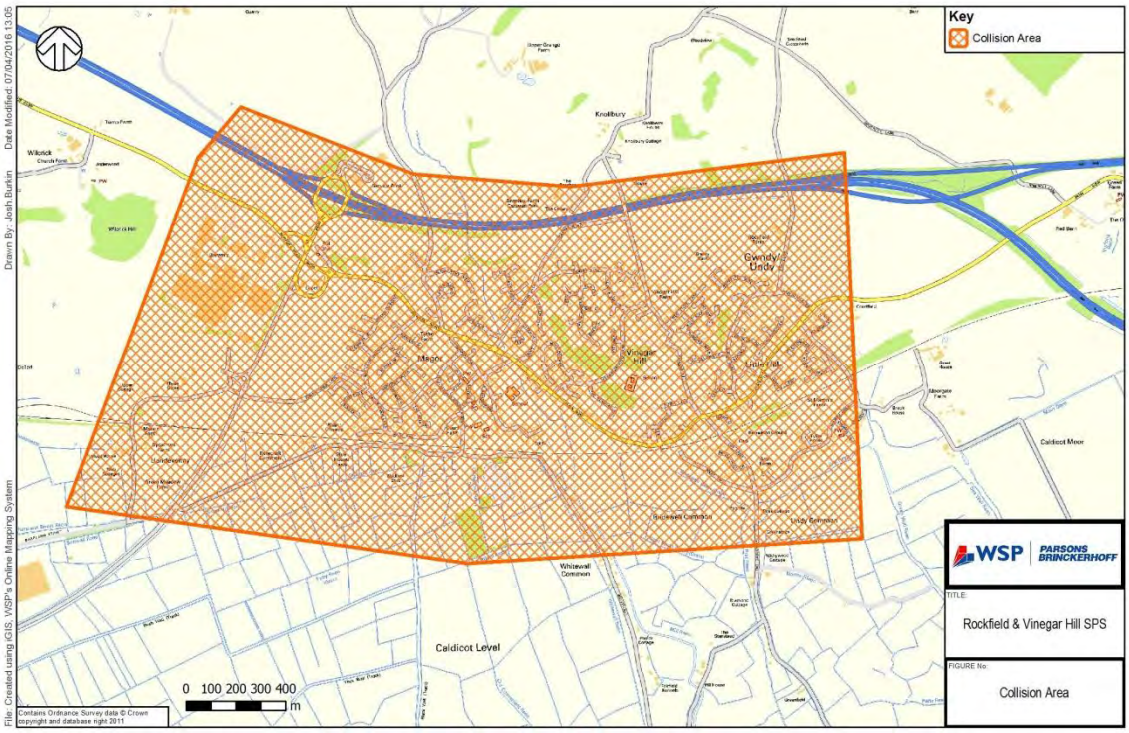


Figure 4: Collision Area

3.6.3 The PIC data shows that in the 60-month study period, 40 collisions were recorded on the highway network surrounding the proposed development site. This includes 13 collisions along the motorway, 10 at Junction 23A, and 10 along the B4245. The total collisions in the wider study area equates to an average of 8 PICs per year.

3.6.4 Analysis shows that nine collisions occurred within 1km of the site. One of these collisions resulted in a serious injury. This occurred on the B4245 approximately 600m south of the site. The record suggests two cars travelling in opposite directions collided head on.

3.6.5 The PIC data also indicates the casualty severity in each collision. 57 casualties were recorded; no collisions resulted in a fatality. Four of the collisions resulted in seriously injured casualties; the remaining 36 collisions resulted in 53 slight casualties. Table 1 provides a summary of the recorded incidents.

Table 1: Summary of Collision Data

SEVERITY	YEAR						TOTAL	RRCGB[1]
	2011*	2012	2013	2014	2015	2016*		
Fatal	0	0	0	0	0	0	0%	1%
Serious	1	1	2	0	0	0	10%	13%
Slight	3	8	9	9	5	2	90%	85%
Total	4	9	11	9	5	2	100%	100%
2011* partial annual data between 01/02/2011 and 31/12/2011 2016* partial annual data between 01/01/2016 and 31/01/2016								

3.6.6 The PIC records show the highest number of collisions occurred in 2013. The total number of collisions in 2012, 2013, and 2014 were higher than the average for the five-year period (8.0). There was a dip in the number of collisions recorded in 2015. The variation in the frequency of collisions in 2011 and 2016 may be due to the partial annual data supplied for both these years.

3.6.7 A summary of the casualties according to class is shown in Figure 5.

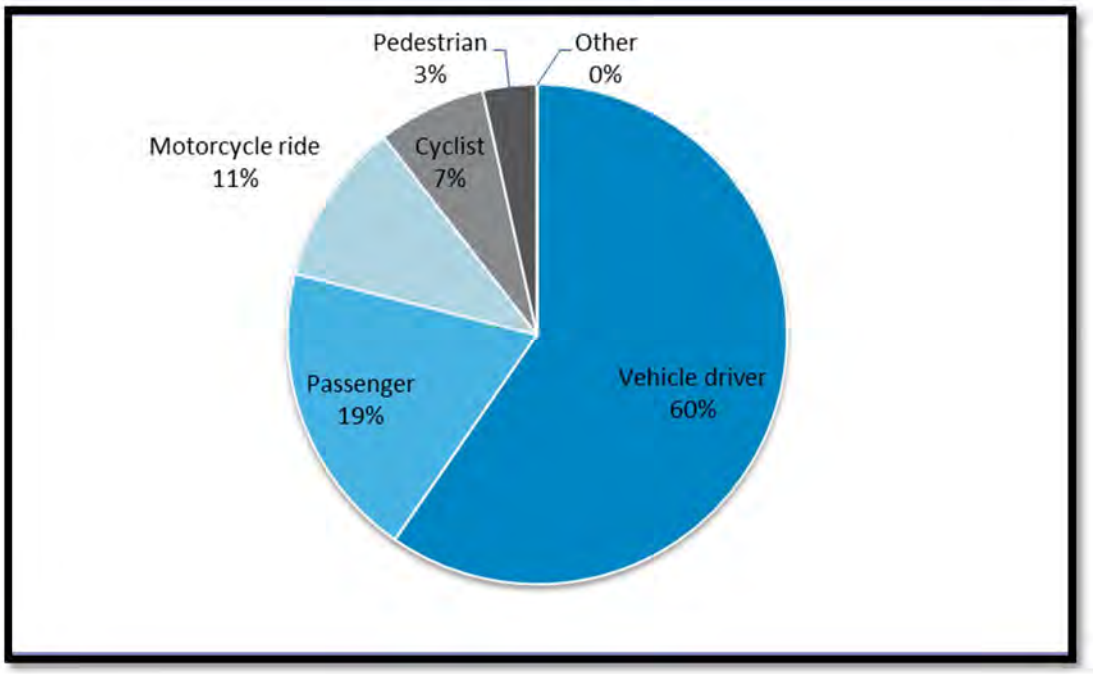


Figure 5: Casualty Class

3.6.8 Analysis shows that 60% of recorded casualties were drivers of vehicles. Motorcycle/motor scooter riders make up 11% of the total casualties resulting from collisions in the five-year period. 7% of casualties were cyclists, including one collision that involved three pedal cyclists and one light goods vehicle.

[1]Reported Road Casualties Great Britain, 2014: *Table RAS10001 Reported accidents by speed limit, road class and severity, Great Britain, 2014* [Available online at: https://www.gov.uk/government/statistical-data-sets/ras10-reported-road-accidents#table-ras10001]

VULNERABLE ROAD USERS

3.6.9 Two of the casualties resulting from the collisions were pedestrians. Both collisions occurred in fine weather with a dry road surface, one in daylight in February 2012, the other in darkness in July 2013.

3.6.10 The first collision involved a car making a left turn manoeuvre, colliding with an elderly pedestrian on a zebra crossing after the corner. This occurred at the junction between West End and Redwick Road in Magor, approximately 1.5km south-west of the development site.

3.6.11 The second collision involved a pedestrian who walked out in front of a vehicle on Queens Way in Llandevenny, approximately 2.7km south-west of the development site. The records suggest the pedestrian was intoxicated.

3.6.12 Two collisions involved cyclists; these resulted in one serious injury and three slight injuries respectively. The records suggest the collision with multiple cyclist casualties occurred where a light goods vehicle attempted to overtake a group of cyclists and collided with one of the group, who in turn collided with the other two. This occurred on Whitewall, approximately 1.4km south-west of the site.

3.6.13 The other collision involving a cyclist occurred on the B4245, approximately 1.7km west of the site. The record suggests that a cyclist who was travelling eastbound pulled over and whilst dismounting was knocked over by a car that was also travelling eastbound.

COLLISION SUMMARY

3.6.14 The study area encompasses a large boundary around the proposed development site, and has recorded an incident rate of 40 collisions within a five-year period. This equates to an average of eight collisions per year. The incident rate is inflated by the M4 corridor being included in the study area.

3.6.15 Analysis shows that nine collisions occurred in the study period within 1km of the site on the local highway network, one of which resulted in a serious injury. The collision analysis indicates that the majority of the collisions that occurred on the surrounding highway network were not in the immediate vicinity of the site. None of the collisions occurred on The Elms or Rockfield Grove.

3.6.16 A number of collisions occurred on the B4245 south of the site. This review of existing collision data has not identified an existing road safety issue on The Elms or the B4242. It is acknowledged that a change in land-use in the area is likely to increase activity and could have an impact on the occurrence of collisions in the area. This should be monitored following the opening of the proposed development to identify any trends or safety issues.

3.7 SUSTAINABLE TRANSPORT ANALYSIS

WALKING

3.7.1 Pedestrian facilities associated with the B4245 are available from where the built-up area of Undy commences south of the development site. The B4245 has street lighting, with footways on both sides of the carriageway through the built up area west of the site. The footway ends approximately 40m east of Rockfield Grove, a few metres shy of the development boundary. Grass verges bound the carriageway to the east of the site, as shown in Photograph 15.

Photograph 15: B4245 adjacent Rockfield Grove (looking east)

3.7.2 There is a formalised pedestrian crossing point with dropped kerbs, tactile paving, and a refuge island at the end of the footway. This is immediately west of the development site, where the carriageway is approximately 10m wide. This can be seen in Photograph 16.

Photograph 16: B4245 adjacent Rockfield Grove (looking west)

3.7.3 West of the Rockfield Grove junction, there are footways on both sides of the B4245 for approximately 80m. Beyond this point, the footway continues south of the carriageway only, and a grass verge continues north of the carriageway for 300m. From this point west, the footway continues on both sides of the carriageway throughout Undy and Magor, with regular formal crossing points. This route can be used to access local amenities in Magor Village Centre, a summary of which is provided in Table 3 on page 33.

3.7.4 Severn Tunnel Junction railway station in Rogiet is approximately 2.6km east from the development site along the B4245, and the lack of footway provision presents a barrier to walking. As the IHT[2] suggest that a maximum acceptable walking distance for commuting is 2km, this is beyond acceptable walking distance.

3.7.5 A priority within the MCC Local Transport Plan is to provide a Rogiet to Magor footway/cycleway to provide a continuous sustainable route between Caldicot and Newport. The scheme may include new/improved cycle lanes/paths/contraflows, footpaths, junction/crossing facilities, cycle parking/storage, route signage, dropped kerbs/continuity across side roads.

3.7.6 Within the residential area west of the development site, there are footways adjacent to all roads. This includes Rockfield Grove and Rockfield Way. The Elms, which bisects the development site, does not have any provision for pedestrians.

3.7.7 There are a number of Public Rights of Way near the proposed development site. A public footpath commences on the northern B4245 verge at the eastern boundary of the development site. The path continues north from the B4245 adjacent the allotments, across a field within the site to The Elms. Beyond The Elms, the path continues west across fields within the western half of the site, and includes a connection to Rockfield View. This is shown in Figure 6 overleaf.

CYCLING

3.7.8 The landscape in the central Magor and Undy area is relatively flat, including the alignment of the B4245. However, there is no specific cycle provision along this route; it is generally less than 7.3m wide with relatively high traffic numbers, presenting a barrier to cyclists.

3.7.9 National Cycle Network (NCN) Route 4 (The Celtic Trail) is accessible via Church Road, approximately 500m south from Rockfield Grove. This provide a largely traffic-free route to the local railway station (Severn Tunnel Junction) and Caldicot to the east, and to employment located off steelworks road and beyond to Newport to the west.

3.7.10 NCN Route 4 is a long distance route between London and Fishguard via Reading, Bristol, and Swansea. It is a series of on and off road cycle sections linking the site with Chepstow to the east and Newport to the west. This is shown in Figure 7 overleaf.

[2] IHT, Guidelines for Providing Journeys on Foot, 2000

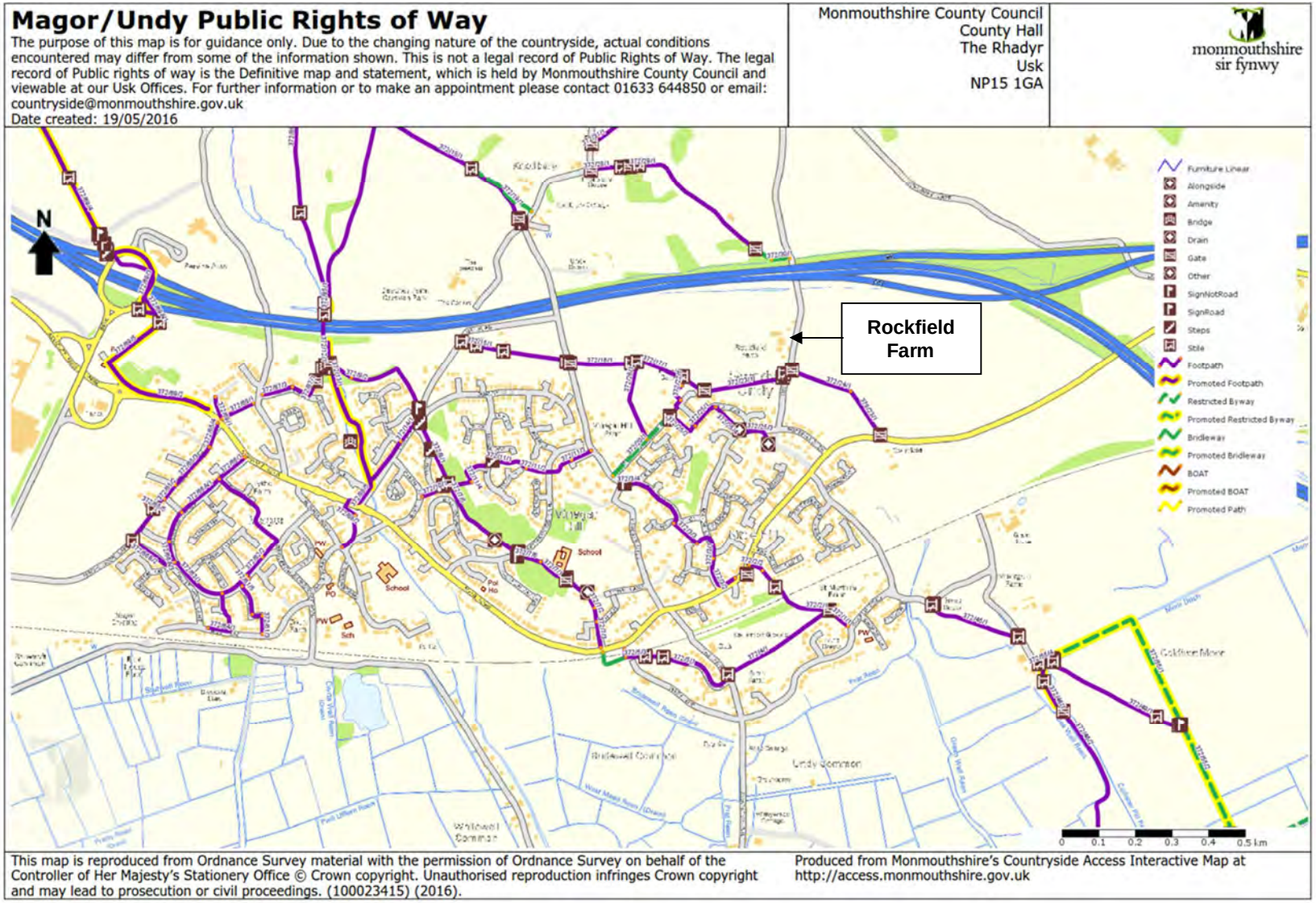


Figure 6: Public Rights of Way (source: access.monmouthshire.gov.uk)

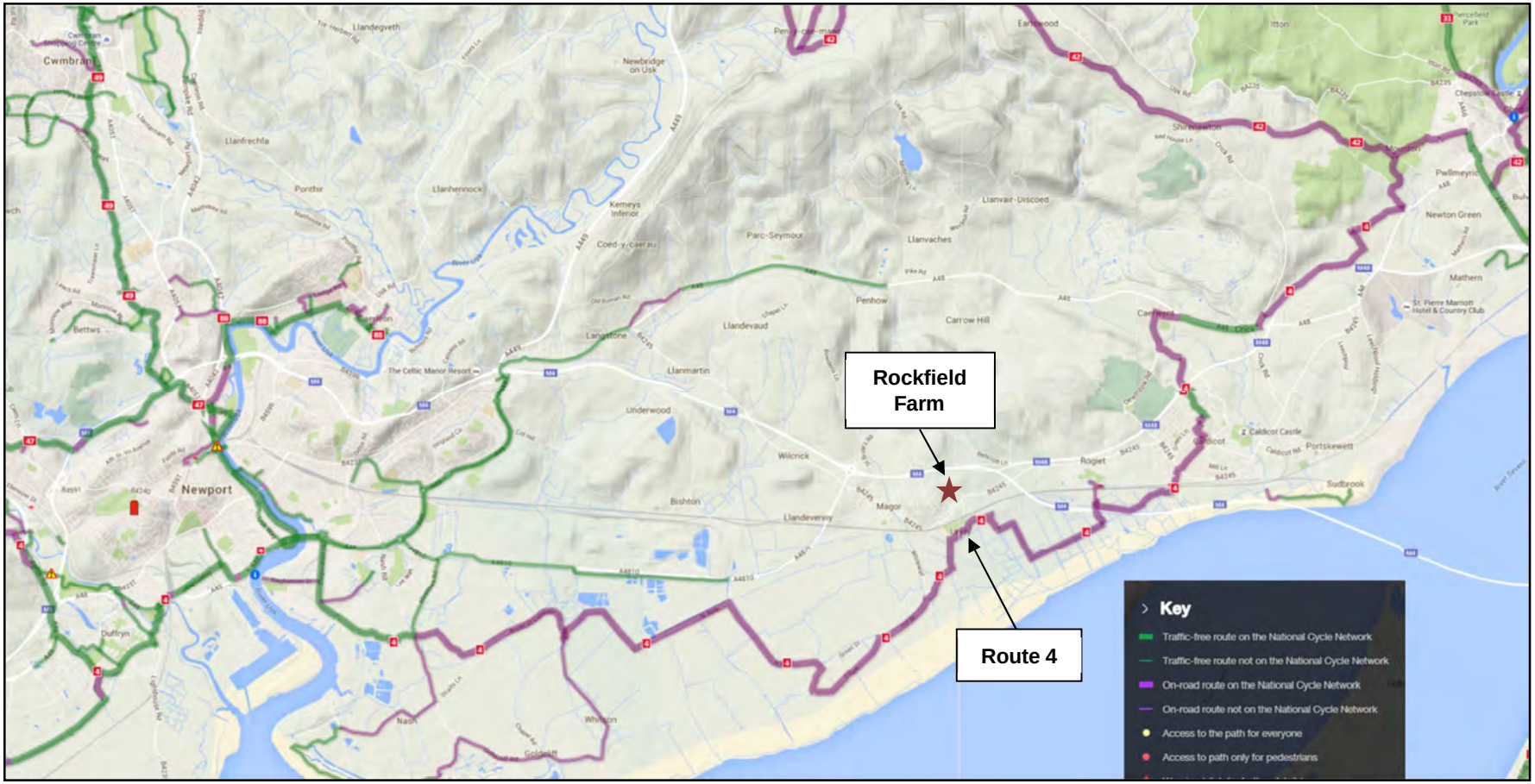


Figure 7: Cycle Routes (Source: Sustrans.org.uk)

NETWORK DEVELOPMENT

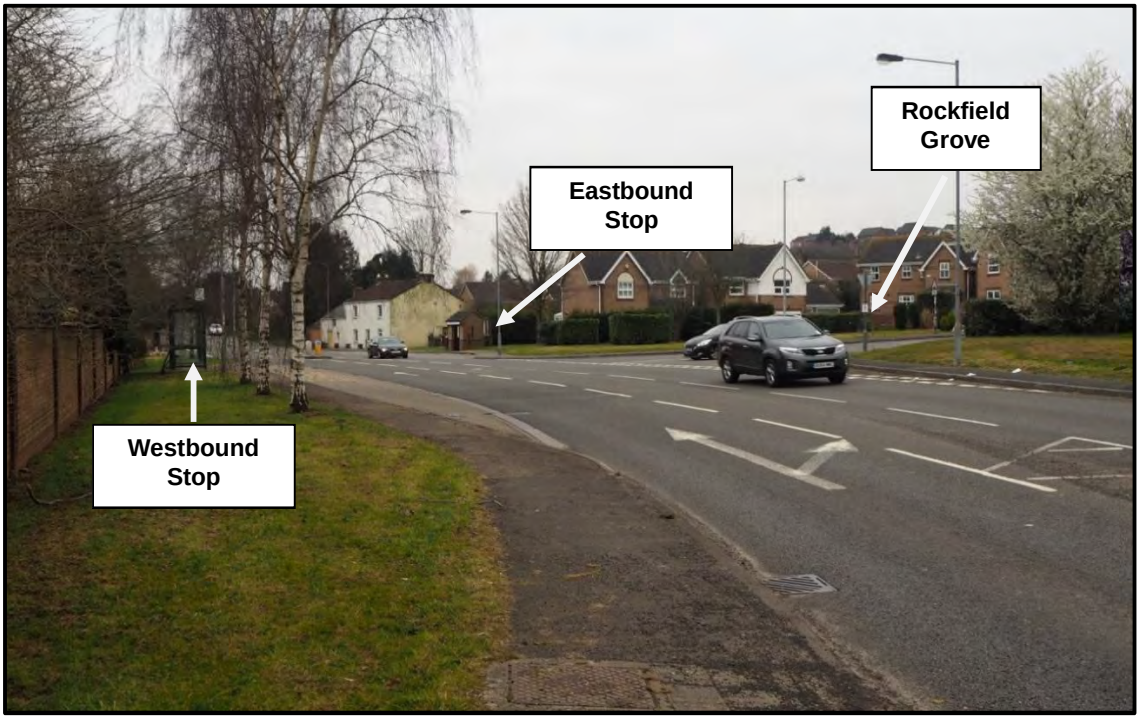
3.7.11 MCC has submitted its first set of Existing Route Maps to Welsh Government on 22 January 2016. The Caldicot – Magor maps have identified a footpath (away from the road) as good for pedestrians from Main Road to Chapel Terrace. The existing pedestrian routes are included in Appendix D. No cycle routes were identified. The council is now awaiting approval of the maps by Welsh Government.

3.7.12 MCC has to submit its first set of Integrated Network Maps to Welsh Government by 24 September 2017. These will set out MCC's plans for improving and promoting active travel over the following 15 years. The maps will show proposed future networks of key walking routes and key cycling routes. They will show where the proposed routes fall short of the Design Guidance standard, and will include 'shovel ready' schemes for delivery in the next couple of years, schemes for delivery in the medium term, and longer-term schemes of a more aspirational nature.

3.7.13 It is considered that with the Active Travel Act, as well as priorities identified in the LTP, walking and cycling in Magor and Undy will improve significantly over the plan period.

TRAVEL BY BUS

3.7.14 There are bus stops on both sides of the B4245 adjacent the development site, south of Rockfield Grove, as shown in Photograph 17. Both are located in a lay-by, with 'Bus Stop' carriageway markings. Each stop has been upgraded to the regional standard, which includes a raised boarding platform with tactile edging to assist less mobile users. Both of the stops have timetables on display, and there are pedestrian crossing points to the east and west.



Photograph 17: Bus Stops on B4245

3.7.15 The bus stops on the B4245 are within the recommended walking distance of 400m, as outlined by DfT guidance[3]. Both stops have sheltered seating for users (brick built at the eastbound stop and glazed shelter at the westbound stop), as shown in Photograph 18 and Photograph 19.

Photograph 18: Eastbound Bus Stop Serving the Development Site

Photograph 19: Westbound Bus Stop Serving the Development Site

3.7.16 The stops are served by Newport Bus 74 service, and First Bus X7 service. Overviews of these routes are shown in Figure 9 and Figure 8.

[3] DfT LTN 1/04, Policy, Planning and Design for Walking and Cycling

3.7.17 The First Bus X7 service serves Bristol to Newport, via Cribbs Causeway and Chepstow. This services only routes through Undy and Magor once per day Monday to Friday, towards Bristol in the AM peak, and towards Newport in the PM peak. The Saturday and Sunday service on this route does not travel via Magor.

Figure 8: X7 Severn Express Route Overview (source: First Bus, Accessed March 2016)

3.7.18 Newport Bus service 74 merged with the 21 service to Underwood in September 2015, and serves Newport to Chepstow on a 60-minute frequency. It departs from Newport between 0600 and 2000 and from Chepstow between 0720 and 2120 Monday to Friday. The service is similar on Saturday, except the last service from Newport departs at 19.20 and from Chepstow at 19:40. The service alternates via Spytty Retail Park and Chepstow Road.

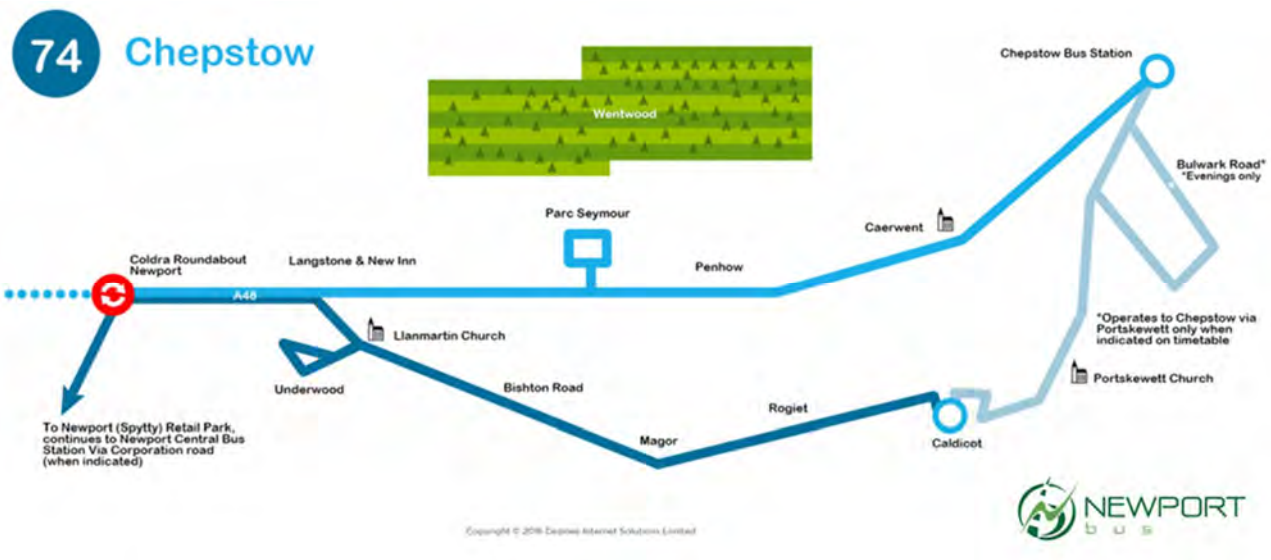


Figure 9: Newport Bus Service 74 Route Overview (source: Newport Bus, Accessed April 2016)

3.7.19 The Newport Bus service 75, which travelled from Magor to Chepstow, via Caldicot and Caerwent was withdrawn in March 2016.

GRASS ROUTES

3.7.20 MCC operates a Grass Routes transport scheme. This is a responsive, flexible bus service that makes trips on request. It runs low floor, fully accessible vehicles with volunteer drivers on a membership basis that is open to all members of the community. The cost of membership is a one off payment of £5 per household of up to four members.

3.7.21 To book a journey on the bus with the Grass Routes Co-ordinator, members of the scheme need to call a free phone number that operates from 9am to 4.30pm at least 24 hours in advance.

3.7.22 There are scheduled routes for each day between main towns. These are flexible depending on demand. The bus operates between 9am and 4.30pm depending on route, Monday to Friday, serving all main Towns of Monmouthshire and outlying areas. Each journey booked cost £2.75 for adults and £1.35 per child.

TRAVEL BY RAIL

3.7.23 The site is approximately 2.6km from Severn Tunnel Junction railway station in Rogiet along the B4245. This is approximately a 30-minute walk or an 8-minute cycle; however, many potential users would not consider this route safe or comfortable. Using NCN Route 4, the station is approximately 4.5km.

3.7.24 The DfT Policy[4] recommends that the mean average length for general walking journeys is approximately 1km and 4km for cycling, and the IHT[5] suggest that a maximum acceptable walking distance for commuting and school trips is 2km. The train station is not considered to be within an acceptable walking distance. Provided improvements are made to the cycling environment along the B4245, it is within an acceptable distance for cyclists.

3.7.25 The station is open 24hrs, with the ticket office open Monday to Friday between 6.30 and 10.30. The station has an NCP car park with 114 spaces, with charges starting at £3.40 for 24 hours. There is also sheltered storage for 10 bicycles.

3.7.26 Rail services from here connect the site to places further afield, including Cardiff, Newport, Bristol, and Gloucester. The number 74 bus, as discussed above, provides a service between the development site and the B4245 through Rogiet, which is a 10-minute walk from the station.

3.7.27 Rail services are provided by Arriva Trains Wales and GWR, as summarised in Table 2 below.

Table 2: Summary of Rail Services

ROUTE	FREQUENCY	OPERATOR
Maesteg / Cardiff Central to Gloucester / Cheltenham Spa	Hourly Service	Arriva Trains Wales
Cardiff Central to Taunton	Hourly Service Monday to Saturdays only	GWR

3.7.28 The Monmouthshire LTP identifies Magor and Undy Walkway Station as a priority 4 item (of 9 schemes). This is in addition to the scheme being referenced in the National Transport Finance Plan, Network Rail's draft Wales Route Strategy, and in the current Metro Phase 2 list of optional schemes.

3.7.29 The proposed location is on the South Wales Mainline, accessed from the B4245 in between the villages of Magor and Undy. The site is adjacent to the local community centre, and it is intended to combine the ticket retailing facilities with the community centre. The site is approximately 1km from the development site, which is an acceptable walking distance to access public transport facilities.

3.7.30 The scheme is currently at GRIP 2 stage, with funding being sought by MCC and local community rail action group MAGOR (Magor Action Group On Rail) to take the scheme to GRIP 3. The GRIP 2 study was carried out by Mott Macdonald in April 2016 and broadly concludes the station is deliverable from an operational and constructability viewpoint. It is anticipated that subject to funding, a GRIP 3 study will be carried out in late 2016 or early 2017.

[4] DfT LTN 1/04, Policy, Planning and Design for Walking and Cycling
[5] IHT, Guidelines for Providing Journeys on Foot, 2000

3.8 LOCAL AMENITIES

3.8.1 Table 3 provides a summary of the key local facilities within proximity of the site, with the distances taken from the existing property on The Elms (Rockfield Farm). The journey times provided in the table have been based on guidance from DfT Core National Accessibility Statistics, IHT Providing for Journeys on Foot, and Manual for Streets. These documents suggest that an average person can achieve an 800-metre walk in around 10 minutes, in addition average cycling speed has been suggested as 16 km/h.

Table 3: Summary of Local Amenities

	LOCATION/FACILITY	DISTANCE	JOURNEY TIME ON FOOT	JOURNEY TIME ON BICYCLE
Within 2km	**Main Road**			
	Veterinary Clinic	1.0km	13 minutes	4 minutes
	General Store	1.5km	18 minutes	5 minutes
	Pennyfarthing Lane			
	Primary School	1.4km	18 minutes	5 minutes
	Newport Road			
	Grocery Store	2.0km	25 minutes	8 minutes
Within 4km	Takeaway	2.1km	26 minutes	8 minutes
	Restaurant/Pub	2.1km	26 minutes	8 minutes
	Primary School	2.2km	28 minutes	8 minutes
	The Square			
	Hair Salon	2.1km	26 minutes	8 minutes
	Dentist	2.1km	26 minutes	8 minutes
	Takeaway	2.1km	26 minutes	8 minutes
	Church	2.1km	26 minutes	8 minutes
	Restaurant/Pub	2.1km	26 minutes	8 minutes
	Post Office	2.2km	28 minutes	8 minutes
	Pharmacy	2.2km	28 minutes	8 minutes
Within 6km	**Caldicot**			
	Grocery Store	4.4km	55 minutes	17 minutes
	GP	4.9km	61 minutes	18 minutes
	Supermarket	5.0 km	63 minutes	19 minutes
	Bank/ATM	5.1km	64 minutes	19 minutes
	Leisure Centre	5.4km	68 minutes	20 minutes
	High School	5.5km	69 minutes	21 minutes

3.8.2 The Monmouthshire LDP acknowledges no significant concerns over the infrastructure at the Rockfield development site. Some facilities, such as a shop, primary schools, nursery, hall, and open space, are within a realistic walking distance of the site. Further amenities are available in Magor local centre, and this is reasonably accessible from the western part of the site. It would be reasonable to expect trips to these amenities to be undertaken on foot or by bicycle, except where car use is an obvious prerequisite or indeed the reason for the trip.

4 DEVELOPMENT PROPOSALS

4.1 INTRODUCTION

4.1.1 The Rockfield Farm site is allocated for mixed use residential and employment development in the LDP (policy SAH5). The LDP also outlines that the site is expected to provide amenity open space and enhanced financial contribution for community facilities in the area. It also acknowledges that there is a need to safeguard a route for a potential Magor/Undy by-pass and will also not prejudice a potential M4 Relief Road.

4.1.2 The current outline planning application proposes the following;

- → 266 new dwellings
- → 5,575m2 employment (B1) land-use
- → A new access from the B4245 near Rockfield Grove

4.1.3 Although the application is for 266 dwellings, this TA assesses the potential for up to 345 housing units as well as 5,575m^2 B1 employment uses. The development is proposed to be of a medium density, with approximately 35 units per ha. The site will comprise a mixture of one-, two-, three-, and four-bedroom detached, semi-detached, terraced houses, with a small number of low-rise flats. MCC require that affordable housing be equivalent to 25% of units with a mix of unit types. These will be spread throughout the development and be indistinguishable from market housing.

4.1.4 The design of the Rockfield Farm site also provides suitable links to the Vinegar Hill strategic housing site to the west, as well as to the wider area. This is provided through the highway design, with the primary access road providing access to the adjacent development. There will be a green corridor through the site providing a local walking/cycling network including connections to the adjacent Vinegar Hill site.

4.2 PARKING PROVISION

4.2.1 Car parking provision will be made in accordance with MCC's Parking Standards SPG (2013). This outlines that new build residential developments should provide 1 space per bedroom (up to a maximum of 3 spaces) for residents. 1 space per 5 units should be provided for visitors.

4.2.2 The master plan report and design and access statement prepared by WYG (July 2016) outlines that parking will generally be made in-plot with some properties benefiting from a private garage. Additional allowance will be made for visitor parking on street in publicly accessible locations.

4.2.3 Cycle parking provision for residential dwellings is only required for apartments. The standards state should be 1 stand per 5 bedrooms. The specific quantum of each house type has not been determined, and therefore the number of stands cannot be confirmed at this stage.

4.2.4 The parking standards for offices are dependent on the zone of the development, which can be either 'Town Centre, 'Urban', 'Countryside, or 'Deep Rural'. It is considered that this development falls into Zone 3: Countryside:

Areas, including small villages, with a few local facilities within walking distance. Motorised travel is required for most journeys, although there is some local employment. Local bus services probably exist but with limited routes and infrequent services. There is no shortage of land for parking provision within the site but the adjacent highway system offers limited opportunities to park cars.

4.2.5 The standard for office developments over 1,000m^2 within zones 2 to 4 is 1 space per 40m^2. This equates to 140 spaces. 5% of these (7 spaces) are recommended to be designated for Blue Badge holders. An additional 5% of spaces for car parking is required for motorcycle parking provision. This equates to 7 additional spaces.

4.3 HIGHWAY DESIGN

4.3.1 The design and access statement (WYG, 2016) has outlined that primary vehicular and pedestrian access will be taken from the B4245 at the south-east corner of the site. Access currently provided to The Elms from Rockfield Grove will be maintained but limited to pedestrians and cyclists to avoid its use as a rat run. The street network will be designed to provide natural traffic calming and a variety of street-edge treatments will be used to create different street characters.

4.3.2 The primary access road will be the main road for distribution of traffic through the site, both for the residential and employment areas and also allow for connection to the Vinegar Hill site to the west. This road has been designed as a priority T-junction with the B4245, a detailed design for which has been prepared by WSP | PB, and is included in Appendix H.

4.3.3 The design of the primary access road would typically consist of a 6m wide carriageway and 3m wide footways/cycle-ways to either side. There will also be alternating on-street parking/landscaping and a generous set-back of semi-private space in front of houses.

4.3.4 The internal layout of the development site will be designed to current standards, incorporating additional safety measures. The master plan outlines that the local streets within the development would consist of a corridor of approximately 21m in width. This would consist of a 5.5m wide carriageway to accommodate public transport, emergency and delivery vehicles, and 2m footways to either side. The design speed for local streets would be 20 mph.

4.3.5 The development will also include 'home zones', where streets would prioritise the needs of pedestrians and cyclists through providing a narrower corridor with less distinction between the carriageway and pedestrian areas to provide a low-speed access route. The streets would include areas of on-street parking, street furniture and planting to provide informal traffic calming with design speeds of 5 to 10 mph depending on their location within the development.

4.4 SUSTAINABLE TRANSPORT

4.4.1 Primary pedestrian access will be taken from the B4245 adjacent the vehicle access at the southeast corner of the site. The Elms will be upgraded to retain improved pedestrian and cycle connectivity between the site and existing residential areas to the south.

4.4.2 WYG's master plan outlines how the design for the development includes a number of proposals intended to take advantage of and improve the site's accessibility for pedestrians and cyclists, such as pedestrian links and reduced vehicle speeds. The street network will be designed to provide natural traffic calming and a variety of street-edge treatments will be used to create different street characters.

4.4.3 Permeability through the site is provided through supporting and improving existing public rights of way, connecting into the existing residential estates. This will open up the site and improve linkages to create well-connected neighbourhoods that encourage movement on foot and by bicycle. There will be a green corridor through the site providing a local walking/cycling network including connections to the adjacent Vinegar Hill site.

4.4.4 A street hierarchy will be used that carefully balances the needs of cars, pedestrians, and cyclists. Where possible, it will be ensured that within each development area the roads will have a design speed of 20 mph or less, negating the need for designated cycle lanes by providing streets that can be safely shared by pedestrians, cyclists, and cars.

4.4.5 The development will be served by local bus services and the design of highway and pedestrian links will accommodate this.

5 DEVELOPMENT TRAVEL DEMAND

5.1 INTRODUCTION

5.1.1 This section of the TA provides an overview of the associated travel demand resulting from the development of up to 345 dwellings and 5,575m^2 employment use. It considers the expected vehicular traffic generation and impact on the highway.

5.2 TRIP RATES

5.2.1 Trip rates were obtained from the Trip Rate Information Computer System (TRICS) database. The TRICS database was interrogated for sites that would provide a suitable comparison for the development. Detailed information on the TRICS sites chosen is included in Appendix E. These selected sites reflect the type, size, and location of the proposed development.

5.2.2 For the trips associated with the residential dwellings, the search was undertaken for 'privately owned houses' and adhered to the following criteria:

- Sites in Greater London and Ireland were excluded due to the notably different travel patterns observed in these regions compared to the rest of the UK;
- Only weekday surveys were included as the traffic impact assessment is primarily concerned with weekday peak hours;
- Sites including 170 to 520 residential units were chosen due to the size of development being assessed (345 residential units). This resulted in surveys from sites with 174 to 432 units.

5.2.3 This resulted in four residential sites located on the edge of town or edge of town centre. Due to the limited number of surveys available, these were used to generate average trip rates.

5.2.4 The morning and evening peak period traffic flows on the local road network have been identified using the survey data as 07:30 to 08:30 in the AM and 16:30 and 17:30 in the PM. The TRICS database only provides residential trip rates on a per hour basis (i.e. 1600-1700; 1700-1800 etc.). As the identified peak periods are on the half hour, the worst-case trip rates for the whole hour either side of the time period have been used.

5.2.5 The vehicle trip rates per dwelling, generated by the TRICS site, are set out within Table 4.

Table 4: Residential Vehicle Trip Rates

LAND USE	AM (08:00-09:00)		PM (17:00-18:00)	
	ARRIVALS	DEPARTURES	ARRIVALS	DEPARTURES
RESIDENTIAL	0.112	0.384	0.287	0.204

5.2.6 For the trips associated with the employment development, a search was undertaken for use class B1 office. This land use could include research and development of products and processes, light industry appropriate in a residential area[6]. TRICS was interrogated for offices that adhered to the following criteria:

- Sites in Greater London and Ireland were excluded due to the notably different travel patterns observed in these regions compared to the rest of the UK;
- Only weekday surveys were included as the traffic impact assessment is primarily concerned with weekday peak hours;
- Sites including 3,300 to 7,850 sqm were chosen due to the size of development being assessed, which is 5,575 sqm. This resulted in surveys from sites with 3,380 to 6,483 sqm.
- The search excluded sites in the town centre and on the edge of a town centre due to the location of the proposed site. Inclusion of town centre and edge of town centre sites may have resulted in lower vehicle trip rates than would be expected from the location of the development; and
- The population within 5 miles was selected to be within 250,000 given its location to the east of Undy.

5.2.7 This search resulted in four employment sites located in a suburban area or the edge of town. These were used to generate average trip rates for the development.

5.2.8 The TRICS database provides employment trip rates on a half-hourly basis, and therefore the identified peak periods on the local road network of 07:30 to 08:30 in the AM and 16:30 and 17:30 in the PM were used.

5.2.9 The vehicle trip rates per 100 sqm of employment generated by the TRICS sites are set out within Table 5.

Table 5: Employment Vehicle Trip Rates

LAND USE	AM (08:00-09:00)		PM (17:00-18:00)	
	ARRIVALS	DEPARTURES	ARRIVALS	DEPARTURES
OFFICE	1.070	0.125	0.129	1.013

[6] Town and Country Planning (Use Classes) Order 1987

5.3 VEHICLE TRIP GENERATION

5.3.1 Using the Trip Rates obtained from TRICS, it has been possible to calculate the vehicle trips that the development is expected to generate during the morning and evening peak periods.

Table 6: Development Site Vehicle Trip Generation

LAND USE	AM (08:00-09:00)		PM (17:00-18:00)	
	ARRIVALS	DEPARTURES	ARRIVALS	DEPARTURES
RESIDENTIAL	39	132	99	70
OFFICE	60	7	7	56
TOTAL	**99**	**139**	**106**	**126**

5.4 VEHICLE TRIP DISTRIBUTION

5.4.1 Manual Classified Counts were undertaken by Tracsis at seven junctions within the study area. The survey data provided AM and PM peak hour traffic flows. The observed traffic is illustrated in Flow Diagrams 1.1 and 1.2 for the weekday AM peak, and 2.1 and 2.2 for the PM peak period, attached at the rear of this report.

5.4.2 Development traffic has been assigned from the site access using an average of the observed distribution at the B4245 / Rockfield Grove, the B4245 / Dancing Hill, and the B4245 / Pennyfarthing Lane junction surveys. This is considered appropriate given the location of the proposed development. The traffic has then been further distributed across the local highway network using the existing distribution calculated from the survey data, in order to model the key junctions within this assessment.

5.4.3 The AM and PM development distributions are shown in Flow Diagrams 3.1 & 3.2, and 4.1 & 4.2 respectively. The assignment of development traffic is shown in Flow Diagrams 5.1 and 5.2 for the weekday AM peak, and 6.1 and 6.2 for the PM peak period, attached at the rear of this report.

6 TRAFFIC IMPACT ASSESSMENT

6.1 INTRODUCTION

6.1.1 This section of the TA considers the vehicular traffic impact of the proposed development upon the local highway network. The conclusions of this section will quantify the severity of the traffic impact and confirm whether intervention will be required to mitigate the traffic impact.

6.2 ASSESSMENT YEARS

6.2.1 In accordance with DfT Guidance on Transport Assessments, and scoping discussions with MCC, it has been agreed that the following assessment years will be used for traffic impact assessments:

- 2016 - Base situation
- 2018 - Opening Year
- 2026 - Design Year[7]

6.3 TRAFFIC GROWTH

6.3.1 Central traffic growth factors can be calculated using the Trip End Model Presentation Program (TEMPro) version 6.2 growth factors. These have been adjusted with National Road Traffic Forecasts (NRTF) for the study area of 00PP5 Magor. TEMPro used The 2009 National Transport Model (NTM), which includes data from 2003 to 2035, to calculate the growth factors used in this assessment.

6.3.2 The 2018 Opening Year Base Assessment only includes committed development traffic flows. To also include the TEMPro growth factors would be double counting background growth.

6.3.3 The calculated growth factors for the 2026 Design Year are shown in Table 7.

Table 7: TEMPro Growth Factors for Background Traffic

BASE YEAR	DESIGN YEAR	GROWTH FACTORS	
		AM	PM
2016	2026	1.0649	1.0584

[7] 10 years after date of application registration, assumed to be 2016

6.4 COMMITTED DEVELOPMENT

6.4.1 The assessment should take account of traffic arising from local committed or highly likely developments in the study area that would potentially affect the network.

6.4.2 A detailed review of the Local Development Plan and scoping discussions with MCC have been carried out to determine the validity of any sites within the local area. It was agreed with MCC that the assessment should include the following allocations:

- → 'Sudbrook Paper Mill' – development for 190 dwellings
- → 'Crick Road' – development in Caldicot for 285 dwellings and 5,575 m^2 B1 employment

6.4.3 The 'Vinegar Hill' allocation for 225 dwellings to the west of the Rockfield Farm development has been assessed as a separate sensitivity test. This is discussed in 6.5 below.

SUDBROOK PAPER MILL

6.4.4 The estimated vehicle trip generation of the 'Sudbrook Paper Mill' committed development has been taken from the 2012 Transport Assessment prepared by Vectos on behalf of Harrow Estates. This assessment considered the implication of 350 dwellings on the site, and provided the total forecast vehicle trips of 210 in the AM and 228 in the PM.

6.4.5 MCC have agreed that for the purpose of this assessment, the allocation included in the LDP on this site for 190 dwellings should be used. The vehicle trips included in the 2012 TA have therefore been factored down. A summary of this is shown in Table 8.

Table 8: 'Sudbrook Paper Mill' Vehicle Trips – 350 and 190 Dwellings

	AM IN	AM OUT	AM TOTAL	PM IN	PM OUT	PM TOTAL
350 dwellings	56	154	210	144	84	228
190 dwellings	30	84	114	78	46	124

6.4.6 Figures 16 and 17 in the 2012 TA distribute the trips through the local highway network in the AM and PM peaks respectively, including the B4245 / Chepstow Road junction. The proportion of traffic using this junction travelling towards or from Undy is shown in Table 9.

Table 9: 'Sudbrook Paper Mill' Vehicle Proportions using B4245 / Chepstow Road junction

	AM IN	AM OUT	PM IN	PM OUT
B4245 Beyond Chepstow Road	32%	37%	30%	35%

6.4.7 The Sudbrook TA does not consider beyond this junction, which is 5.5km from the Rockfield Farm development site. It has been assumed that all of the traffic from the Sudbrook development to and from the B4245 / Chepstow Road junction arrives at and departs from the B4245 south of the Rockfield development site. These vehicle trips are shown in Table 10.

Table 10: 'Sudbrook Paper Mill' Vehicle Trips used in Rockfield Assessment

AM IN	AM OUT	AM TOTAL	PM IN	PM OUT	PM TOTAL
10	31	41	23	16	39

6.4.8 The trips identified in Table 10 have been assigned to the local highway network in our study area using the same assignment as used for the Rockfield development traffic, as described in section 5.4 above.

CRICK ROAD

6.4.9 The estimated vehicle trip generation of the 'Crick Road' committed development has been taken from the 2010 Transport Assessment prepared by Capita Symonds on behalf of MCC. This assessment considered the implication of 240 dwellings on the site, and provided the total forecast vehicle trips as shown in Table 11.

Table 11: 'Crick Road' Vehicle Trips – 240 Dwellings

	AM IN	AM OUT	AM TOTAL	PM IN	PM OUT	PM TOTAL
240 dwellings	58	118	176	119	85	204

6.4.10 It has been agreed with MCC that 285 dwellings (as per the LDP allocation for this site) be used in this assessment. The residential vehicle trips included in the 2010 TA have therefore been factored up. The LDP allocation for the land at Crick Road also includes 5,575 m^2 of B1 employment. The 2010 TA did not assess this, and therefore the trip rates for the B1 employment use on the Rockfield site have been used as a proxy. The resulting residential and employment vehicle trips are shown in Table 12.

Table 12: 'Crick Road' Total Vehicle Trips

	AM IN	AM OUT	AM TOTAL	PM IN	PM OUT	PM TOTAL
285 dwellings	69	140	209	141	101	242
B1 Office	60	7	67	7	56	63
Total	**129**	**147**	**276**	**149**	**157**	**306**

6.4.11 Figures 4.8 and 4.13 of the Crick Road TA distribute the vehicle trips through the B4245 / Caldicot Road roundabout junction in the AM and PM peaks respectively. The proportion of traffic using this junction travelling towards or from Caldicot is shown in Table 13.

Table 13: 'Crick Road' Vehicle Proportions using B4245 / Caldicot Road junction

	AM IN	AM OUT	PM IN	PM OUT
B4245 beyond Caldicot Road	57%	47%	71%	60%

6.4.12 As the Crick Road TA does not consider beyond this junction, the distribution through the B4245 / Chepstow Road junction established in the Sudbrook TA has been applied to the vehicle flows. The proportion of traffic using this junction travelling towards or from Undy is shown in Table 14.

Table 14: 'Crick Road' Vehicle Proportions using B4245 / Chepstow Road junction

	AM IN	AM OUT	PM IN	PM OUT
B4245 beyond Chepstow Road	34%	30%	37.5%	32%

6.4.13 It has been assumed that all of the traffic from the Crick Road development to and from the B4245 / Chepstow Road junction arrives at and departs from the B4245 south of the Rockfield development site. The vehicle trips shown in Table 15 have been assigned to the local highway network through Magor and Undy using the same assignment as used for the Rockfield development traffic, as described in section 5.4 above.

Table 15: 'Crick Road' Vehicle Trips used in Rockfield Assessment

AM IN	AM OUT	AM TOTAL	PM IN	PM OUT	PM TOTAL
44	44	88	56	50	106

6.5 VINEGAR HILL SENSITIVITY TEST

6.5.1 Through the LDP process, the Rockfield Farm development site was identified with the ability to provide a link from its access on the B4245 to the adjoining 'Vinegar Hill' strategic site. The proposals within this assessment include integration between the two developments and surrounding existing communities and transport network.

6.5.2 The Highway Authority's (HA) feedback on the LDP identified that any application for development of Rockfield Farm or Vinegar Hill should include a Transport Assessment that considered both strategic sites. The HA wish to consider the impact of both developments to identify whether any further off-site highway improvements are necessary. In addition, the sites should be considered in parallel in order to deliver a suitable scheme that provides suitable links to both developments and the wider area.

6.5.3 The Vinegar Hill allocation for 225 dwellings has therefore been assessed as a sensitivity test in respect of access requirements and local highway network performance.

6.5.4 The estimated vehicle trip generation of the Vinegar Hill committed development has been taken from the 2012 Transport Assessment prepared by FMW Consultancy on behalf of Bovis Homes. This assessment considered the implication of three development options, including the maximum of 250 dwellings. The total forecast vehicle trips identified in the Vinegar Hill TA for this option are shown in Table 16.

Table 16: 'Vinegar Hill' Vehicle Trips – 250 Dwellings

	AM IN	AM OUT	AM TOTAL	PM IN	PM OUT	PM TOTAL
250 dwellings	61	123	184	124	89	213

6.5.5 It has been agreed with MCC that for the purpose of this assessment, the allocation included in the LDP on this site for 225 dwellings be used. The vehicle trips included in the Vinegar Hill TA (2012) have therefore been factored down and are shown in Table 17.

Table 17: 'Vinegar Hill' Vehicle Trips – 225 Dwellings

	AM IN	AM OUT	AM TOTAL	PM IN	PM OUT	PM TOTAL
225 dwellings	55	111	166	112	80	192

6.5.6 Figure D1 in the Vinegar Hill TA distributes these trips from the same site access as the Rockfield Farm development onto the B4245. This established distribution has been used in the sensitivity testing included in this assessment.

6.6 M4 CORRIDOR AROUND NEWPORT

OVERVIEW

6.6.1 As discussed in the Policy Review, the Welsh Government announced the Plan for the M4 Corridor around Newport (CaN) in 2014. This TA presents an assessment of the impact of the CaN, based on the Welsh Government's 2014 modified Preferred Route (TR111). This scheme comprises the construction of a new section of 3-lane motorway between Junctions 23 and 29 (Magor to Castleton), including a new crossing of the River Usk south of Newport. The route corridor of this option is shown in Figure 10.

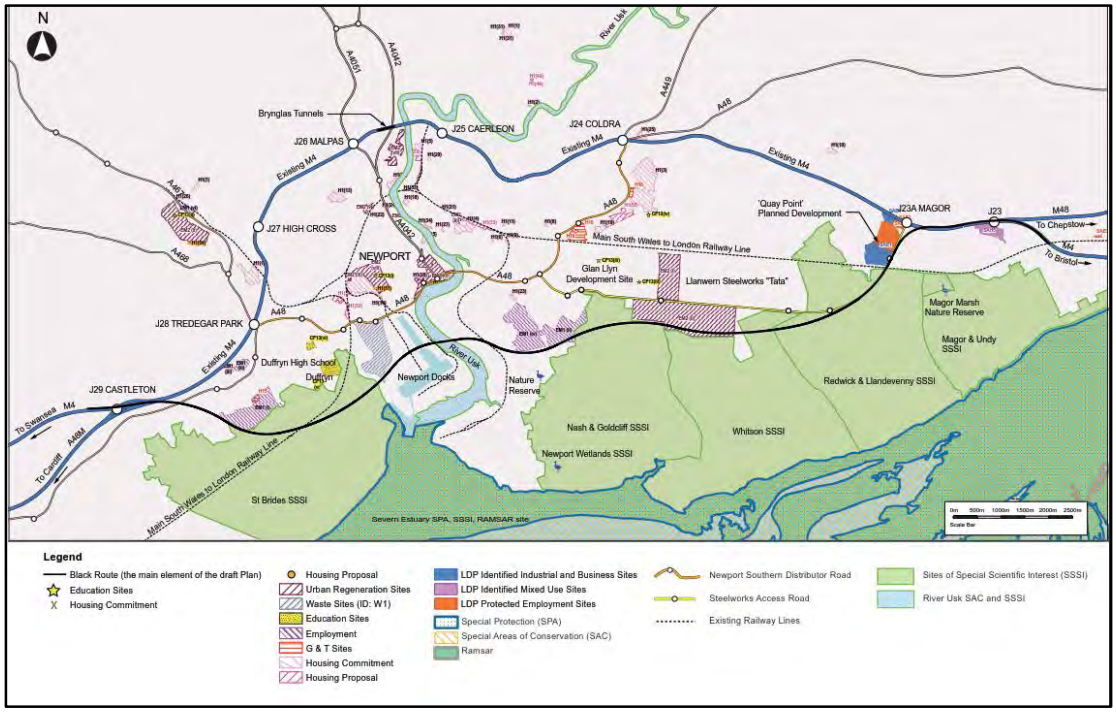


Figure 10: The Proposed Line of a New Section of Motorway to the South of Newport

6.6.2 The TR111 route to the south of Newport has remained protected for planning purposes since April 2006. The alignment of this proposed new section of motorway has been developed following extensive consultation, investigation, and analysis. The Preferred Route Context Plan is included in Appendix A of this report.

IMPACT ON DEVELOPMENT

6.6.3 The existing M4 corridor around Magor has a merge/diverge at Junction 23 east of Undy. This does not provide access to the M4 or M48 from Magor/Undy. The M4 can currently be accessed at Junction 23A west of Magor. This requires vehicles to travel west through Magor via the B4245. It also results in traffic from Rogiet, Caldicot, and other villages in the east travelling through Magor/Undy to access the M4 at J23A to proceed both west and east.

6.6.4 The CaN route includes the provision of a connection between the M4, M48, and the B4245, improving access to the Severn Tunnel Park and Ride Station and reducing traffic travelling through Magor and Undy. The proposed new arrangement of the new M4 and M48 around Magor is shown in Figure 11 overleaf.

6.6.5 The proposed arrangement of the M4 and M48 motorways and the associated junctions is likely to improve access to the M4 corridor from the development site. Figure 11 overleaf demonstrates the proposed layout of Junction 23 to the east of Magor. This will provide links between the development site and the M4 and M48 eastbound and westbound via the B4245. A slip road from the M4 allows westbound vehicles travelling to the site to enter the B4245 via a priority junction. All other trips travelling to the site from the M4 and M48 will be required to use the new roundabouts north of the M4 to reach the B4245.

6.6.6 One of the complementary measures included within the scheme involves reclassification of the existing motorway between Magor and Castleton. Therefore, the existing M4 between Junctions 23 and 29 will be reclassified as a trunk road. The existing junction to the west of Magor (J23A) is planned to provide direct links between Magor and the M48 in both directions. Vehicles will no longer be able to access the M4 directly at this junction. Alternative access to the M4 west of Magor would be gained via Glan Llyn Junction from the A4810.

6.6.7 The impact of the M4 CaN has been included within this TA as an indicative sensitivity test in the Design Year with the Rockfield Farm and all committed developments. To inform this TA, traffic flows have been extracted from the Welsh Government's 2012 Traffic Forecasting Report (TFR) ('New M4 Project, Magor to Castleton', prepared by Arup).

6.6.8 The Central Growth Forecast traffic flows for the existing M4 east and west of Junction 23A in years 2020 and 2035 in the Do-Minimum and With New M4 scenarios have been extracted from the TFR. From these flows, estimates for the 2026 assessment year have been calculated. The difference in flows have been used to estimate the reduced number of vehicles using Junction 23A when the scheme has been implemented.

6.6.9 Assumptions have been applied to the vehicles using the B4245. For instance, as the M4 scheme will improve access to the Severn Tunnel Park and Ride Station and villages to the east of Undy, it will reduce traffic travelling through Magor and Undy.

6.6.10 As well as the reduction in through-trips, assumptions have been made about the trips originating and destined for the Undy / Magor area. This high-level method re-distributed vehicles originating from the Undy / Magor area that currently head west towards Junction 23A, deduced from the reduced number of vehicles calculated to be using Junction 23A (see 6.6.8 above). These trips have been amended to head in the opposite direction towards the new junction in the east. The same assumptions have been applied in reverse for vehicles that are destined for the Undy / Magor area from the new M4 junction.

6.6.11 As part of the M4 scheme, the existing B4245/ East Facing Steelworks Road Slips roundabout and the existing B4245/ West Facing Steelworks Road Slips signalised junction will be improved into one roundabout junction. This TA does not include an assessment of this improved junction.

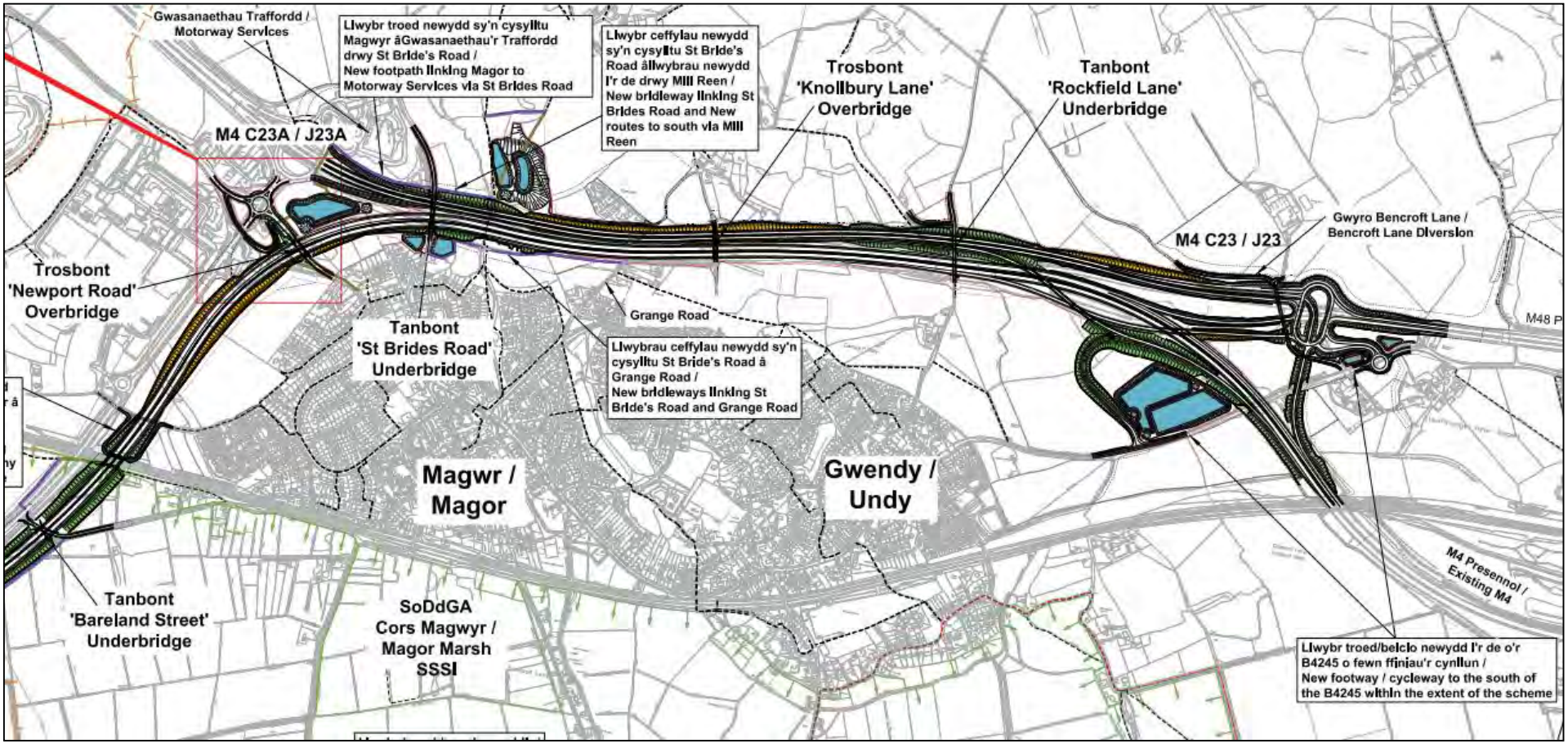


Figure 11: Proposed Arrangement of M4 CaN and M48 around Magor

6.7 SCENARIOS TO BE TESTED

6.7.1 The traffic impact assessment will be tested in the scenarios set out in Table 18. The Flow Diagrams associated with each scenario is included at the rear of this report.

Table 18: Scenarios to Be Tested

SCENARIO	DESCRIPTION	FLOW DIAGRAMS	
		AM	PM
2016 BASE YEAR	**This is the year that the surveys were undertaken, and represents the base year conditions and the junctions as they currently operate.**	1.1 and 1.2	2.1 and 2.2
2018 OPENING YEAR BASE	**2018 is the anticipated Opening Year of the development. This scenario represents the network as it will operate in 2018, with background traffic growth from committed developments. MCC have specified that Crick Road and Sudbrook Paper Mill should be included in this scenario.**	7.1 and 7.2	8.1 and 8.2
2018 OPENING YEAR BASE + ROCKFIELD DEVELOPMENT	**This scenario represents the network in 2018 (specified above), plus the Rockfield Farm development. The full development will be tested for robustness.**	9.1 and 9.2	10.1 and 10.2
2018 OPENING YEAR BASE + ROCKFIELD AND VINEGAR HILL DEVELOPMENTS (SENSITIVITY TEST 1)	**MCC have requested that a separate sensitivity test be undertaken to understand the impact that the Vinegar Hill site will have in respect of access requirements and local highway network performance. This scenario represents the Base + Development network in 2018 (specified above), plus the Vinegar Hill development flows.**	11.1 and 11.2	12.1 and 12.2
2026 DESIGN YEAR BASE	**This scenario represents the network as it will operate in 2026, based on national traffic growth and the Crick Road and Sudbrook Mill committed developments.**	13.1 and 13.2	14.1 and 14.2
2026 DESIGN YEAR BASE + ROCKFIELD DEVELOPMENT	**This scenario represents the network in 2026 (specified above), plus the full Rockfield Farm development.**	15.1 and 15.2	16.1 and 16.2
2026 DESIGN YEAR BASE + ROCKFIELD AND VINEGAR HILL DEVELOPMENTS (SENSITIVITY TEST 1)	**This scenario represents the Base + Development network in 2026 (specified above), plus the Vinegar Hill development flows as a sensitivity test of its impact in respect of access requirements and local highway network performance.**	17.1 and 17.2	18.1 and 18.2
2026 DESIGN YEAR BASE + ROCKFIELD AND VINEGAR HILL DEVELOPMENTS + M4 IMPROVEMENTS (SENSITIVITY TEST 2)	**This scenario represents the Base network in 2026 with the full Vinegar Hill + Rockfield Farm developments (specified above), with the M4 Corridor Around Newport.**	19.1 and 19.2	20.1 and 20.2

6.8 JUNCTION CAPACITY ASSESSMENT

6.8.1 As agreed with MCC, six junctions have been assessed to determine the traffic impact associated with the proposed development. These junctions are as follows:

- B4245/ Rockfield Farm access (priority junction)
- B4245/ Rockfield Farm access (roundabout[8])
- B4245/ Rockfield Grove (priority junction)
- B4245/ Dancing Hill (priority junction)
- B4245/ East Facing Steelworks Road Slips (roundabout)
- B4245/ West Facing Steelworks Road Slips (signalised junction)

6.8.2 To assess the operational performance of priority and roundabout junctions, the Transport Research Laboratories (TRL) junction capacity assessment program 'Junctions 8' was utilised. The priority junctions were modelled using the PICADY package of Junctions, while the roundabouts were modelled using ARCADY.

6.8.3 To assess the operational performance of the B4245/ West Facing Steelworks Road Slips signalised junction, the JCT modelling software 'LinSig' was used.

6.8.4 The junction modelling output files are presented in Appendix F.

6.9 TRAFFIC MODELLING RESULTS

6.9.1 This section presents the model output for each junction. The modelling results within this assessment outline the impact of the proposed development traffic on the key junctions in the network based on the scenarios outlined in Table 18.

6.9.2 The Ratio of Flow to Capacity (RFC) is a ratio of the demand to capacity on each approach to the junctions, with a value of 100% (1.0) signifying that the capacity of the road has been reached, thus resulting in vehicle queues. The RFC provides a basis for judging the acceptability of junction designs and typically an RFC of less than 0.85 is considered to indicate satisfactory performance. Welsh Office (TA23/81) guidance indicates that when an entry RFC is below 0.85, queuing will theoretically be avoided for junctions where the speed limit is 50 mph or less.

6.9.3 The results for the junction modelled in LinSig include the Degree of Saturation (DOS), which is defined as the ratio of Flow to Capacity for the assessed lane. As with the RFC, results of less than 85% are regarded as operating at an acceptable level.

6.9.4 The assessed junctions have been modelled in the weekday AM and PM network peak hours, determined from the observed traffic flows as 0730 – 0830 and 1630 – 1730 respectively.

[8] To inform design options, a roundabout was tested in addition to the proposed priority junction.

SITE ACCESS – PRIORITY JUNCTION

6.9.5 The master plan (WYG, 2016) has outlined that primary vehicular and pedestrian access will be taken from the B4245 at the south-east corner of the site via a priority T-junction. A design for this has been prepared by WSP | PB and is attached in Appendix H.

6.9.6 MCC have requested that a separate sensitivity test be undertaken to understand the impact that the Vinegar Hill site will have in respect of access requirements and local highway network performance. This assessment therefore includes a separate sensitivity test with traffic from the Vinegar Hill development as well as traffic from the Rockfield Farm development using the site access. A second sensitivity test considers the junction with the M4 improvements.

6.9.7 As this junction is part of the development proposals, no assessment has been undertaken for the Base Year or for the Base scenarios in the Opening and Design Years. The results for the future year scenarios including the Sensitivity Tests for the junction are shown in Table 19.

Table 19: Summary of B4245 / Site Access PICADY Assessment

B4245 / SITE ACCESS PRIORITY JUNCTION	AM (07:30 – 08:30)			PM (16:30 – 17:30)		
	Queue (Veh)	Delay (Secs)	RFC	Queue (Veh)	Delay (Secs)	RFC
2018 OPENING YEAR BASE + ROCKFIELD DEVELOPMENT						
Site Access Road	0.58	22.34	0.37	0.37	22.77	0.27
B4245	0.13	8.01	0.11	0.13	8.72	0.12
2018 OPENING YEAR BASE + ROCKFIELD AND VINEGAR HILL DEVELOPMENTS (SENSITIVITY TEST 1)						
Site Access Road	2.61	58.24	0.75	1.14	41.65	0.54
B4245	0.23	8.84	0.19	0.30	10.43	0.23
2026 DESIGN YEAR BASE + ROCKFIELD DEVELOPMENT						
Site Access Road	0.64	24.68	0.39	0.40	24.94	0.29
B4245	0.13	8.19	0.12	0.14	8.93	0.12
2026 DESIGN YEAR BASE + ROCKFIELD AND VINEGAR HILL DEVELOPMENTS (SENSITIVITY TEST 1)						
Site Access Road	3.38	76.47	0.80	1.35	49.95	0.59
B4245	0.23	9.05	0.19	0.31	10.74	0.24
2026 DESIGN YEAR BASE + ROCKFIELD AND VINEGAR HILL DEVELOPMENTS + M4 IMPROVEMENTS (SENSITIVITY TEST 2)						
Site Access Road	1.10	32.96	0.53	0.40	17.59	0.29
B4245	0.23	8.96	0.19	0.14	7.75	0.12

6.9.8 The results show that the priority access junction would operate within capacity in all scenarios. Sensitivity Test 1 shows a notable increase in queues, delay, and RFC with the additional traffic from the Vinegar Hill development. For instance, in the Design Year the RFC increases from 0.39 to 0.80 in the AM peak on the site access road.

6.9.9 With the M4 improvements and the construction of a motorway junction to the east of the development, a higher number of vehicles turn left from the site access road. This reduces the queues and delays from this arm.

SITE ACCESS – ROUNDABOUT JUNCTION

6.9.10 To inform the design options, a roundabout was tested in addition to the proposed priority junction. For this assessment, ARCADY was used to assess a 3-arm roundabout at the site access, using the design presented in the 2010 Capita Symonds TA.

6.9.11 The results for the future year scenarios including the Sensitivity Tests for the site access junction are shown in Table 20.

Table 20: Summary of B4245 / Site Access ARCADY Assessment

B4245 / SITE ACCESS ROUNDABOUT JUNCTION	AM (07:30 – 08:30)			PM (16:30 – 17:30)		
	Queue (Veh)	Delay (Secs)	RFC	Queue (Veh)	Delay (Secs)	RFC
2018 OPENING YEAR BASE + ROCKFIELD DEVELOPMENT						
B4245 (east)	1.11	5.51	0.53	0.90	4.84	0.47
B4245 (west)	0.88	4.82	0.47	1.33	6.01	0.57
Site Access	0.18	4.08	0.15	0.17	4.38	0.15
2018 OPENING YEAR BASE + ROCKFIELD AND VINEGAR HILL DEVELOPMENTS (SENSITIVITY TEST 1)						
B4245 (east)	1.32	6.28	0.57	1.07	5.37	0.52
B4245 (west)	0.98	5.13	0.50	1.73	7.21	0.64
Site Access	0.37	4.73	0.27	0.31	4.91	0.24
2026 DESIGN YEAR BASE + ROCKFIELD DEVELOPMENT						
B4245 (east)	1.23	5.85	0.55	0.98	5.06	0.50
B4245 (west)	0.98	5.06	0.50	1.48	6.40	0.60
Site Access	0.19	4.18	0.16	0.18	4.50	0.15
2026 DESIGN YEAR BASE + ROCKFIELD AND VINEGAR HILL DEVELOPMENTS (SENSITIVITY TEST 1)						
B4245 (east)	1.48	6.72	0.60	1.17	5.64	0.54
B4245 (west)	1.08	5.41	0.52	1.95	7.80	0.66
Site Access	0.38	4.87	0.28	0.32	5.06	0.25
2026 DESIGN YEAR BASE + ROCKFIELD AND VINEGAR HILL DEVELOPMENTS + M4 IMPROVEMENTS (SENSITIVITY TEST 2)						
B4245 (east)	0.78	4.71	0.44	0.72	4.43	0.42
B4245 (west)	1.05	5.32	0.51	0.69	4.37	0.41
Site Access	0.37	4.82	0.27	0.25	3.86	0.20

6.9.12 The results show that a 3-arm roundabout access junction would operate within capacity in all scenarios. Sensitivity Test 1 shows that there is an increase in queues, delay, and RFC on all arms with the additional traffic from the Vinegar Hill development. There is a reduction in delays and queues with the M4 improvements and the construction of a motorway junction to the east of the development.

B4245 / ROCKFIELD GROVE

6.9.13 The B4245 / Rockfield Grove Junction is a priority T-junction, where Rockfield Grove is the minor arm. It has been modelled using PICADY, and a summary of the highest Base Year results are shown in Table 21. These results represent how the junction currently operates, which is well within capacity, with minimal delays.

Table 21: Summary of B4245 / Rockfield Grove Base Year PICADY Assessment

B4245 / ROCKFIELD GROVE JUNCTION	AM (07:30 – 08:30)			PM (16:30 – 17:30)		
	Queue (Veh)	Delay (Secs)	RFC	Queue (Veh)	Delay (Secs)	RFC
2016 BASE YEAR						
Rockfield Grove	0.13	12.11	0.12	0.05	12.77	0.05
B4245 (east)	0.02	6.57	0.02	0.07	6.69	0.07

6.9.14 The assessments have been validated by comparing queue length surveys carried out on the same day as the observed traffic surveys, with the Queue (Veh) from the capacity assessments. The Queue Length surveys undertaken in March 2016 define a queue as those vehicles at a junction which are stationary or which have slowed down to walking speed or less. The surveys show that the average maximum number of vehicles in the AM and PM peaks queuing at Rockfield Grove is 1. It is considered that the PICADY model is representative of junction performance.

6.9.15 Table 22 below provides a summary of the modelling results for the 2018 Opening Year at the A4245/Rockfield Grove junction.

Table 22: Summary of B4245 / Rockfield Grove Opening Year PICADY Assessment

B4245 / ROCKFIELD GROVE JUNCTION	AM (07:30 – 08:30)			PM (16:30 – 17:30)		
	Queue (Veh)	Delay (Secs)	RFC	Queue (Veh)	Delay (Secs)	RFC
2018 OPENING YEAR BASE						
Rockfield Grove	0.15	13.34	0.13	0.06	14.30	0.06
B4245 (east)	0.02	6.73	0.02	0.08	7.04	0.08
2018 OPENING YEAR BASE + ROCKFIELD DEVELOPMENT						
Rockfield Grove	0.16	14.97	0.14	0.07	15.88	0.06
B4245 (east)	0.03	6.92	0.03	0.10	7.37	0.09
2018 OPENING YEAR BASE + ROCKFIELD AND VINEGAR HILL DEVELOPMENTS (SENSITIVITY TEST 1)						
Rockfield Grove	0.18	16.18	0.15	0.07	17.71	0.07
B4245 (east)	0.03	7.01	0.03	0.10	7.71	0.09

6.9.16 The results show that the B4245 / Rockfield Grove priority junction operates well within capacity in all opening year scenarios, and that the Rockfield development does not adversely affect this junction. Sensitivity Test 1 shows that there is a negligible increase in queues and delay with the additional traffic from the Vinegar Hill development.

6.9.17 Table 23 below provides a summary of the modelling results for the 2026 Design Year at the A4245/Rockfield Grove junction.

Table 23: Summary of B4245 / Rockfield Grove Design Year PICADY Assessment

B4245 / ROCKFIELD GROVE JUNCTION	AM (07:30 – 08:30)			PM (16:30 – 17:30)		
	Queue (Veh)	Delay (Secs)	RFC	Queue (Veh)	Delay (Secs)	RFC
2026 DESIGN YEAR BASE						
Rockfield Grove	0.16	14.20	0.14	0.06	15.15	0.06
B4245 (east)	0.03	6.86	0.02	0.09	7.23	0.08
2026 DESIGN YEAR BASE + ROCKFIELD DEVELOPMENT						
Rockfield Grove	0.18	16.04	0.16	0.07	16.92	0.07
B4245 (east)	0.03	7.05	0.03	0.10	7.57	0.09
2026 DESIGN YEAR BASE + ROCKFIELD AND VINEGAR HILL DEVELOPMENTS (SENSITIVITY TEST 1)						
Rockfield Grove	0.20	17.42	0.17	0.08	19.01	0.07
B4245 (east)	0.03	7.14	0.03	0.11	7.92	0.10
2026 DESIGN YEAR BASE + ROCKFIELD AND VINEGAR HILL DEVELOPMENTS + M4 IMPROVEMENTS (SENSITIVITY TEST 2)						
Rockfield Grove	0.16	14.44	0.14	0.06	12.52	0.06
B4245 (east)	0.03	7.08	0.03	0.09	6.55	0.08

6.9.18 The results show the B4245 / Rockfield Grove priority junction operating well within capacity, with a negligible increase in RFCs with the additional traffic from the developments. The M4 improvements reduce the queues and delays on Rockfield Grove, due to fewer vehicles turning right from this minor arm needing to cross two lanes of traffic on the major arm.

B4245 / DANCING HILL

6.9.19 The B4245 / Dancing Hill Junction is a priority T-junction, where Dancing Hill is the minor arm. It has been modelled using PICADY, and a summary of the highest Base Year results are shown in Table 21. These results represent how the junction currently operates, which is well within capacity, with minimal delays.

Table 24: Summary of B4245 / Dancing Hill Base Year PICADY Assessment

B4245 / DANCING HILL JUNCTION	AM (07:30 – 08:30)			PM (16:30 – 17:30)		
	Queue (Veh)	Delay (Secs)	RFC	Queue (Veh)	Delay (Secs)	RFC
2016 BASE YEAR						
Dancing Hill	1.07	25.45	0.52	0.32	19.92	0.25
B4245 (east)	0.05	6.04	0.05	0.21	8.46	0.18

6.9.20 The model has been compared with the queue length surveys, and it is considered that the PICADY model is representative of junction performance.

6.9.21 Table 25 provides a summary of the modelling results for the 2018 Opening Year at the A4245/Dancing Hill junction. The results show that the junction operates within capacity in all opening year scenarios. There are small increases in queues and delay in both peak hours with the additional traffic from the Rockfield Farm and Vinegar Hill developments.

Table 25: Summary of B4245 / Dancing Hill Opening Year PICADY Assessment

B4245 / DANCING HILL JUNCTION	AM (07:30 – 08:30)			PM (16:30 – 17:30)		
	Queue (Veh)	Delay (Secs)	RFC	Queue (Veh)	Delay (Secs)	RFC
2018 OPENING YEAR BASE						
Dancing Hill	1.24	29.70	0.56	0.38	23.43	0.28
B4245 (east)	0.06	6.10	0.05	0.25	9.04	0.20
2018 OPENING YEAR BASE + ROCKFIELD DEVELOPMENT						
Dancing Hill	1.51	36.48	0.61	0.45	27.59	0.31
B4245 (east)	0.06	6.26	0.06	0.29	9.59	0.22
2018 OPENING YEAR BASE + ROCKFIELD AND VINEGAR HILL DEVELOPMENTS (SENSITIVITY TEST 1)						
Dancing Hill	1.83	44.50	0.66	0.55	34.23	0.36
B4245 (east)	0.06	6.34	0.06	0.31	10.18	0.23

6.9.22 Table 26 below provides a summary of the modelling results for the 2026 Design Year at the A4245/Rockfield Grove junction.

Table 26: Summary of B4245 / Dancing Hill Design Year PICADY Assessment

B4245 / DANCING HILL JUNCTION	AM (07:30 – 08:30)			PM (16:30 – 17:30)		
	Queue (Veh)	Delay (Secs)	RFC	Queue (Veh)	Delay (Secs)	RFC
2026 DESIGN YEAR BASE						
Dancing Hill	1.65	37.51	0.64	0.47	27.44	0.32
B4245 (east)	0.06	6.23	0.06	0.28	9.56	0.22
2026 DESIGN YEAR BASE + ROCKFIELD DEVELOPMENT						
Dancing Hill	2.15	49.54	0.70	0.57	33.31	0.37
B4245 (east)	0.07	6.39	0.06	0.32	10.17	0.24
2026 DESIGN YEAR BASE + ROCKFIELD AND VINEGAR HILL DEVELOPMENTS (SENSITIVITY TEST 1)						
Dancing Hill	2.77	64.79	0.76	0.73	43.45	0.43
B4245 (east)	0.07	6.47	0.06	0.35	10.83	0.26
2026 DESIGN YEAR BASE + ROCKFIELD AND VINEGAR HILL DEVELOPMENTS + M4 IMPROVEMENTS (SENSITIVITY TEST 2)						
Dancing Hill	0.50	17.55	0.34	0.26	19.73	0.21
B4245 (east)	0.08	6.07	0.08	0.42	9.03	0.29

6.9.23 The results show that the B4245 / Dancing Hill priority junction operates within capacity in the Design Year, with an increase in queues, delays, and RFCs with the additional traffic from the developments. The M4 improvements significantly reduce the queues and delays on Dancing Hill, especially in the AM peak. This can be attributed to the reduction in vehicles travelling along the B4245, providing vehicles more opportunities to exit from the minor arm.

B4245/ EAST FACING STEELWORKS ROAD SLIPS (ROUNDABOUT)

6.9.24 The B4245 / East Facing Steelworks Road Slips is a four-arm roundabout to the west of the development site, which provides access to the M4. It has been modelled using a calibrated ARCADY model with Intercept Adjustments made to address the imbalance of flows observed on the entry arms. A summary of the Base Year results are shown in Table 27.

Table 27: Summary of B4245 / East Facing Steelworks Road Base Year ARCADY Assessment

B4245 / EAST FACING STEELWORKS ROUNDABOUT	AM (07:30 – 08:30)			PM (16:30 – 17:30)		
	Queue (Veh)	Delay (Secs)	RFC	Queue (Veh)	Delay (Secs)	RFC
2016 BASE YEAR						
B4245 (east)	1.79	6.06	0.64	0.43	2.97	0.30
Magor Road	0.83	7.70	0.46	2.38	11.66	0.71
B4245 (west)	0.23	4.28	0.19	1.81	14.97	0.65
Unknown Road	0.00	0.00	0.00	0.00	0.00	0.00

6.9.25 The model has been validated against the queue length surveys, which indicated that in the AM peak, queues occur sporadically along the eastern arm of the B4245, and queues were observed regularly throughout the hour on Magor Road. In the PM peak, the surveys showed that queues occur frequently on Magor Road, with some queues observed on the western arm of the B4245.

6.9.26 It is considered that the results from the calibrated Base Year model are representative of junction performance.

6.9.27 These results show that the junction currently operates within capacity, with some delays on Magor Road in the AM peak and on Magor Road and the western arm of the B4245 in the PM peak.

6.9.28 Table 28 provides a summary of the modelling results for the 2018 Opening Year at the roundabout.

Table 28: Summary of B4245 / East Facing Steelworks Road Opening Year ARCADY Assessment

B4245 / EAST FACING STEELWORKS ROUNDABOUT	AM (07:30 – 08:30)			PM (16:30 – 17:30)		
	Queue (Veh)	Delay (Secs)	RFC	Queue (Veh)	Delay (Secs)	RFC
2018 OPENING YEAR BASE						
B4245 (east)	2.15	6.83	0.68	0.48	3.07	0.33
Magor Road	1.04	9.15	0.51	3.16	14.85	0.77
B4245 (west)	0.25	4.49	0.20	2.38	18.84	0.71
Unknown Road	0.00	0.00	0.00	0.00	0.00	0.00
2018 OPENING YEAR BASE + ROCKFIELD DEVELOPMENT						
B4245 (east)	2.59	7.75	0.72	0.53	3.17	0.35
Magor Road	1.33	11.14	0.58	4.15	19.06	0.81
B4245 (west)	0.28	4.71	0.22	3.10	23.70	0.77
Unknown Road	0.00	0.00	0.00	0.00	0.00	0.00
2018 OPENING YEAR BASE + ROCKFIELD AND VINEGAR HILL DEVELOPMENTS (SENSITIVITY TEST 1)						
B4245 (east)	3.38	9.56	0.78	0.60	3.36	0.38
Magor Road	1.72	14.01	0.64	7.22	32.03	0.89
B4245 (west)	0.30	4.86	0.23	4.78	35.53	0.84
Unknown Road	0.00	0.00	0.00	0.00	0.00	0.00

6.9.29 The results show that in the AM peak, the junction operates within capacity in all Opening Year scenarios. There are small increases in queues and delay on all arms of the roundabout with the additional traffic from the Rockfield Farm and Vinegar Hill developments.

6.9.30 In the PM peak, the largest flow of traffic is from Magor Road to B4245 (east). In the base and the base + Rockfield Development scenarios, the junction operates within capacity. In the Sensitivity Test with traffic from the Vinegar Hill development, the RFC value on Magor Road is 0.89 in the PM peak. As explained in 6.9.2, an RFC of less than 0.85 is considered to indicate satisfactory performance. RFC values over 0.85 are considered to be approaching capacity, with queues beginning to form.

6.9.32 Table 29 provides a summary of the results for the 2026 Design Year at the roundabout.

Table 29: Summary of B4245 / East Facing Steelworks Road Design Year ARCADY Assessment

B4245 / EAST FACING STEELWORKS ROUNDABOUT	AM (07:30 – 08:30)			PM (16:30 – 17:30)		
	Queue (Veh)	Delay (Secs)	RFC	Queue (Veh)	Delay (Secs)	RFC
2026 DESIGN YEAR BASE						
B4245 (east)	2.62	7.89	0.73	0.52	3.15	0.34
Magor Road	1.29	10.71	0.57	4.29	19.36	0.82
B4245 (west)	0.28	4.63	0.22	3.29	24.97	0.78
Unknown Road	0.00	0.00	0.00	0.00	0.00	0.00
2026 DESIGN YEAR BASE + ROCKFIELD DEVELOPMENT						
B4245 (east)	3.22	9.17	0.77	0.57	3.26	0.37
Magor Road	1.70	13.52	0.64	6.03	26.71	0.87
B4245 (west)	0.31	4.87	0.24	4.55	33.64	0.84
Unknown Road	0.00	0.00	0.00	0.00	0.00	0.00
2026 DESIGN YEAR BASE + ROCKFIELD AND VINEGAR HILL DEVELOPMENTS (SENSITIVITY TEST 1)						
B4245 (east)	4.35	11.77	0.82	0.65	3.45	0.39
Magor Road	2.30	17.86	0.70	12.45	52.45	0.95
B4245 (west)	0.33	5.03	0.25	7.79	55.38	0.92
Unknown Road	0.00	0.00	0.00	0.00	0.00	0.00

6.9.33 The results show that in the AM peak, the junction operates within capacity in all Design Year scenarios. There are small increases in queues and delay on all arms of the roundabout with the additional traffic from the Rockfield Farm and Vinegar Hill developments.

6.9.34 In the PM peak, the junction is operating within capacity in the base scenario, with an RFC of 0.82 on Magor Road, and queues and delays forming on Magor Road and the western arm of the B4245. With the addition of the traffic from the Rockfield Farm development, the junction continues to operate within capacity, although it is beyond the generally accepted level of 0.85. The queues increase by approximately two vehicles on Magor Road and by one vehicle on the B4245 (west).

6.9.35 The Sensitivity Test with traffic from the Vinegar Hill development shows that the junction is close to capacity in the PM peak, with the RFC increasing to 0.95. When a junction reaches the theoretical capacity in ARCADY, queues and delays exponentially increase. As this junction is close to its capacity, the queues increase by approximately six vehicles on Magor Road and by three vehicles on the B4245 (west).

6.9.36 As part of the M4 scheme, the existing B4245/ East Facing Steelworks Road Slips roundabout and the existing B4245/ West Facing Steelworks Road Slips signalised junction will be improved into one roundabout junction. This TA has not included an assessment of this improved junction, as it has been assumed that it will be designed to operate within the context of a strategic modelling assessment.

B4245/ WEST FACING STEELWORKS ROAD SLIPS (SIGNALISED JUNCTION)

6.9.37 The B4245 / West Facing Steelworks Road Slip is a signalised junction to the west of the development site, which provides access to the M4. It has been modelled using LinSig, and a summary of the Base Year results are shown in Table 30. These results represent how the junction currently operates, which is well within capacity, with minimal delays.

Table 30: Summary of B4245 / West Facing Steelworks Road Base Year LinSig Assessment

B4245 / WEST FACING STEELWORKS SIGNALISED JUNCTION	AM (07:30 – 08:30)			PM (16:30 – 17:30)		
	Queue (PCU)	Delay (Secs)	DOS (%)	Queue (PCU)	Delay (Secs)	DOS (%)
2016 BASE YEAR						
Newport Road	3.6	78.2	61.4	5.0	20.9	50.3
B4245 (east)	12.2	10.7	62.0	4.4	19.2	50.6
B4245 (west)	3.7	60.4	60.0	2.6	32.8	49.0

6.9.38 The model has been compared with the queue length surveys, and it is considered that the LinSig model is representative of junction performance.

6.9.39 Table 31 provides a summary of the modelling results for the 2018 Opening Year at the A4245/West Facing Steelworks Road signalised junction.

Table 31: Summary of B4245 / West Facing Steelworks Road Opening Year LinSig Assessment

B4245 / WEST FACING STEELWORKS SIGNALISED JUNCTION	AM (07:30 – 08:30)			PM (16:30 – 17:30)		
	Queue (PCU)	Delay (Secs)	DOS (%)	Queue (PCU)	Delay (Secs)	DOS (%)
2018 OPENING YEAR BASE						
Newport Road	3.7	77.6	65.4	5.5	22.1	53.5
B4245 (east)	13.0	11.2	66.1	4.7	19.2	52.9
B4245 (west)	3.7	57.0	60.7	2.8	33.7	52.4
2018 OPENING YEAR BASE + ROCKFIELD DEVELOPMENT						
Newport Road	3.8	78.7	67.4	5.7	22.5	55.4
B4245 (east)	14.5	11.5	69.4	5.1	19.6	55.6
B4245 (west)	4.2	62.6	68.5	3.0	34.0	54.7
2018 OPENING YEAR BASE + ROCKFIELD AND VINEGAR HILL DEVELOPMENTS (SENSITIVITY TEST 1)						
Newport Road	3.9	80.8	68.7	6.2	25.0	58.5
B4245 (east)	16.5	12.3	73.2	5.6	19.8	58.4
B4245 (west)	4.6	64.8	72.8	3.4	34.3	57.8

6.9.40 The results show that the signalised junction operates well within capacity in all opening year scenarios, and that the Rockfield development does not adversely affect this junction. Sensitivity Test 1 shows that there is a marginal increase in queues and delay with the additional traffic from the Vinegar Hill development.

6.9.41 Table 32 below provides a summary of the modelling results for the 2026 Design Year at the signalised junction.

Table 32: Summary of B4245 / West Facing Steelworks Road Design Year LinSig Assessment

B4245 / WEST FACING STEELWORKS SIGNALISED JUNCTION	AM (07:30 – 08:30)			PM (16:30 – 17:30)		
	Queue (PCU)	Delay (Secs)	DOS (%)	Queue (PCU)	Delay (Secs)	DOS (%)
2026 DESIGN YEAR BASE						
Newport Road	4.3	84.6	68.5	5.8	22.7	56.5
B4245 (east)	16.2	12.2	69.4	5.1	19.6	55.8
B4245 (west)	4.3	62.2	63.6	3.0	34.3	55.4
2026 DESIGN YEAR BASE + ROCKFIELD DEVELOPMENT						
Newport Road	4.1	81.2	70.5	6.1	23.2	58.5
B4245 (east)	16.5	12.7	73.7	5.4	20.0	58.4
B4245 (west)	4.5	63.8	71.3	3.2	34.5	57.7
2026 DESIGN YEAR BASE + ROCKFIELD AND VINEGAR HILL DEVELOPMENTS (SENSITIVITY TEST 1)						
Newport Road	4.6	88.3	71.7	7.3	27.7	61.3
B4245 (east)	20.2	13.7	76.6	6.4	21.0	61.2
B4245 (west)	5.2	70.4	75.1	4.0	38.2	61.0

6.9.42 The results show that the junction operates within capacity, with a marginal increase in the DOS with the additional traffic from the developments.

6.10 JUNCTION ASSESSMENT SUMMARY

6.10.1 The junction assessments demonstrate that there is sufficient capacity in the local highway network to accommodate the traffic generated by the proposed Rockfield Farm development.

6.10.2 Sensitivity Tests 1 have shown that with the additional traffic from the Vinegar Hill development, the local highway network continues to operate within capacity. However, the B4245 / East Facing Steelworks Road Slips roundabout has been modelled as approaching capacity with the full development in the PM peak of the Design Year.

6.10.3 The impact of the Vinegar Hill development on the proposed shared site access priority junction has been considered. The tests have shown that a priority junction operates within capacity with the additional traffic, although queues and delays were observed on the site access arm.

6.10.4 The assessments assume all trips are new to the network, and 100% of the development traffic uses the proposed site access junction. As such, the analysis is considered robust and no further assessments or mitigation measures are considered necessary.

6.10.5 Sensitivity Tests 2 show that with the M4 improvements, queues and delays reduce in all junctions that have been assessed. This is predominately due to fewer vehicles turning right from the minor arm and instead turning left towards the new motorway junction east of Undy, as well as a reduction in traffic along the B4245.

6.11 LINK CAPACITY ASSESSMENT

6.11.1 The DMRB[9] provides a guide to the capacity of Urban All-Purpose Roads (UAP). These are defined as roads within a built-up area, either a single carriageway with a speed limit of 40 mph or less or a dual carriageway with a speed limit of 60 mph or less. The capacity is defined as the maximum sustainable flow of traffic passing in 1 hour, under favourable road and traffic conditions.

6.11.2 The Road Types outlined in the advice includes UAP3. This is a variable standard road carrying mixed traffic with frontage access, side roads, bus stops, and at-grade pedestrian crossings. This road type also has a speed limit of between 30mph to 40mph, as well as unrestricted parking and loading. These features are considered to match that of the B4245 through Magor/Undy.

6.11.3 The one-way hourly flow capacity in each direction of a two-way single carriageway with 2 lanes are identified in Table 33, and highlights UAP3.

Table 33: Capacities of Urban Roads One-way hourly flows in each direction (Table 2 DMRB)

TWO-WAY SINGLE CARRIAGEWAY- BUSIEST DIRECTION FLOW

(ASSUMES A 60/40 DIRECTIONAL SPLIT)

ROADS WITH 2 LANES

Carriageway Width		6.1m	6.75m	7.3m	9.0m
Road Type	UAP1	1,020	1,320	1,590	1,860
	UAP2	1,020	1,260	1,470	1,550
	UAP3	900	1,110	1,300	1,530
	UAP4	750	900	1,140	1,320

6.11.4 The B4245 through Magor/Undy varies in width, for instance, it measures approximately 7.6m adjacent the site, approximately 9.1m adjacent Pennyfarthing Lane, and approximately 6.75m adjacent Blenheim Avenue.

6.11.5 In the 2016 Base Year, the highest flow was observed to the east of the Steelworks Roundabout in the AM and PM peaks (977 and 976 respectively). The B4245 carriageway in this location measures approximately 7.3m before the flare. Using Table 33, the capacity is 1,300 vehicles per hour. The B4245 is therefore within capacity.

6.11.6 In the 2018 Opening Year with development (Rockfield Farm and Vinegar Hill), the largest flow on the link remains at the Steelworks Roundabout, with flows of 1,179 in the AM peak and 1,146 in the PM peak. In the 2026 Design Year with development, the flows in the AM and PM peaks increase to 1,242 and 1,205 respectively. Therefore, the B4245 remains within capacity in all scenarios.

6.11.7 This assessment demonstrated that safeguarding a route for a Magor/Undy by-pass to the south of the site as set out in the LDP is not necessary to facilitate the Rockfield Farm development in any of the development scenarios tested.

[9] Volume 5, Section 1, Part 3: Traffic Capacity of Urban Roads

7 TRANSPORT IMPLEMENTATION STRATEGY

7.1 INTRODUCTION

7.1.1 MCC's LDP identifies that all planning applications for developments that are likely to have a significant impact on trip generation and travel demand must be accompanied by a Transport Assessment that includes Transport Implementation Strategy (TIS). The LDP identifies that the TIS should detail the measures proposed to improve access by public transport, walking and cycling and reduce the number and impacts of car journeys associated with the proposal.

7.1.2 This section sets objectives for the development in relation to MCC's LDP, and outlines the measures identified to achieve them. It provides a summary of the proposed improvements and design principles that will ensure that safe, secure, and attractive access for all modes are considered.

7.1.3 This section also establishes how to encourage modal shift and sustainable travel choices for future residents and employees at the Rockfield Farm site. It considers how the development will link into the adjoining strategic allocation at Vinegar Hill to ensure a cohesive design for the site as a whole.

7.2 DEVELOPMENT OBJECTIVES

7.2.1 MCC's LDP identifies objectives to build sustainable communities, provide a sufficient level of housing, and support an economy with employment opportunities. Achieving sustainable accessibility is also a key issue, by providing opportunities for integrated sustainable transport, for increased walking, cycling, and use of public transport, for reducing reliance on the private motor car and for reducing the need to travel.

7.2.2 The policies within the LDP outline that, where appropriate, development proposals should:

- Promote sustainable, safe forms of transport
- Integration with sustainable transport facilities
- Ensure a safe, secure, pleasant, and convenient environment that is accessible to all members of the community
- Link into the existing or proposed public rights of way, walking, cycleway, and green infrastructure networks
- Maintain reasonable levels of privacy and amenity of neighbouring properties
- Make satisfactory provision for access, circulation, and parking
- Minimise the adverse effects of parking

7.3 MEASURES

ACCESS ARRANGEMENTS

7.3.1 The proposals include a new site access from the B4245 to the east of Rockfield Grove. The master plan (WYG, 2016) outlines that primary vehicular and pedestrian access will be taken from the B4245 via a priority junction at the south-east corner of the site. A detailed design for this has been prepared by WSP | PB, and is included in Appendix H. Vehicular access to The Elms from Rockfield Grove would be prevented to avoid its use as a rat run.

INTERNAL ROAD NETWORK

7.3.2 The primary access road will be the main road for distribution of traffic through the site, both for the residential and employment areas and also allow for connection to the Vinegar Hill site to the west. This will ensure convenient access for all users. Furthermore, as the access to the developments will be from a new priority junction onto the B4245, the impact on the neighbours in the adjacent residential estates will be minimal.

7.3.3 The primary access road passes through the site from east to west via two junctions with The Elms, which will be upgraded with the extra width accommodated through the removal of a low-value hedge and fence line along its eastern edge.

7.3.4 The internal layout of the development site will be designed to current standards and will incorporate additional safety measures. The master plan outlines that the local street within the development would consist of a corridor of approximately 21m in width. This would consist of a 5.5m wide carriageway to accommodate public transport, emergency and delivery vehicles, and 2m footways to either side. The design speed for local streets would be 20 mph.

7.3.5 The design of the internal road layout will ensure safe and convenient movement across the site and into the adjacent developments that is accessible to all members of the community.

PARKING PROVISION

7.3.6 As specified in the LDP, car parking provision will be made in accordance with the Monmouthshire Parking Standards SPG (2013). This outlines that new build residential developments should provide 1 space per bedroom (up to a maximum of 3 spaces) for residents and 1 space per 5 units for visitors.

7.3.7 The master plan for this development (WYG, 2016) has outlined that the parking will generally be made in-plot with some properties benefiting from a private garage. Additional allowance will be made for visitor parking on street in publicly accessible locations. This should be a satisfactory provision that minimises the adverse effects of parking and maintains the amenity of neighbouring properties. Provision of sufficient spaces should also ensure a secure and pleasant environment.

7.3.8 The parking standards for office developments over 1,000m^2 within zones 2 to 4 is 1 space per 40m^2, equating to 140 spaces. 7 of these spaces are recommended to be designated for Blue Badge holders, and an additional 7 spaces are required for motorcycle parking provision.

7.3.9 Appendix 2 of the Parking Standards will be used in the design process to determine the layout of the parking areas and the minimum dimensions for each space. This should allow a satisfactory provision of circulation and access.

WALKING AND CYCLING

7.3.10 A number of measures are proposed within the development to improve the local environment for and encourage use by pedestrians and cyclists, enabling accessibility for all members of the community. These include:

- Low speed development with good quality footpath and footway provision and informal crossing facilities throughout.
- Permeability through the site primarily provided through a re-routed and improved public right of way.
- A green corridor through the site providing a local walking/cycling network including north-south connections and connecting to the adjacent Vinegar Hill site.
- Primary pedestrian access established from the B4245 adjacent the vehicle access at the southeast corner of the site. This access will feature a formalised pedestrian crossing point with dropped kerbs, tactile paving, and a refuge island similar to Rockfield Grove.
- Secondary access for pedestrians and cyclists maintained via The Elms.
- Cycle parking in accordance with current standards.

7.3.11 The proposed internal network is based on a combination of low speed residential streets with adjoining footways, designed to provide natural traffic calming and a variety of street-edge treatments will be used to create different street characters.

7.3.12 A street hierarchy will be used that carefully balances the needs of cars, pedestrians, and cyclists. Where possible, it will be ensured that within each development area the roads will have a design speed of 20 mph or less, negating the need for designated cycle lanes by providing streets that can be safely shared by pedestrians, cyclists, and cars.

7.3.13 The development will include ‘home zones’, where streets would prioritise the needs of pedestrians and cyclists through providing a narrower corridor with less distinction between the carriageway and pedestrian areas to provide a low-speed access route. The streets would include areas of on-street parking, street furniture and planting to provide informal traffic calming with design speeds of 5 to 10 mph depending on their location within the development.

7.3.14 A connection with existing footway provision within Undy is provided via the access currently provided from The Elms. This will be maintained to ensure the site is well connected to existing residential areas to the south of the site. It is proposed that with the development of the site, The Elms would be upgraded to the same dimensions as the local street type.

7.3.15 The designs include supporting and improving existing public rights of way by opening up the site and improving linkages to existing residential areas, for instance Rockfield View, and to the future Vinegar Hill development. This will create well-connected neighbourhoods that encourage movement on foot and by bicycle.

7.3.16 Cycle parking will be provided on site in accordance with current standards in convenient locations throughout the development. The standards for residential dwellings is only required for apartments, and state that there should be 1 stand per 5 bedrooms. The specific quantum of each house type has not been determined, and therefore the number of stands cannot be confirmed at this stage.

PUBLIC TRANSPORT

7.3.17 The bus stops on the B4245 are within the recommended walking distance of 400m from the south of the site, and are served by Newport bus service 74 on an hourly basis between Chepstow and Newport.

7.3.18 The development will be served by local bus services and the design of highway and pedestrian links will accommodate this. As discussed above, the design of the local street within the development would consist of a 5.5m wide carriageway.

7.3.19 Severn Tunnel Junction is located 2.6km east of the site and provides railway access to Fishguard, Cardiff, Bristol, Portsmouth, Exeter, and Gloucester. A second station is located at Caldicot, 3.5 km to the east of the site.

7.3.20 In the Monmouthshire LTP, MCC have prioritised the Magor & Undy Active Travel Network scheme. This involves developing and implementing an active travel plan for Magor & Undy, and includes a Rogiet to Magor footway/cycleway. This will provide a continuous sustainable route between Caldicot and Newport along the B4245 and A4810 corridors, and will improve the accessibility and integration of the Rockfield Farm site with sustainable transport facilities.

7.3.21 The Magor and Undy Walkway Station is listed as a priority in the LTP, and is referenced in the National Transport Finance Plan, Network Rail's draft Wales Route Strategy, and in the current Metro Phase 2 list of optional schemes. The proposed location on the South Wales Mainline is accessed from the B4245 between the villages of Magor and Undy. Should this scheme go forward, a railway station would then be within approximately 1km from the development site.

LOCAL HIGHWAY NETWORK

7.3.22 The assessment of the local highway network, the scope of which was agreed with MCC, has demonstrated that the development traffic can be accommodated without the need for mitigation measures. As such, the development proposals do not include any highway improvements to the local network.

7.4 TARGETS AND MONITORING

7.4.1 The aim of the TIS is to reduce the number and impacts of car journeys associated with the proposal. It should also establish how to encourage modal shift and sustainable travel choices for future residents and employees at the Rockfield Farm site.

7.4.2 One way to encourage sustainable behaviour and reduce private car trips to a development is through the implementation of a Travel Plan. The Framework Residential Travel Plan, produced by Capita, has been included within Appendix G of this report. It proposes a range of measures and initiatives that should be introduced to help ensure modal shift to sustainable travel modes.

7.4.3 It is anticipated that the successful implementation of the Travel Plan will progress a range of benefits for the local residents including the promotion of healthy lifestyles associated with sustainable travel; informed choices on travel alternatives within the surrounding area; environmental benefits of not using the car; and financial incentives/savings that could be associated with sustainable travel.

7.4.4 An important aspect of achieving modal shift away from the car is the setting of realistic and achievable targets and objectives. Those set out within the Travel Plan are indicative and subject to agreement with the Local Authority although do provide a good baseline for progressing the aims of the Travel Plan.

7.4.5 As well as providing details of existing alternative travel choices, the travel plan also contains specific, site-related measures and initiatives to ensure the success of the travel plan in meeting its objectives. The measures and initiatives to be implemented at the site are discussed above, including the use of secure cycle parking in convenient locations, safe pedestrian footways, and sufficient parking provision.

7.4.6 The employment use at the site will also employ a dedicated travel plan co-ordinator, who will be responsible for maintaining the Travel Plan, and promoting the associated incentives.

7.4.7 Monitoring of targets is also set out in the Travel Plan, and includes a recommendation for an annual travel survey, as well as tracking the use of sustainable transport incentives.

8 CONCLUSION

8.1.1 WSP | Parsons Brinckerhoff (WSP | PB) were commissioned by Monmouthshire County Council (MCC) to provide transportation and highway advice for the proposed mixed use development of the Rockfield Farm site, Magor/Undy.

8.1.2 This Transport Assessment has been undertaken based on a potential the development of up to 345 new dwellings and 5,575m^2 of B1 offices on the LDP candidate site (policy SAH5), which has been allocated for mixed use. The proposed development is in accordance with National, Regional, and Local land use, housing, and transportation policies.

8.1.3 Vehicular access to the development will be gained via a new priority T-junction to the east of the site onto the B4245 (shown in Appendix H). An alternative option that would provide vehicular access via a 3-arm roundabout with the B4245 has also been tested. Both of these options have been assessed and will accommodate the traffic from Rockfield Farm as well as traffic from the proposed adjacent development known as Vinegar Hill.

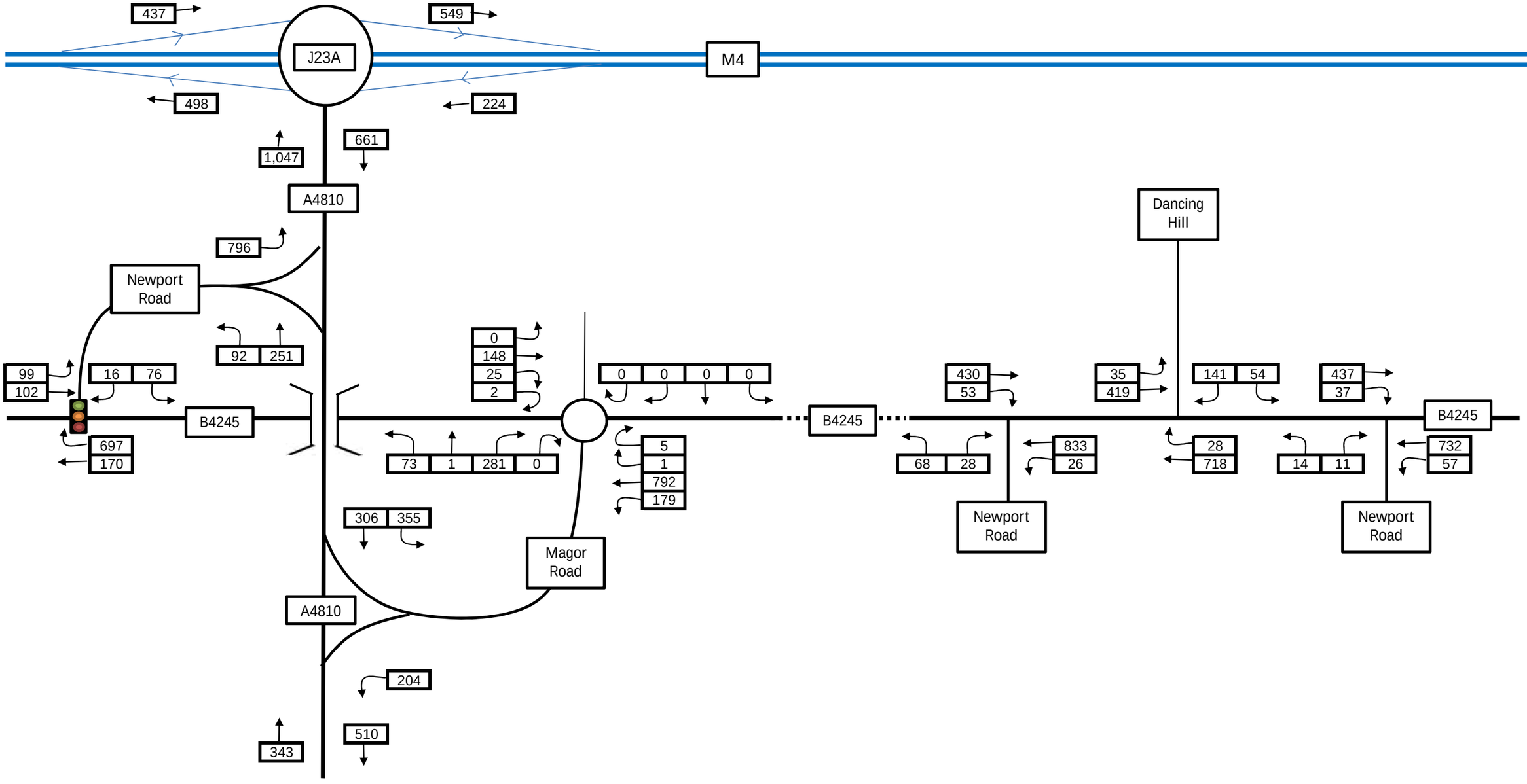
8.1.4 Junction Capacity Assessments and a Link Capacity Assessment have predicted that the local highway network will continue to operate within capacity, despite the increase in traffic associated with various development scenarios. The impact of the Rockfield Farm development is considered to be minimal. The assessment has also demonstrated that safeguarding a route for a Magor/Undy by-pass to the south of the site as set out in the LDP is not necessary to facilitate the Rockfield Farm development in any of the development scenarios tested.

8.1.5 Improvements to the local pedestrian and cycle environment have been considered, with connections to the existing residential network via The Elms. There will be a green corridor providing a local walking cycling network connecting to the adjacent Vinegar Hill site. New pedestrian crossing and footway improvements to the B4245 adjacent the site are also proposed as part of the vehicular access arrangements.

8.1.6 The Transport Implementation Strategy (TIS) included as part of this TA has set objectives in line with the LDP and recommended a range of measures – in particular to improve access for non-motorised users – to encourage modal shift from single occupancy car use. The TIS further recommends an annual travel survey to monitor the impacts of the Travel Plan.

8.1.7 In conclusion and based on the findings of this report, it is considered that there are no valid highway or transportation reasons that should prevent the development proposals from being awarded planning consent.

TRAFFIC FLOW DIAGRAMS



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01/06/2016

Option 28

CLIENT
Monmouthshire County Council

PROJECT
Rockfield Farm Transport Assessment

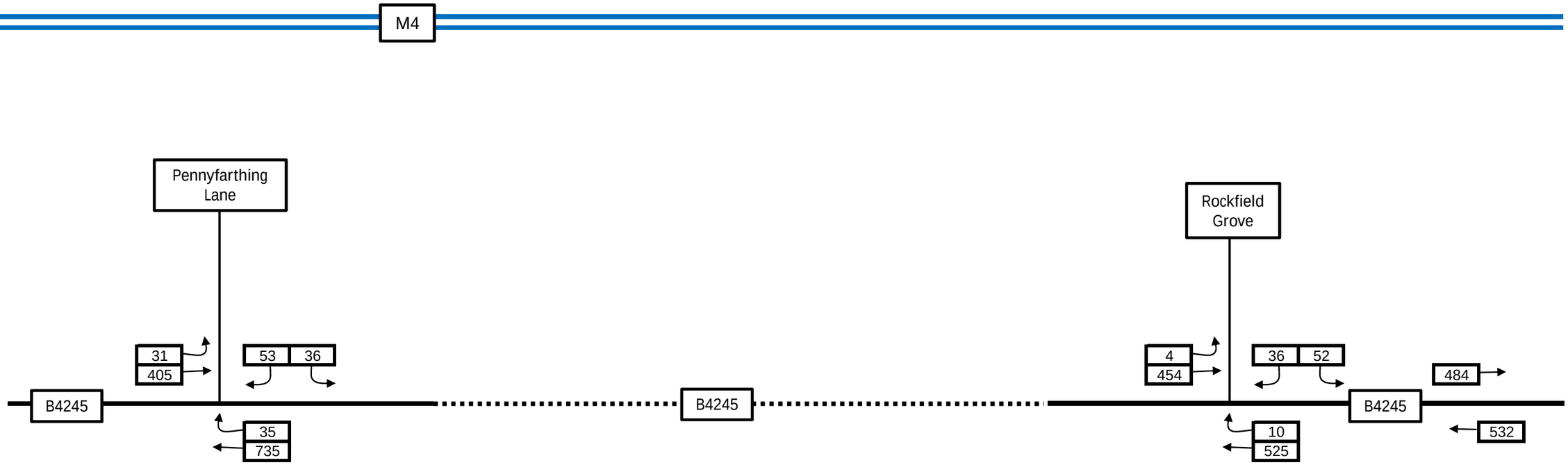
DRAWING NUMBER 1 .1

DRAWING TITLE
2016 AM Peak Observed Flows Through Magor

PRODUCED AS

CHECKED SV

APPROVED RJ



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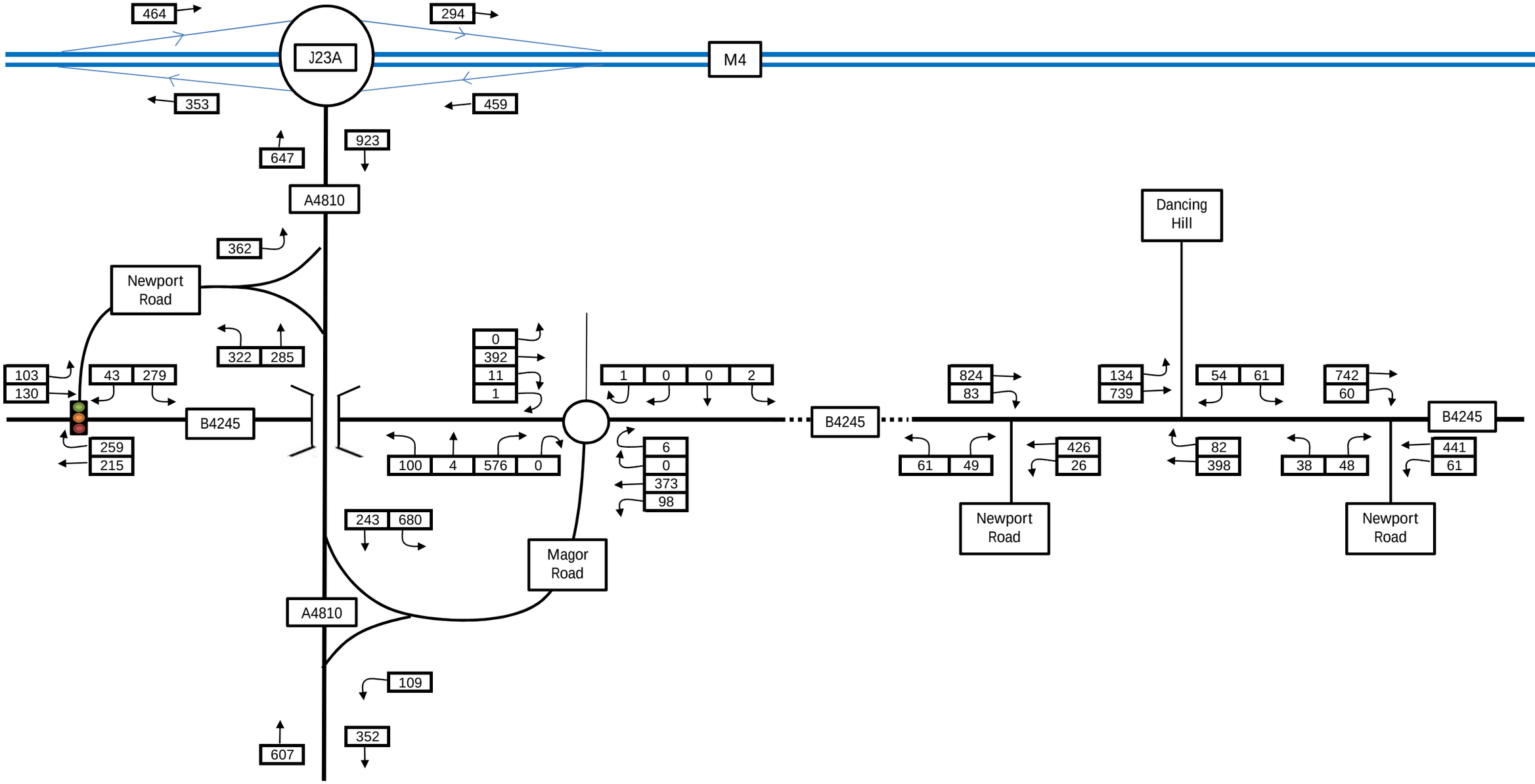
PROJECT
Rockfield Farm Transport Assessment

DRAWING NUMBER 1 .2

DRAWING TITLE
2016 AM Peak Observed Flows Through Undy

PRODUCED	AS
CHECKED	SV
APPROVED	RJ



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Option 33

CLIENT
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PROJECT
Rockfield Farm Transport Assessment

DRAWING NUMBER 2 .1

DRAWING TITLE
2016 PM Peak Observed Flows Through Magor

PRODUCED AS

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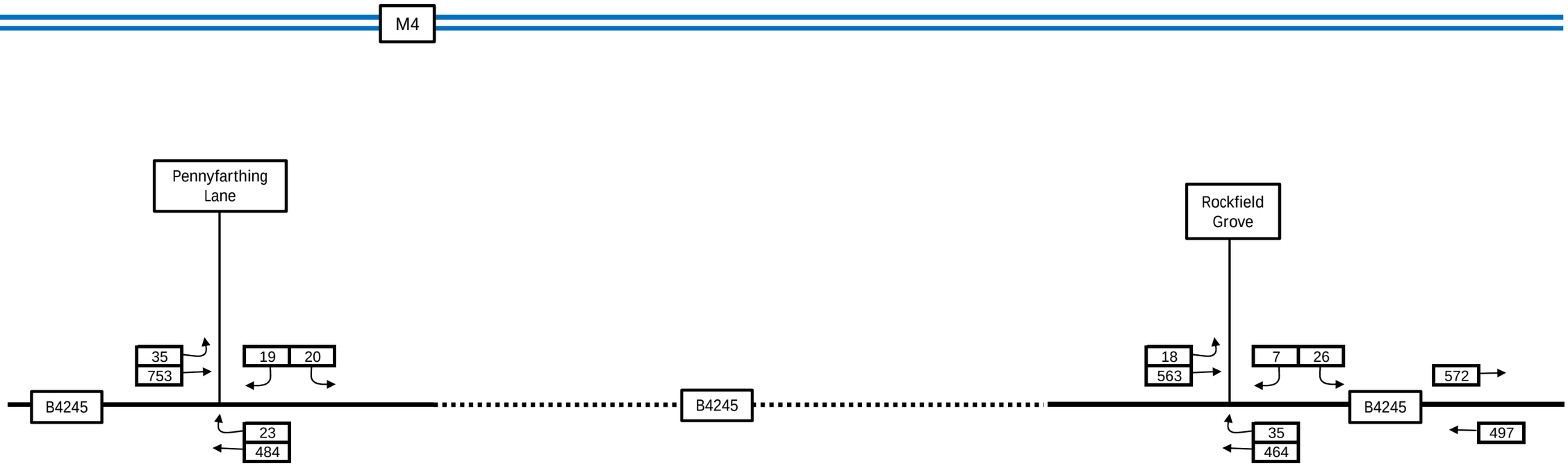

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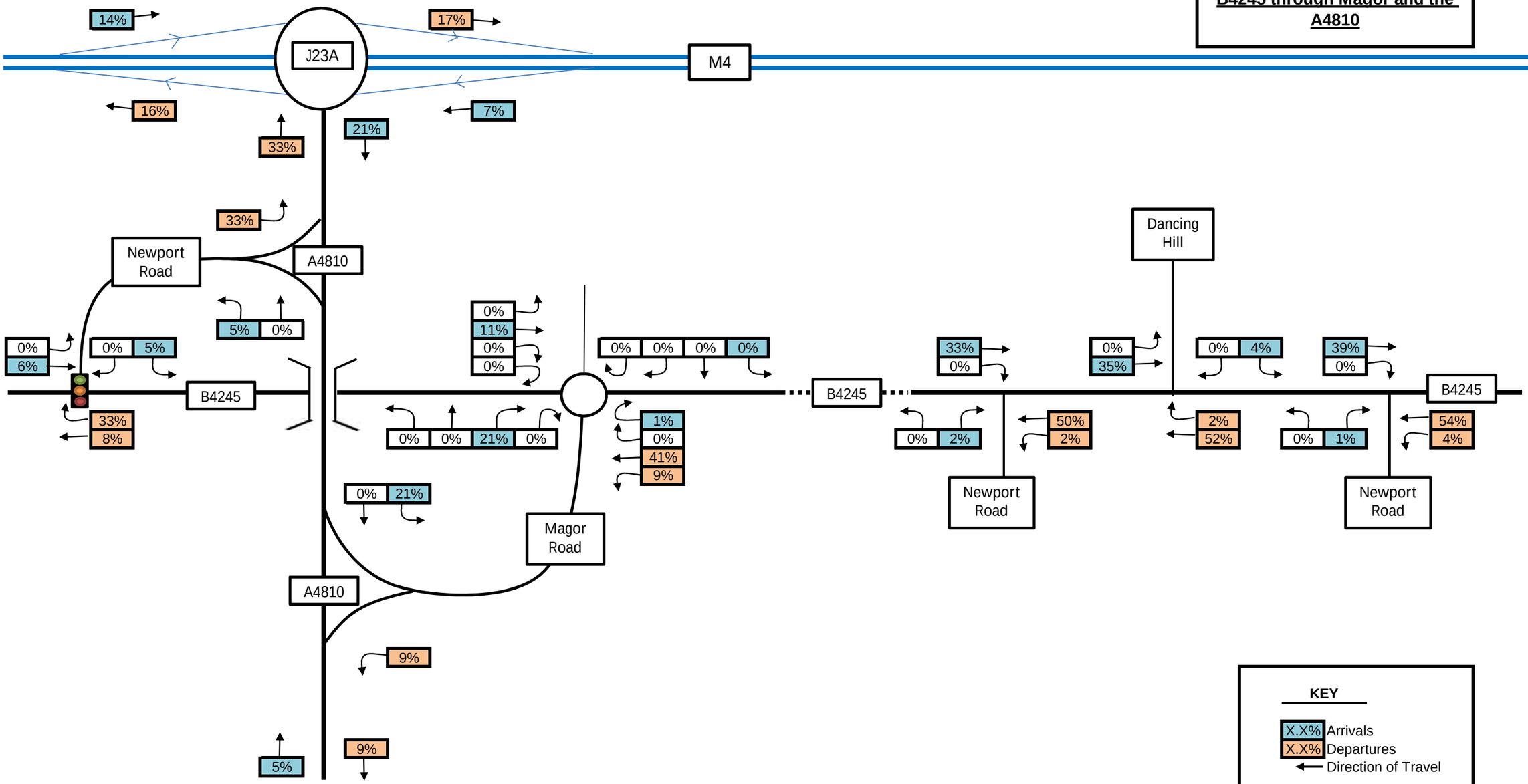
PROJECT
Rockfield Farm Transport Assessment

DRAWING NUMBER 2 .2

DRAWING TITLE
2016 PM Peak Observed Flows Through Undy

PRODUCED	AS
CHECKED	SV
APPROVED	RJ

B4245 through Magor and the A4810



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Option 57

CLIENT
Monmouthshire County Council

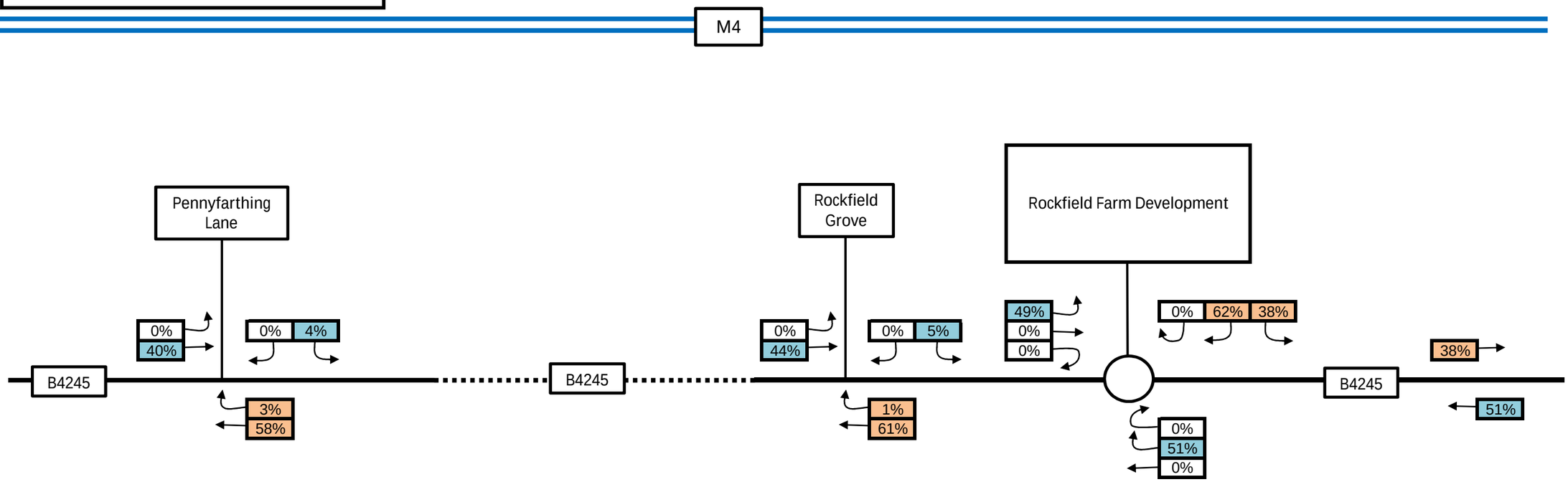
PROJECT
Rockfield Farm Transport Assessment

DRAWING NUMBER 3 .1

DRAWING TITLE
2016 Observed Distribution in AM Peak for Development Flows

PRODUCED	AS
CHECKED	SV
APPROVED	RJ

B4245 through Undy and South of Rockfield Farm Development Site



KEY

X.X% Arrivals
X.X% Departures
← Direction of Travel

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PROJECT
Rockfield Farm Transport Assessment

DRAWING NUMBER 3 .2

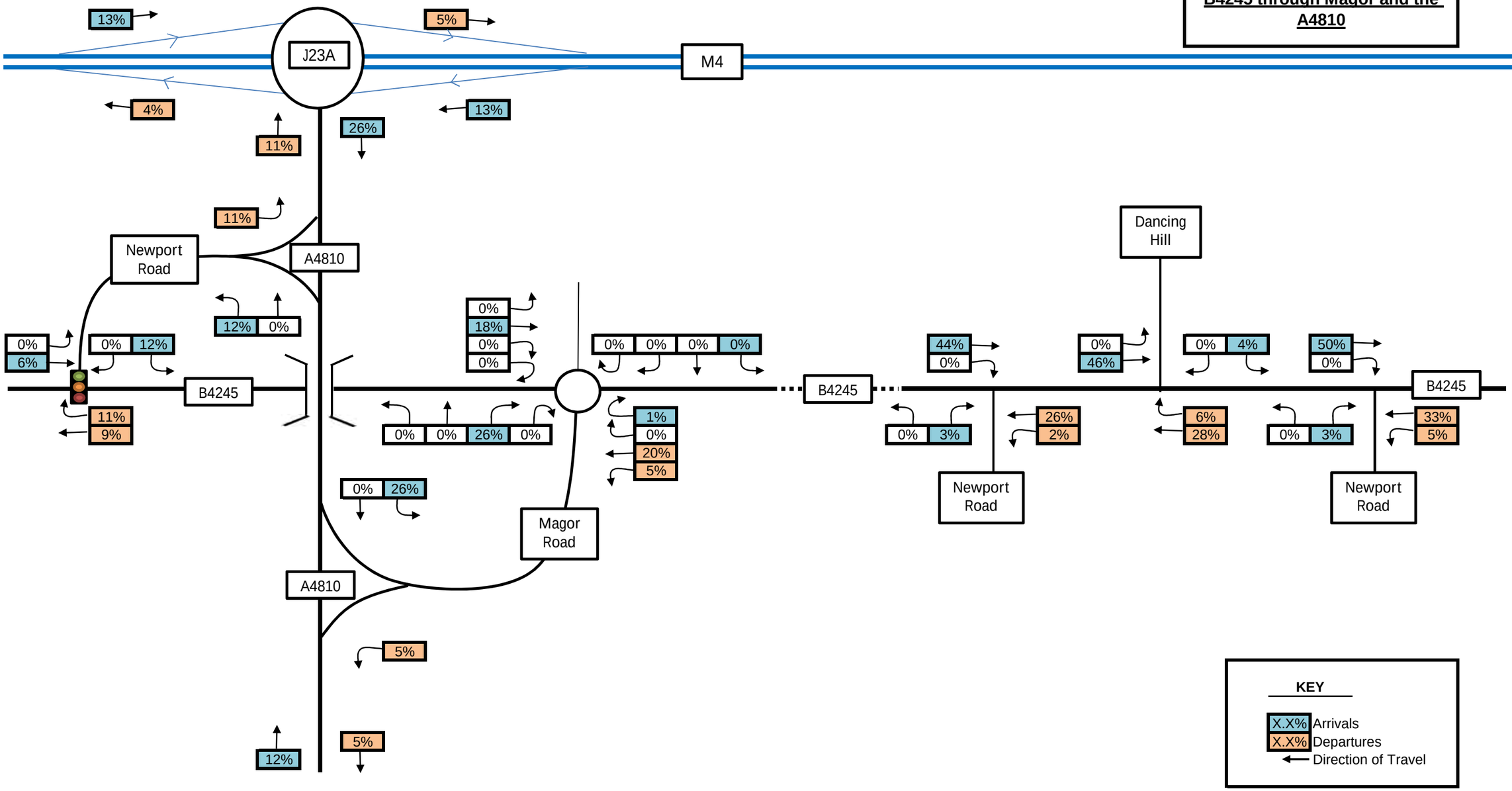
DRAWING TITLE
2016 Observed Distribution in AM Peak for Development Flows

PRODUCED AS

CHECKED SV

APPROVED RJ

B4245 through Magor and the A4810



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Option 58

CLIENT
Monmouthshire County Council

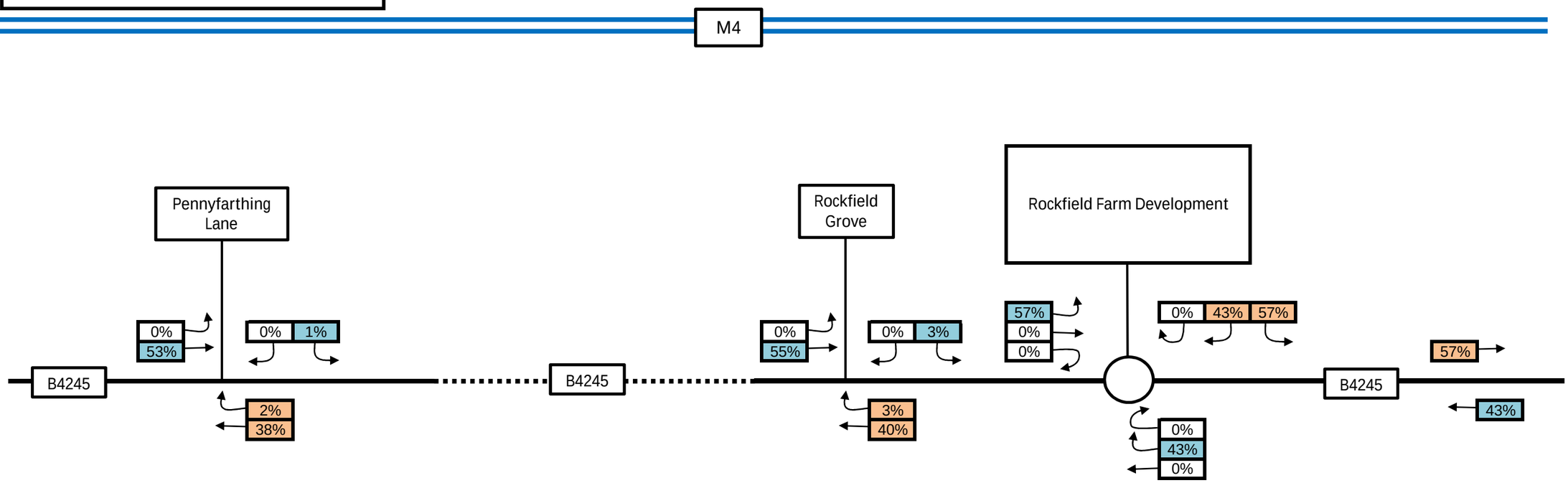
PROJECT
Rockfield Farm Transport Assessment

DRAWING NUMBER 4 .1

DRAWING TITLE
2016 Observed Distribution in PM Peak for Development Flows

PRODUCED	AS
CHECKED	SV
APPROVED	RJ

B4245 through Undy and South of Rockfield Farm Development Site



KEY

X.X% Arrivals
X.X% Departures
← Direction of Travel

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PROJECT
Rockfield Farm Transport Assessment

DRAWING NUMBER 4 .2

DRAWING TITLE
2016 Observed Distribution in PM Peak for Development Flows

PRODUCED AS

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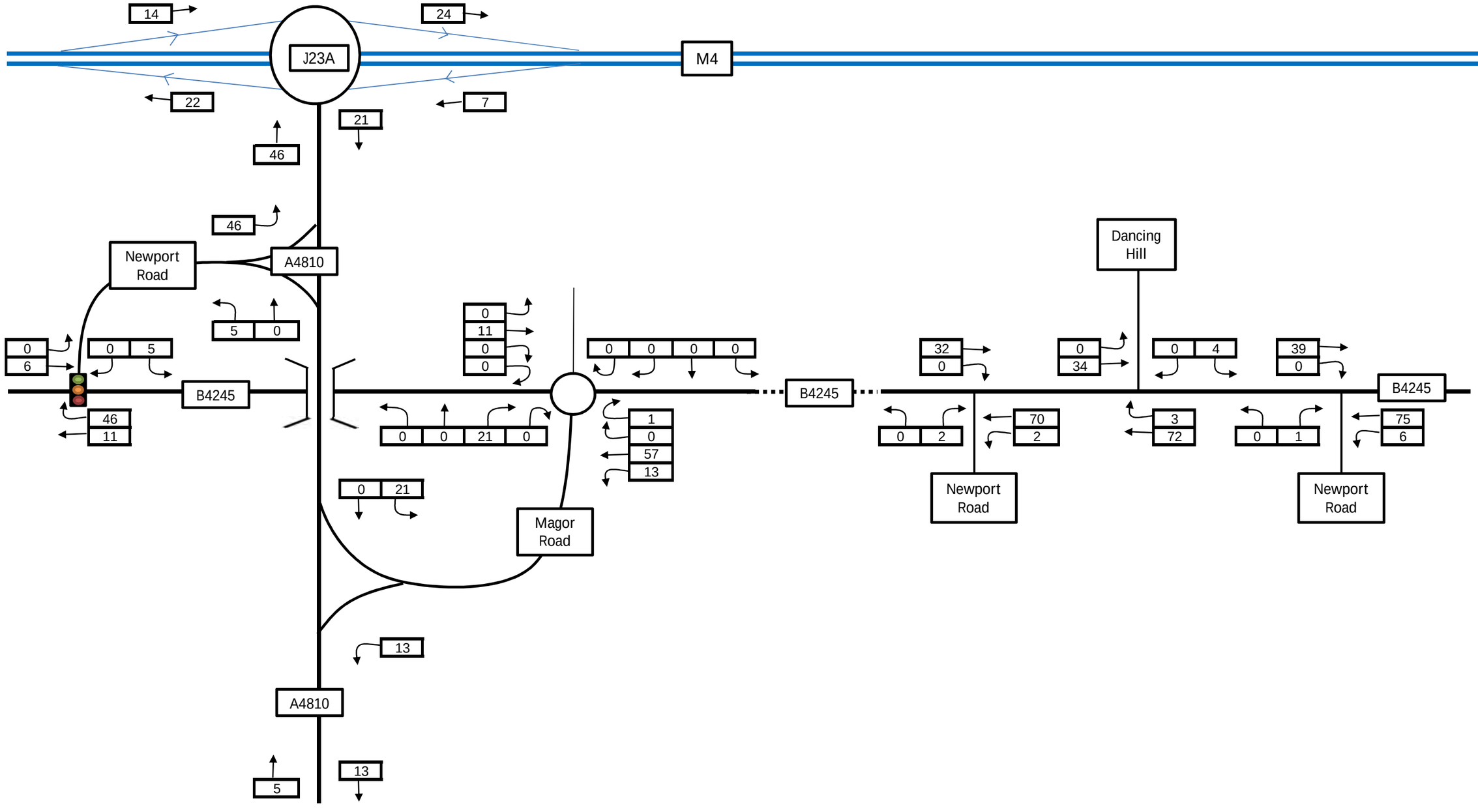

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01/06/2016

Option 65

CLIENT
Monmouthshire County Council

PROJECT
Rockfield Farm Transport Assessment

DRAWING NUMBER 5 .1

DRAWING TITLE
Rockfield Farm Development Flows
AM Peak

PRODUCED	AS
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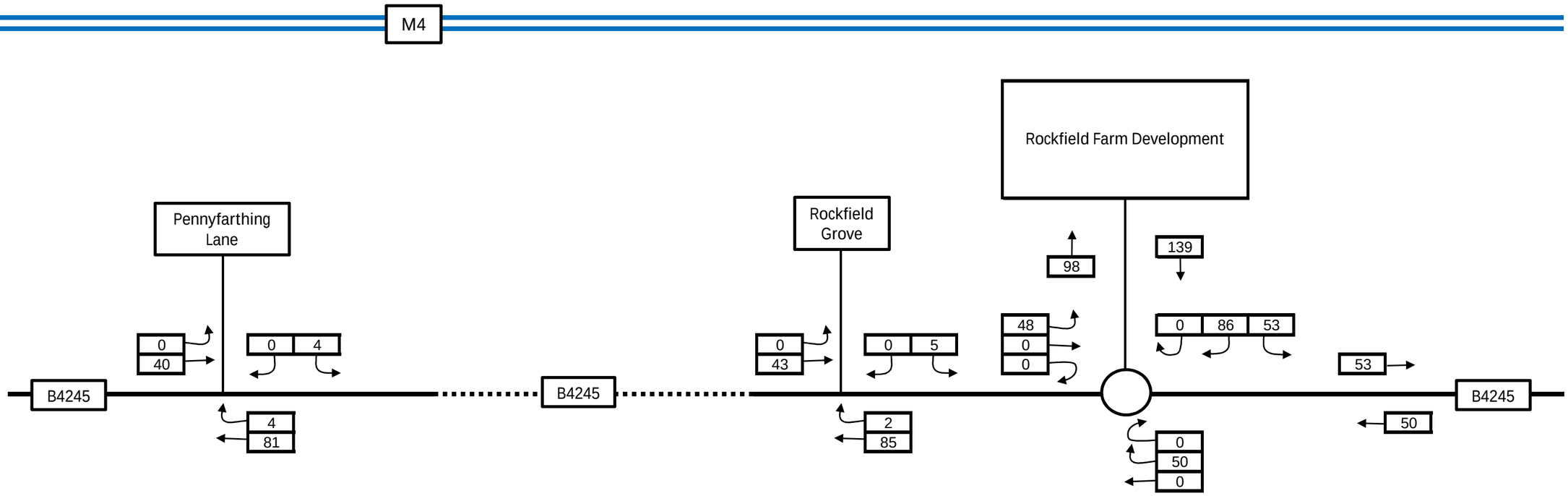
APPROVED	RJ



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PROJECT
Rockfield Farm Transport Assessment

DRAWING NUMBER 5 .2

DRAWING TITLE
Rockfield Farm Development Flows
AM Peak

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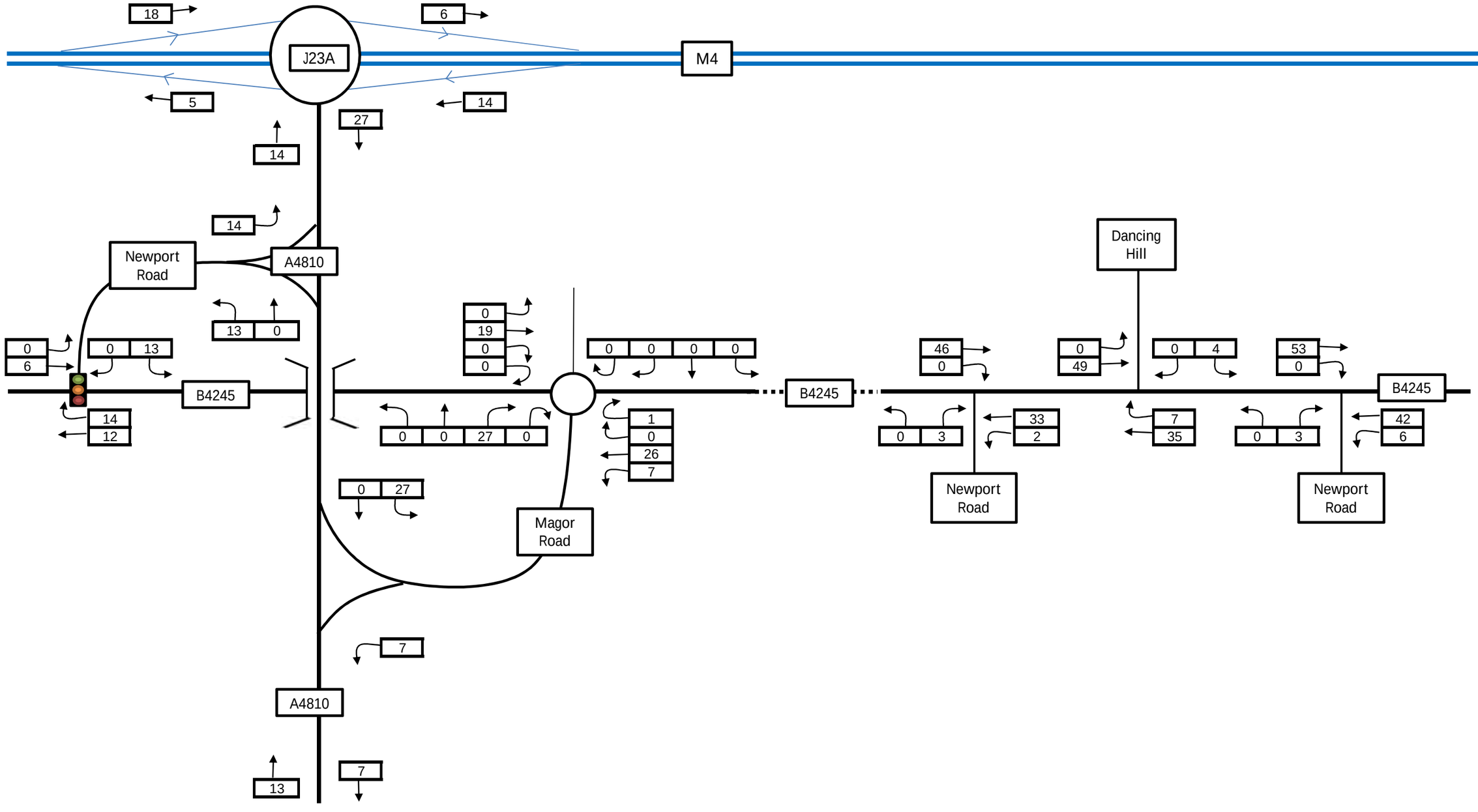

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Option 66

CLIENT
Monmouthshire County Council

PROJECT
Rockfield Farm Transport Assessment

DRAWING NUMBER 6 .1

DRAWING TITLE
Rockfield Farm Development Flows
PM Peak

PRODUCED	AS
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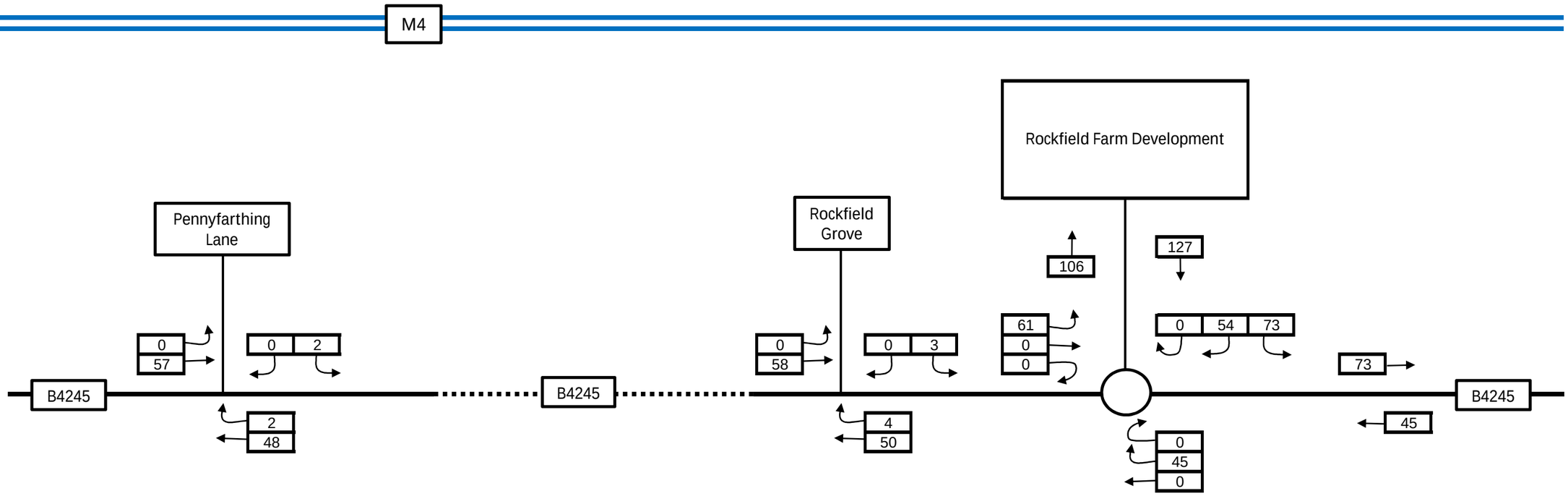
APPROVED	RJ



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PROJECT
Rockfield Farm Transport Assessment

DRAWING NUMBER 6 .2

DRAWING TITLE
Rockfield Farm Development Flows
PM Peak

PRODUCED AS

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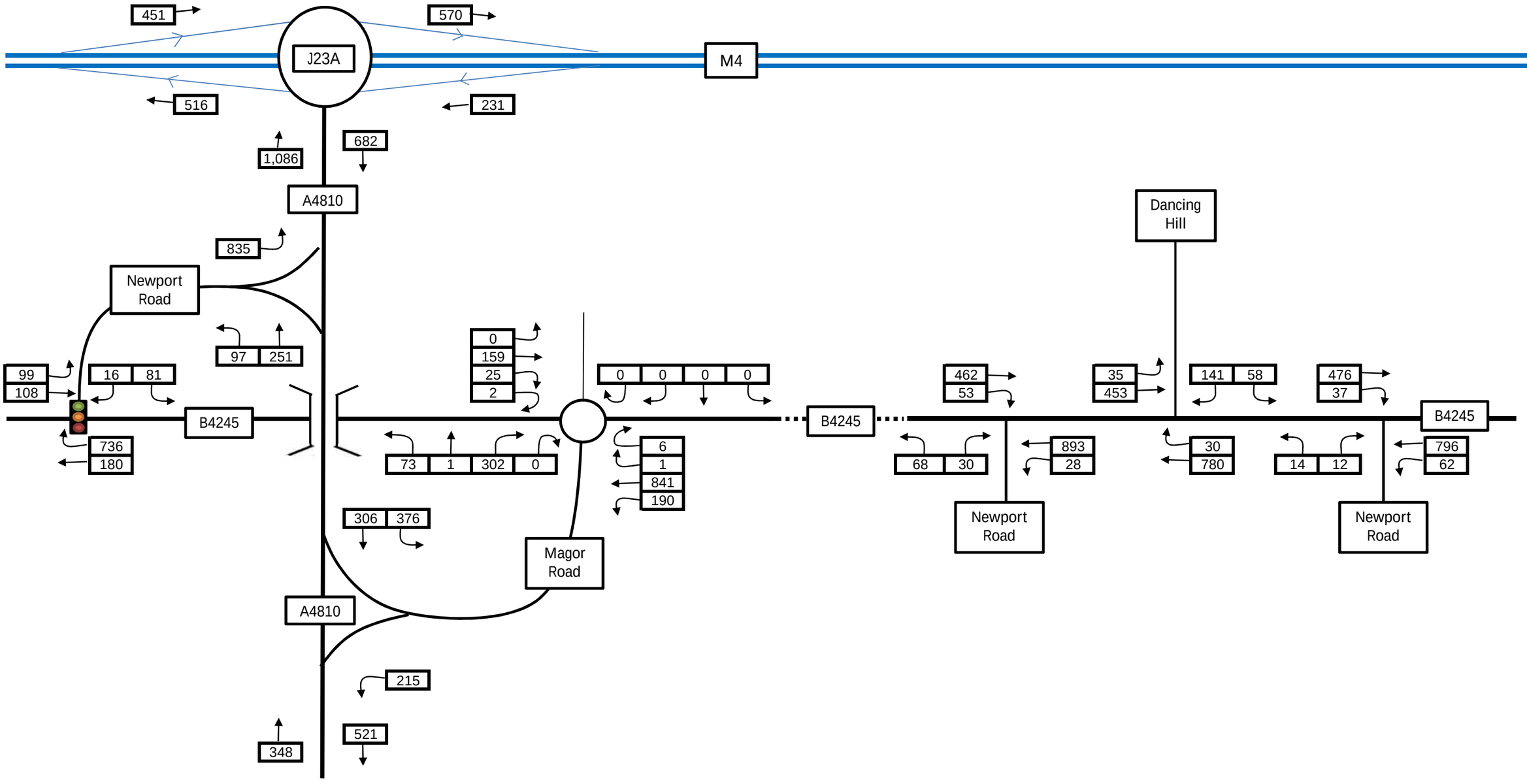

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Option 109

CLIENT
Monmouthshire County Council

PROJECT
Rockfield Farm Transport Assessment

DRAWING NUMBER 7 .1

DRAWING TITLE
2018 AM Peak Opening Year Base Flows (with Crick Road & Sudbrook Paper Mill Committed Developments)

PRODUCED AS

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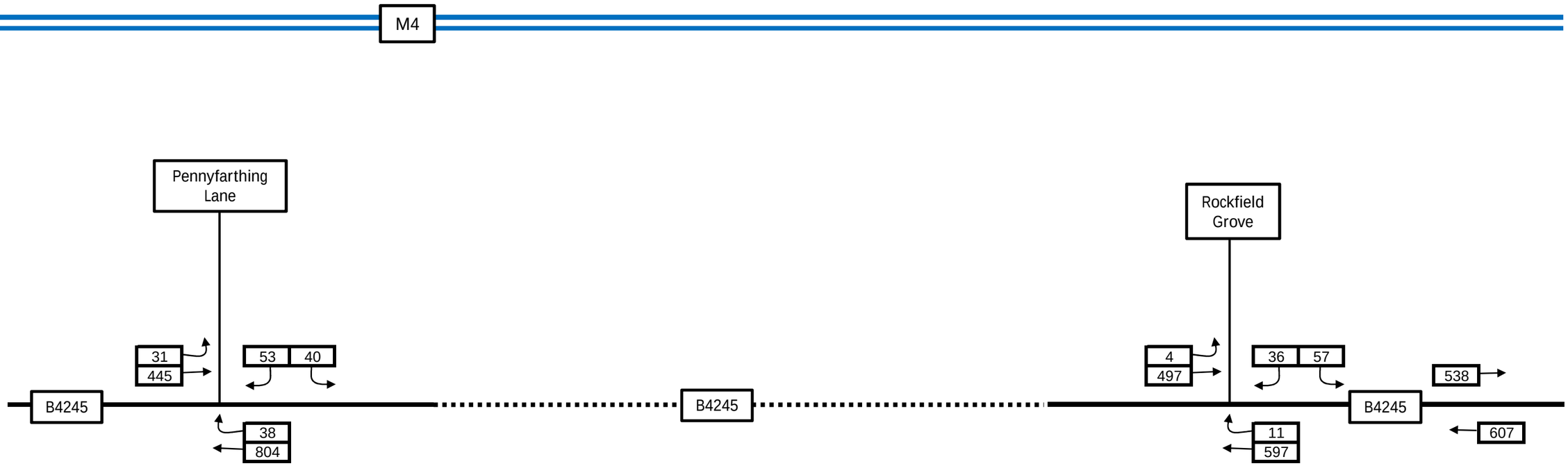
APPROVED RJ



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DATE
01/06/2016

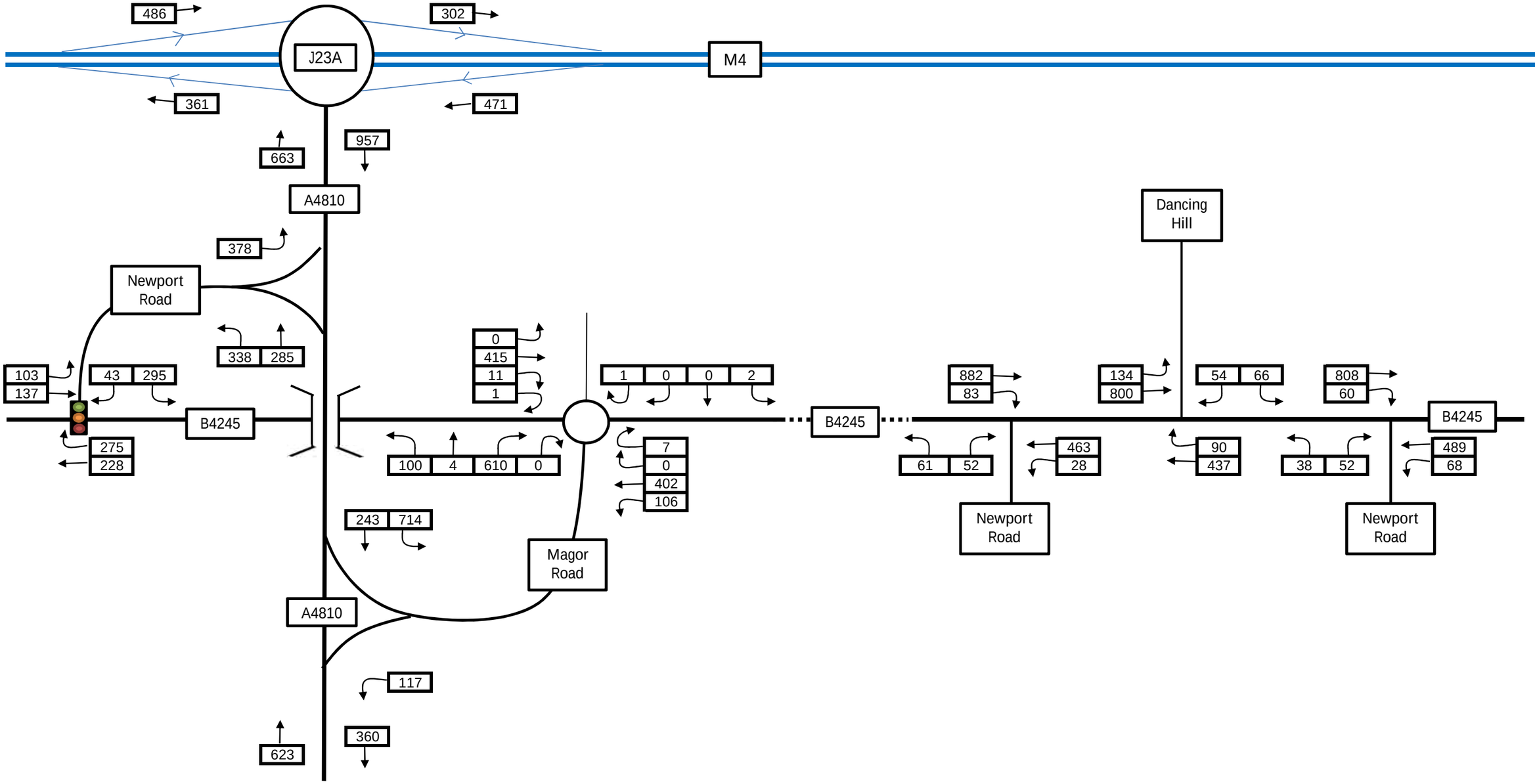
CLIENT
Monmouthshire County Council

PROJECT
Rockfield Farm Transport Assessment

DRAWING NUMBER 7 .2

DRAWING TITLE
2018 AM Peak Opening Year Base Flows
(with Crick Road & Sudbrook Paper Mill
Committed Developments)

PRODUCED	AS
CHECKED	SV
APPROVED	RJ



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DATE
01/06/2016

Option 114

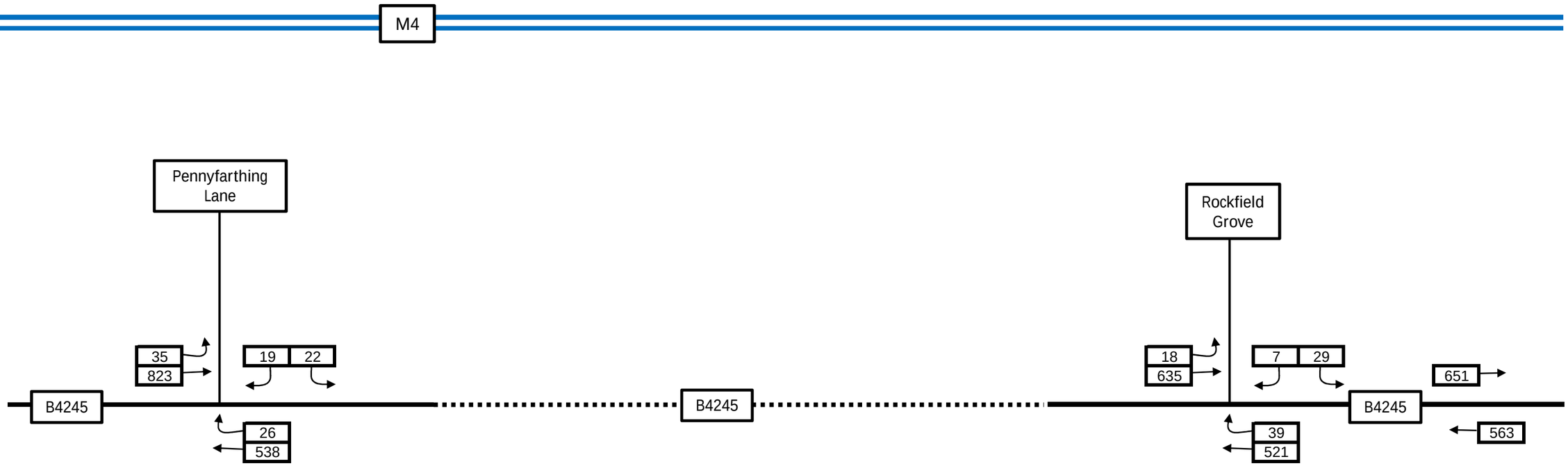
CLIENT
Monmouthshire County Council

PROJECT
Rockfield Farm Transport Assessment

DRAWING NUMBER 8 .1

DRAWING TITLE
2018 PM Peak Opening Year Base Flows (with Crick Road & Sudbrook Paper Mill Committed Developments)

PRODUCED	AS
CHECKED	SV
APPROVED	RJ



WSP | PARSONS BRINCKERHOFF

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DATE
01/06/2016

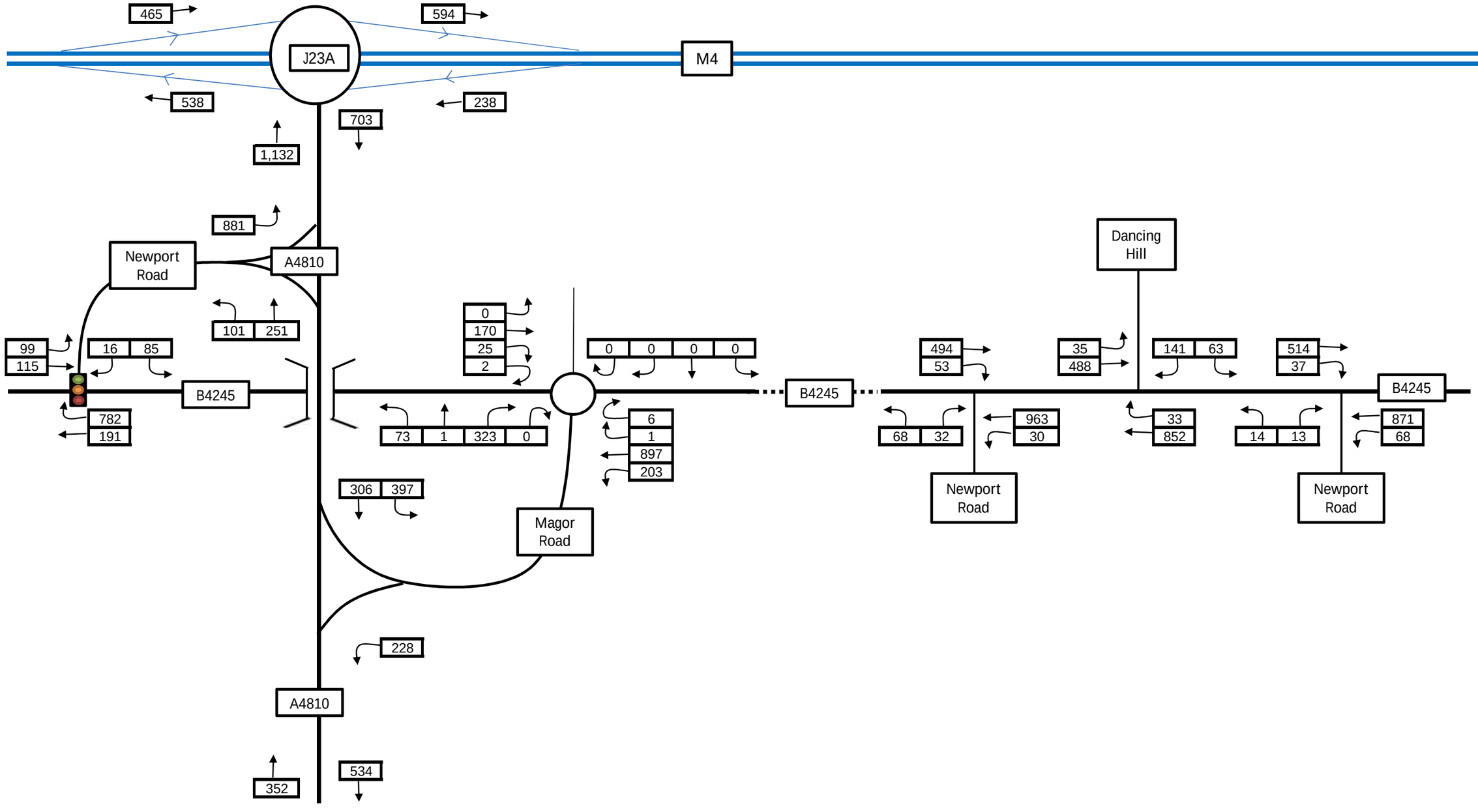
CLIENT
Monmouthshire County Council

PROJECT
Rockfield Farm Transport Assessment

DRAWING NUMBER 8 .2

DRAWING TITLE
2018 PM Peak Opening Year Base Flows (with Crick Road & Sudbrook Paper Mill Committed Developments)

PRODUCED	AS
CHECKED	SV
APPROVED	RJ



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DATE
01/06/2016

Option 144

CLIENT
Monmouthshire County Council

PROJECT
Rockfield Farm Transport Assessment

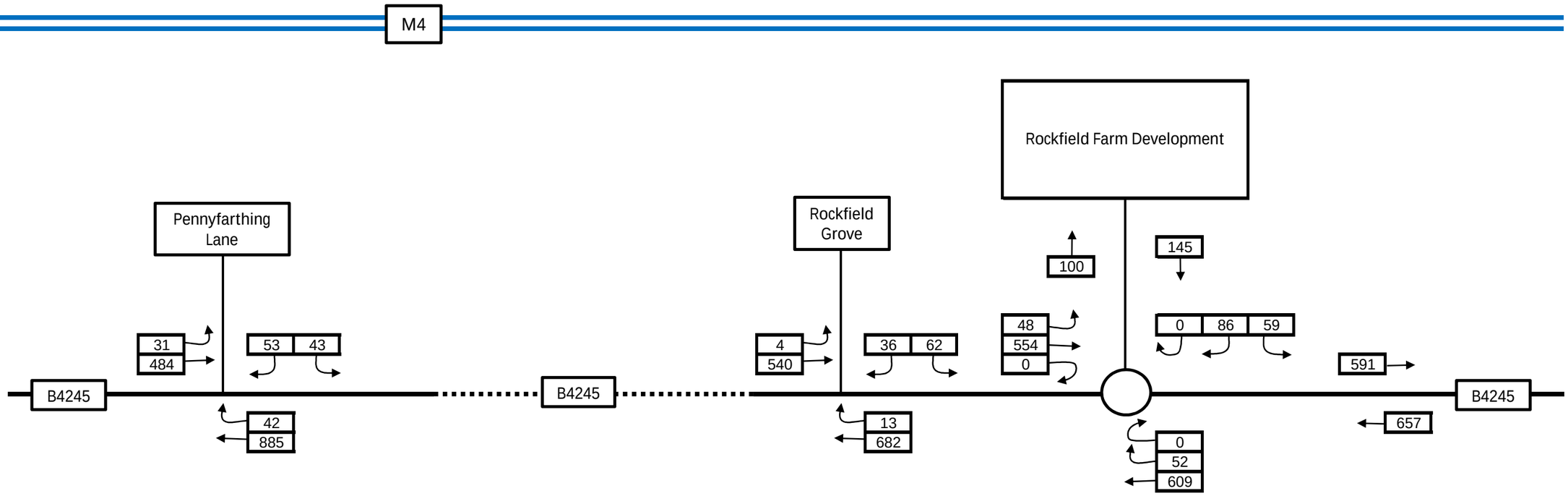
DRAWING NUMBER 9 .1

DRAWING TITLE
2018 AM Peak Opening Year Base + Development Flows (with Crick Road & Sudbrook Paper Mill and Rockfield Farm)

PRODUCED AS

CHECKED SV

APPROVED RJ



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Tel: (0)29 2076 9200

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PROJECT
Rockfield Farm Transport Assessment

DRAWING NUMBER 9 .2

DRAWING TITLE
2018 AM Peak Opening Year Base + Development Flows (with Crick Road & Sudbrook Paper Mill and Rockfield Farm)

PRODUCED AS

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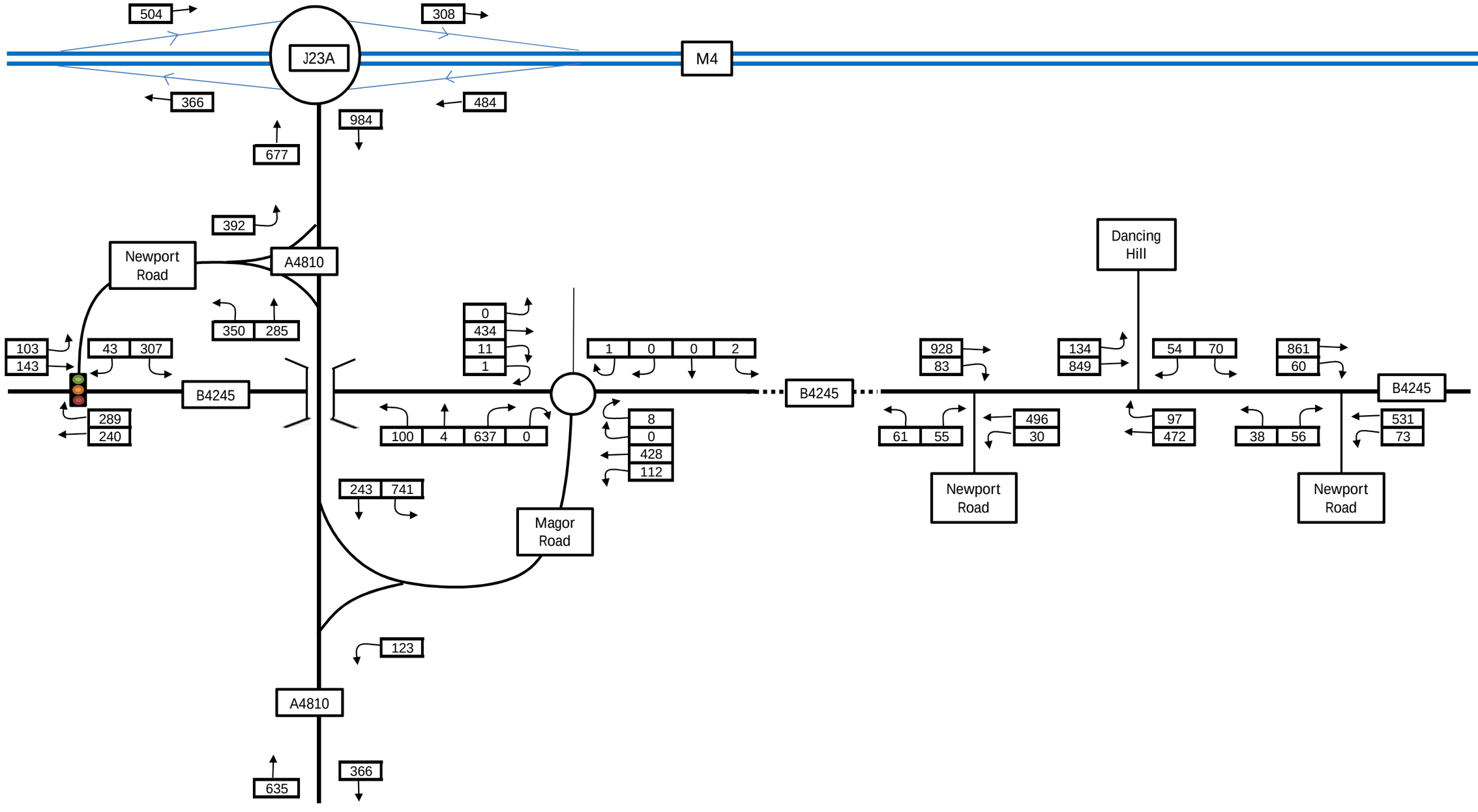

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Option 149

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PROJECT
Rockfield Farm Transport Assessment

DRAWING NUMBER 10 .1

DRAWING TITLE
2018 PM Peak Opening Year Base + Development Flows (with Crick Road & Sudbrook Paper Mill and Rockfield Farm)

PRODUCED	AS
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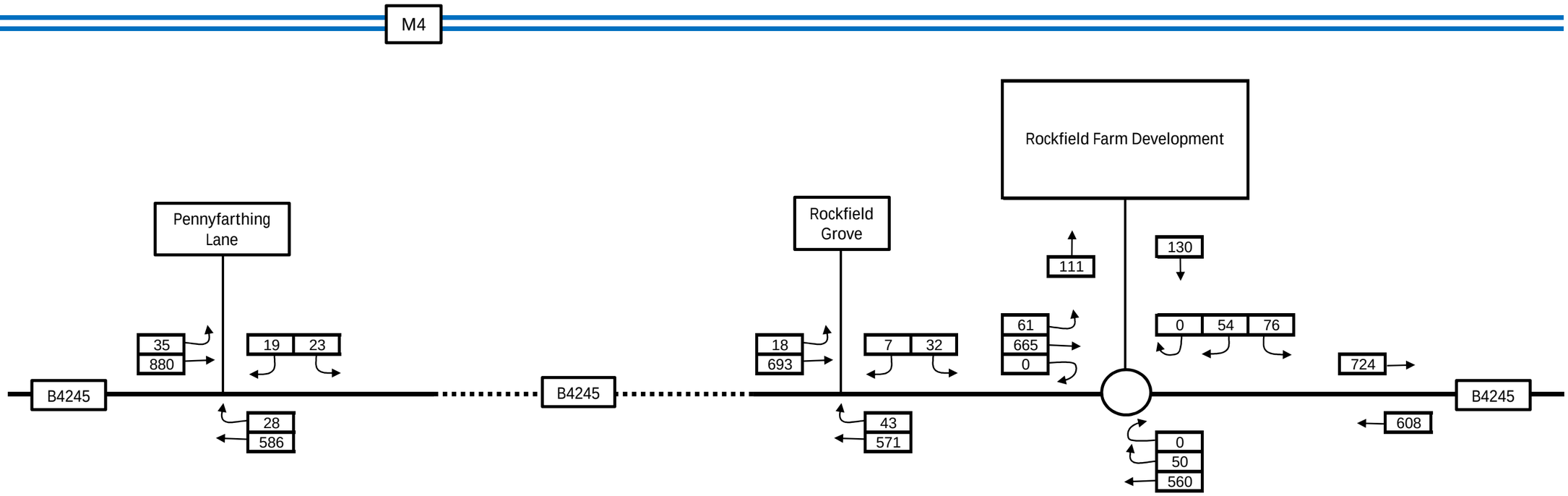
APPROVED	RJ



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PROJECT
Rockfield Farm Transport Assessment

DRAWING NUMBER 10 .2

DRAWING TITLE
2018 PM Peak Opening Year Base + Development Flows (with Crick Road & Sudbrook Paper Mill and Rockfield Farm)

PRODUCED AS

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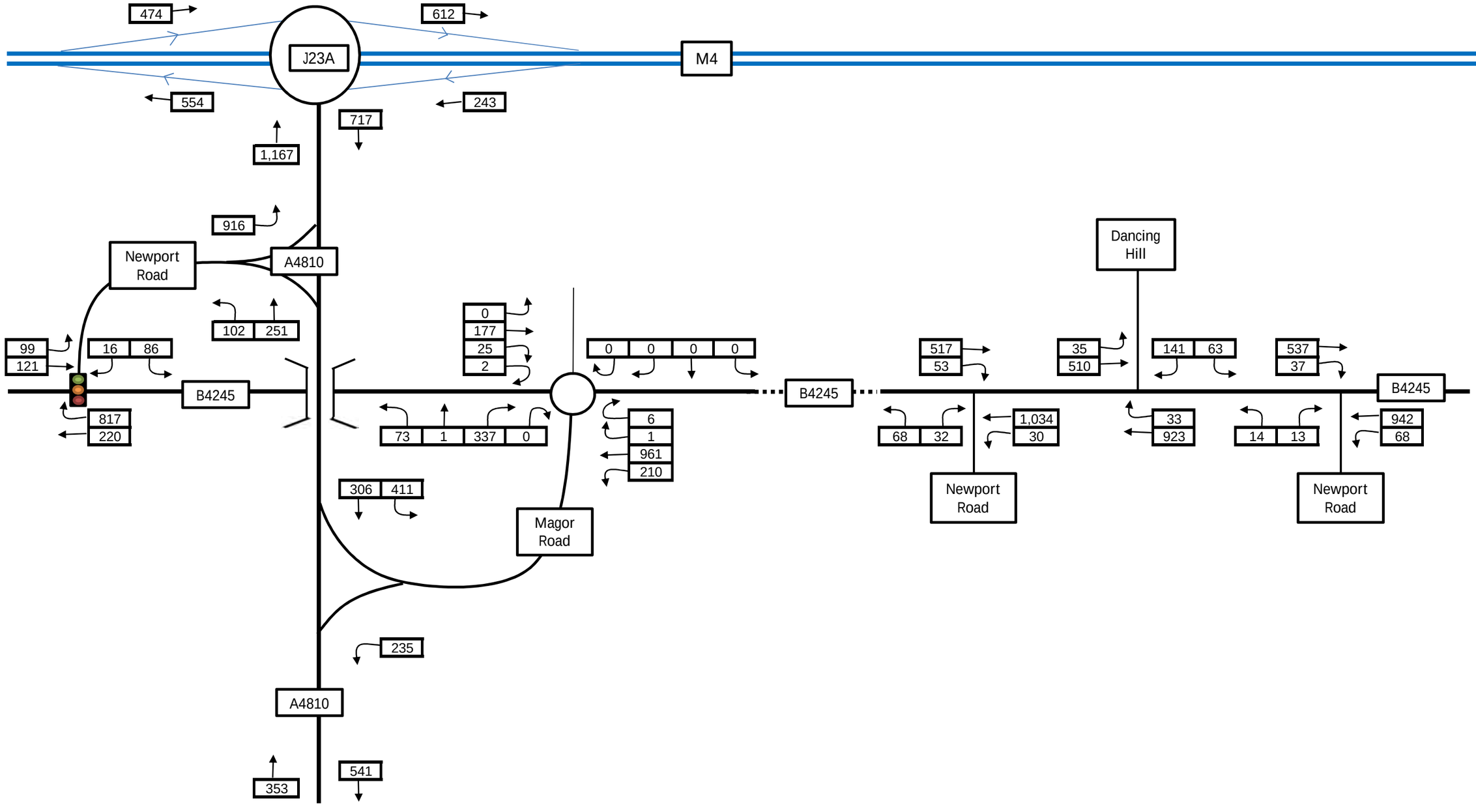

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Option 155

CLIENT
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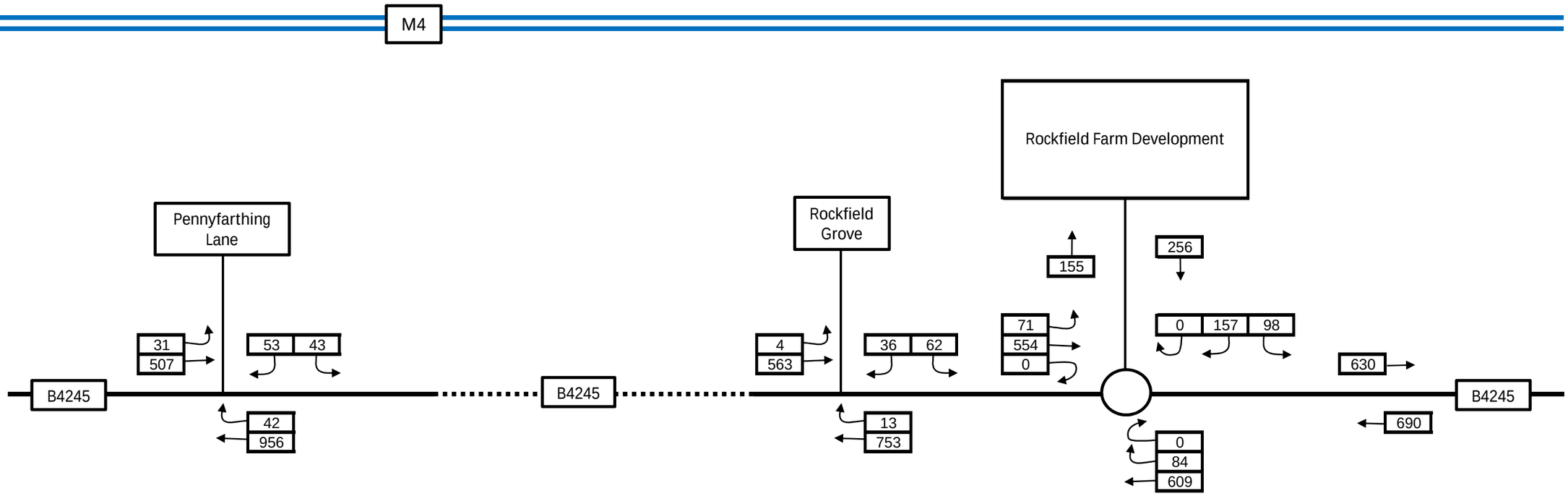
PROJECT
Rockfield Farm Transport Assessment

DRAWING NUMBER 11 .1

DRAWING TITLE
2018 AM Peak Opening Year Base + Development Sensitivity Test 1 Flows (with Crick Road & Sudbrook Paper Mill, Rockfield Farm and Vinegar Hill)

PRODUCED	AS
CHECKED	SV
APPROVED	RJ



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PROJECT
Rockfield Farm Transport Assessment

DRAWING NUMBER 11 .2

DRAWING TITLE
2018 AM Peak Opening Year Base + Development Sensitivity Test 1 Flows (with Crick Road & Sudbrook Paper Mill, Rockfield Farm and Vinegar Hill)

PRODUCED AS

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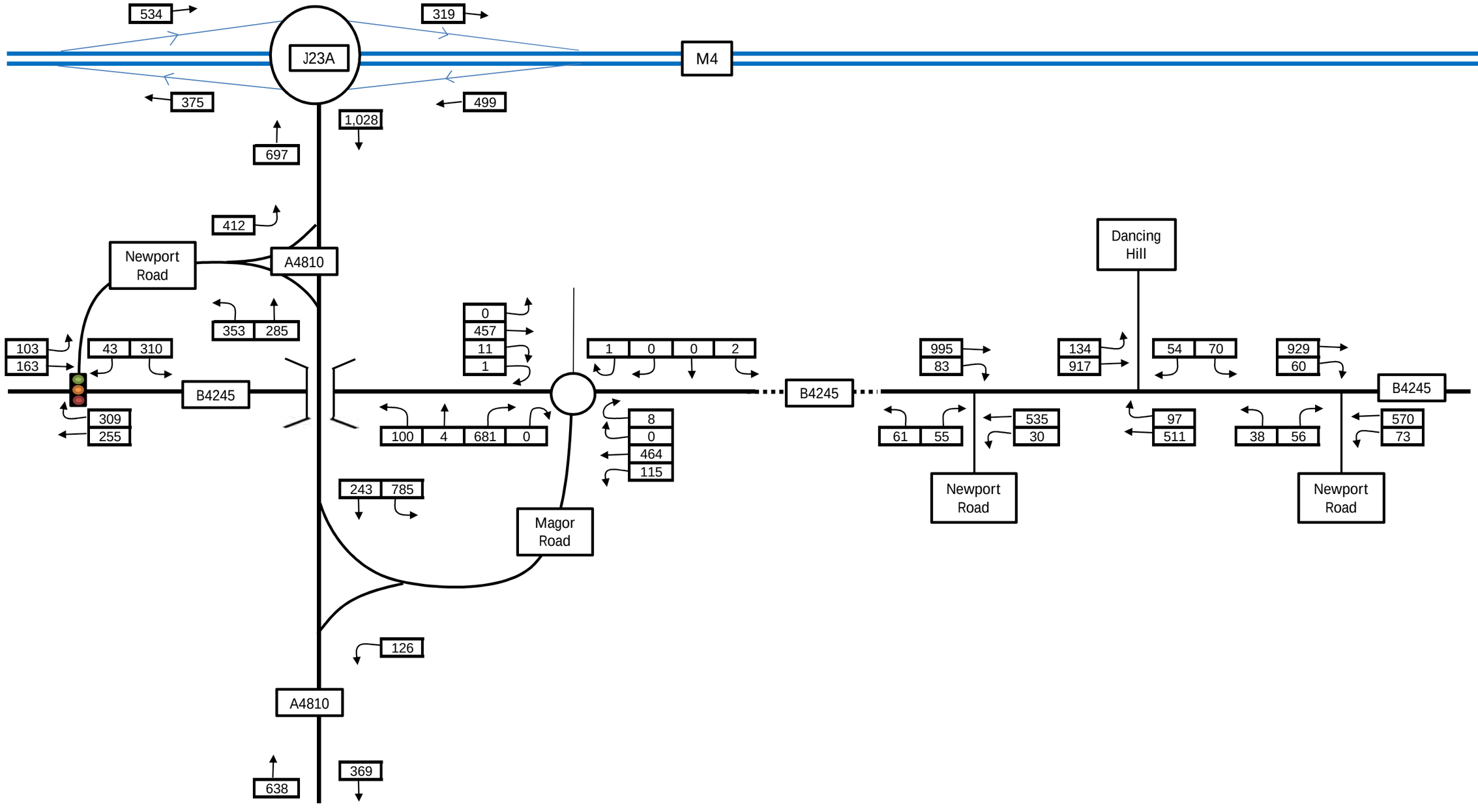

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Option 160

CLIENT
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PROJECT
Rockfield Farm Transport Assessment

DRAWING NUMBER 12 .1

DRAWING TITLE
2018 PM Peak Opening Year Base + Development Sensitivity Test 1 Flows (with Crick Road & Sudbrook Paper Mill, Rockfield Farm and Vinegar Hill)

PRODUCED AS

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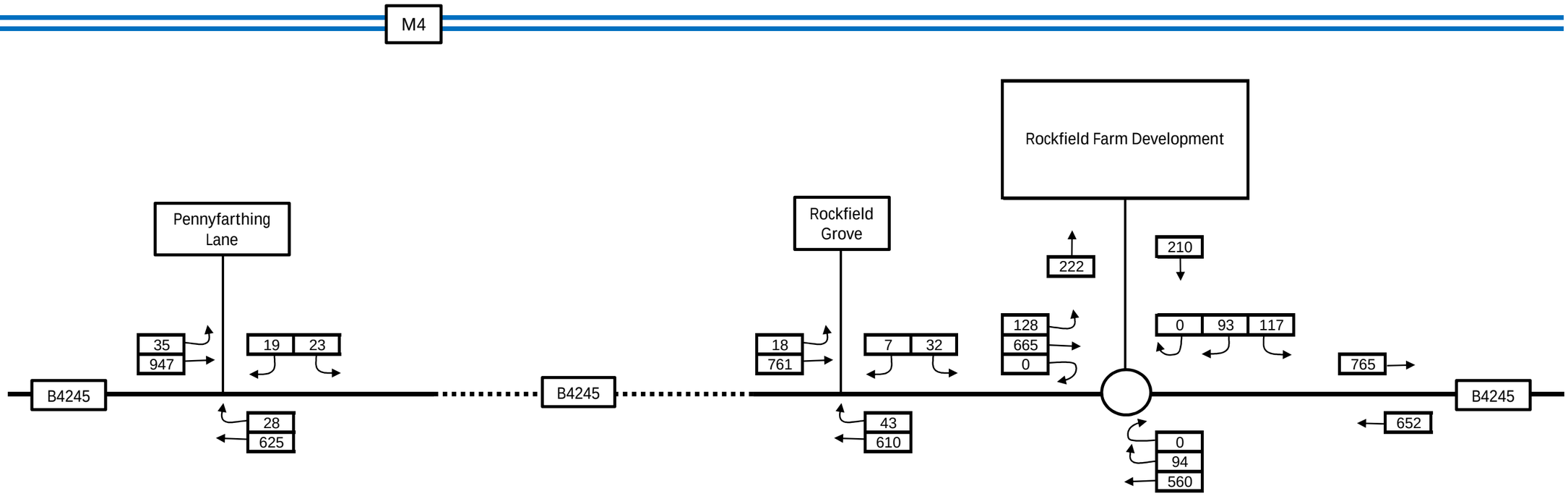
APPROVED RJ



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PROJECT
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DRAWING NUMBER 12 .2

DRAWING TITLE
2018 PM Peak Opening Year Base + Development Sensitivity Test 1 Flows (with Crick Road & Sudbrook Paper Mill, Rockfield Farm and Vinegar Hill)

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