ENVIRONMENTAL IMPACT ASSESSMENT SCREENING REPORT FOR PROPOSED NTA PARK AND RIDE DEVELOPMENT AT ASHFORD, CO. WICKLOW

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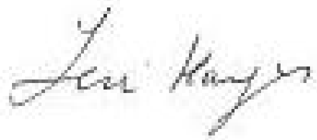
Signature		
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1.0 INTRODUCTION

On behalf of National Transport Authority (NTA) Park and Ride Development Office (PRDO) and Wicklow County Council, AWN Consulting Limited (AWN) has prepared the following Environmental Impact Assessment (EIA) Screening Report to accompany the planning application for a proposed Park and Ride facility development (the “Proposed Development”) located west of Junction-16 on N11, 1.3 km east of Ashford town, Co. Wicklow. The Proposed Development site is outlined in red on Figure 1.1 below.

The subject site is located in the northwest quadrant of Junction-16, immediately west of the M11 adjacent to the northbound on-ramp. It is bound by the R772 to the south, the M11 to the east and agricultural land to the west and north. It can be accessed from the R772. The site is privately owned and consists of an open field measuring approximately 2.47 hectares. The topography of the site is reasonably flat with minor / mild gradients and undulations.

A review of historical aerial imagery from 1995 indicates that the project site was previously greenfield and used for agricultural purposes, most likely as arable land. The 2004-2006 aerial imagery indicates the presence of M11 Motorway constructed to the east of the Site, while around 2013 a treeline is shown forming the eastern site boundary along the M11 slip roads to the east of the Site.

The proposed site is currently being used as agricultural land for livestock grazing and is occasionally used as a circus venue.

The River Vartry and the Conroe stream a tributary to the Rathnew Stream are the river / surface waterbodies in closest proximity to the site, which are located c.200m and c.175m to the north and south of the subject development, respectively. Both watercourses generally flow in an eastern directions before they outfall to the Broadstone Estuary, the Murrough Wetlands SAC and The Murrough SPA. The Broadstone Estuary ultimately discharges to the Irish sea at Wicklow Town Harbour.

“The proposed development comprises a car park with 210 parking spaces, including 13 designated for mobility-impaired users, 21 for electric vehicles, new bus standing area with a dedicated turning circle, 2 new bus bays and 2 passenger shelters, new set-down areas and taxi ranks with dedicated access, hardstanding area for bike shelter and lockers.

The proposal involves provision of hardstanding areas for bike shelters and lockers, active travel connections, fencing, kerbs, drainage, road markings, public lighting, CCTV, ticketing machines, and a new ESB substation (required to power the various electrical equipment within site) and switch room.

A new all-movement uncontrolled access junction is proposed at R772 to provide access to the facility that will feature a newly added right-turning pocket lane, achieved by widening the carriageway. A new 50m long and 3m wide right-turning lane will be built on R772 as part of the proposed junction by realigning the existing eastbound lane towards north to facilitate the local widening. Additionally, the entry to the existing eastern roundabout is proposed to be relocated towards the north to seamlessly integrate with the road alignment.

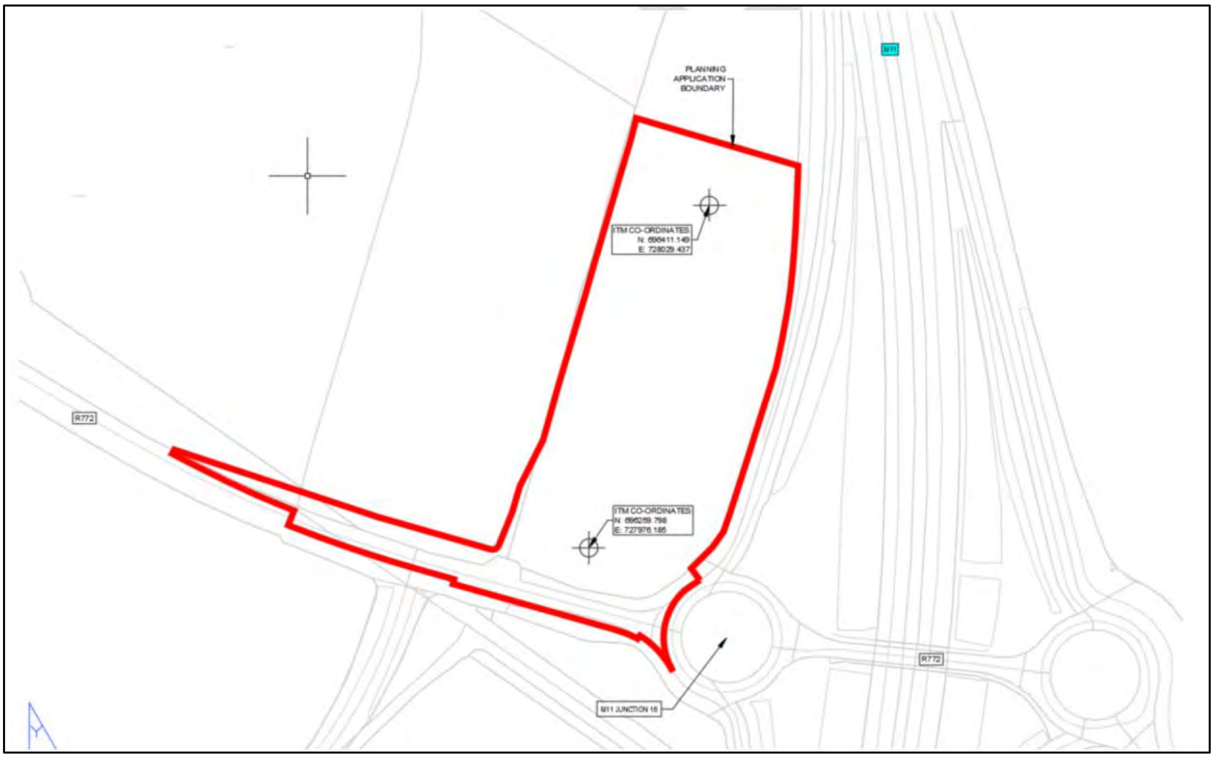


Figure 1.1 Proposed Development site boundary (in red)- site is located on the Northern side of the R772, off Junction 16 of the N11 (source: CSEA Planning Engineering Report M11-J16 (Ashford) Park and Ride, December 2023)

Figure 1.2 Proposed Development site (indicative site boundary in red)

Figure 1.3 Proposed Development site and regional context / surrounding land (site boundary indicated in red) (source: Google Earth Pro)

The purpose of this report is twofold, to provide Wicklow County Council with the information required under Schedule 7A to demonstrate the likely effects on the environment, having regard to the criteria set out in Schedule 7 of the Planning and Development Regulations 2001, as amended. This information will enable Wicklow County Council to undertake a screening determination in respect of the need for an Environmental Impact Assessment Report (EIAR) for the Proposed Development. The second reason for this report is to document the studies undertaken by the Applicant, and the design team, which demonstrate there are no significant effects predicted as a result of the Proposed Development and the application can be determined by Wicklow County Council without an EIAR having been submitted.

There is a mandatory requirement for an EIA Report to accompany a planning application for some types of development that meet or exceed the "thresholds'' as outlined in the Planning and Development Regulations 2001, as amended. In addition to the mandatory requirement, there is a case-by-case assessment necessary for sub-threshold developments as they may be likely to have significant effects on the environment. If a sub-threshold development is determined to be likely to have significant effect on the environment, then an EIA Report will be required. The requirements are discussed further in section 1.1 with the methodology outlined in section 1.2 below.

1.1 EIA SCREENING LEGISLATION AND GUIDANCE

The legislation and guidance listed below has informed this report and the EIA Screening methodology:

- European Union (Planning & Development) (Environmental Impact Assessment) Regulations 2018;
- Environmental Impact Assessment of Projects – Guidance on Screening. (2022). European Commission.
- Guidelines on the Information to be contained in Environmental Impact Assessment Reports. (2022). Environment Protection Agency.
- Environmental Impact Assessment of Projects - Guidance on the preparation of the Environmental Impact Assessment Report. (2022) European Commission.
- Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licensing Systems – Key Issues Consultation Paper (2017:DoHPCLG)
- Preparation of guidance documents for the implementation of EIA directive (Directive 2011/92/EU as amended by 2014/52/EU) – Annex I to the Final Report (COWI, Milieu; April 2017);
- European Union Environmental Impact Assessment (EIA) Directive 2011/92/EU as amended by 2014/52/EU
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment. (August 2018). Department of Housing, Planning and Local Government.
- Planning and Development Act, 2000 (as amended)
- Planning and Development Regulations 2001 (as amended)
- Interpretation of definitions of project categories of Annex I and II of the EIA Directive. (2015) European Commission
- Guidance for Consent Authorities regarding Sub-threshold Development (2003; DoEHLG).
- Office-of-the-Planning-Regulator (2021) Appropriate Assessment Screening for Development Management OPR Practice Note PN01. March 2021

The national requirements to provide an EIA with a planning application is outlined in *Planning and Development Act 2000 as amended* (the Act) and *Planning and Development Regulations, 2001 as amended* (the Regulations). In addition to the national legalisation there are requirements set out in the EU Directive (as referenced above); the EU Directive has been transposed into Irish Legislation.

There is a mandatory requirement for an EIA Report under Section 172(1)(a) of the Act to accompany a planning application for some types of projects which are equal to or exceeds a limit, quantity or “threshold” set for that class of development. The mandatory thresholds for an EIA Report are set out in Schedule 5 of the Regulations.

In addition to the mandatory requirement, there is a case-by-case assessment necessary for sub-threshold developments and a requirement under Section 172(1)(b) of the Act for an EIA to accompany a planning application for sub-threshold development which would be likely to have significant effects on the environment. In order to determine if a Project would be likely to have significant effects on the environment and if an EIA is required Schedule 7 of the Regulations sets out the relevant criteria to be considered by the Planning Authority.

Section 176A(2)(a) of the Act states that an application for screening for environmental impact assessment may be submitted to the Planning Authority. The scope of the information to be provided by the developer when an application for screening is made is set out in Section 176A(3) of the Act, Schedule 7A of the Regulations, and Annex IIA of the EU Directive.

The screening process followed in this report is in accordance with the EIA Directive 2011/92/EU of the European Parliament and of the Council as amended by 2014/52/EU and follows the format as per Section 3.2 of the EPA Guidelines (2022). The potential for significant effects of the proposed Project has been considered against Schedule 7 of the *Planning and Development Regulations, 2001 as amended*[1].

In producing this report due regard has been paid to other EIA guidance including the European Union's 2022 EIA *Guidance on Screening* and *Guidance on the preparation of the Environmental Impact Assessment Report* as well as the published *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessm*ent.

It is important for the Planning Authority to note that Article 27 of the EU Directive states that "*The screening procedure should ensure that an environmental impact assessment is only required for projects likely to have significant effects on the environment*". This screening exercise is used to establish whether the proposed Project is likely to have significant effects on the environment and if an EIA Report is required.

1.2 SCREENING METHODOLOGY

The key steps to screen for an EIA is set out in Section 3.2 of the EPA Guidelines (2022). This EIA Screening Report has been arranged to address the information as required by these steps. These steps are:

1. Is the development a type that that requires EIA?
2. Is it of a type that requires mandatory EIA?
3. Is it above the specified threshold?
4. Is it a type of project that could lead to effects? and/or
5. Is it a sensitive location? and/or
6. Could the effects be significant?

An assessment of the points 1 to 3 above has been made by AWN against the relevant legislation and thresholds set out in Schedule 5 of the Regulations, this evaluation has been documented in Section 2.0 of this report.

In order to address points 4 to 6 above, an evaluation of the characteristics of the project, the sensitivity of the location of the Proposed Development, and the potential for significant impacts has been made with regard to Schedule 7 of the Regulations. Schedule 7 of the Regulations sets out the criteria for the Planning Authority to determine whether a development would or would not be likely to have significant effects on the environment. The criteria is broadly set out under the three main headings:

- Characteristics of Proposed Development (Section 3.0)
- Location of Proposed Development (Section 4.0)
- Types and Characteristics of Potential Impacts (Section 5.0)

The Planning Authority must have regard to the Schedule 7 criteria in forming an opinion as to whether or not a development is likely to have significant effects on the environment by virtue, inter alia, of their nature, size or location should be subject to EIA.

The information required to be submitted by the developer for the Planning Authority to make a determination on EIA Screening is set out in Schedule 7A of the Regulation, Section 176A(2)(a) of the Act, and Annex IIA of the EU Directive.

However, it is important to note that Schedule 7A states '*The compilation of the information at paragraphs 1 to 3 [*of Schedule 7A*] shall take into account, where relevant, the criteria set out in Schedule 7*.' The main body of this report (Sections 3.0, 4.0 and 5.0) will cover Schedule 7A fully, but it has been set out to present the information under the headings provided for in Schedule 7 in order to assist the Planning Authority in its screening assessment.

1.3 CONTRIBUTORS TO THE EIA SCREENING REPORT

The preparation and co-ordination of this screening report has been completed by AWN Consulting in conjunction with the project design team and developer.

Table 1.1 Contributors to this Report

Role	Contributor
Developer	Wicklow County Council
Architectural	Clifton Scannell Emmerson Associates
Planning	Clifton Scannell Emmerson Associates
Civil, Mechanical and Electrical Engineering, Traffic and Transportation	Clifton Scannell Emerson Associates
Population and Human Health; Land Soils, Geology, Hydrogeology, and Hydrology; Air Quality and Climate; Noise and Vibration; Material Assets and Waste management	AWN Consulting Limited
Landscape and Visual Impact	Macro Works Ltd
Archaeology	Courtney Deery Archaeology and Cultural Heritage
Biodiversity including Appropriate Assessment Screening	Doherty Environmental Services

The various reports address a variety of environmental issues and assess the impact of the Proposed Development and demonstrate that, subject to implementation of the construction and design related mitigation measures recommended in this report, the Proposed Development will not have a significant impact on the environment. This EIA Screening Report should be read in conjunction with the plans and particulars submitted with the planning application.

2.0 SCREENING EVALUATION

2.1 IS THE DEVELOPMENT A PROJECT?

The first step in screening is to examine whether the proposal is a *project* as understood by the EU Directive. For the purposes of the EU Directive, 'project' means:

- the execution of construction works or of other installations or schemes, or
- other interventions in the natural surroundings and landscape including those involving the extraction of mineral resources.

The EPA Guidance (2022) states that if a proposed project is not of a type covered by the Directive, there is no statutory requirement for it to be subject to environmental impact assessment. In determining if the proposed project is of a type covered by the Directive it may be necessary to go beyond the general description of the project and to consider the component parts of the project and/or any processes arising from it.

If any such parts or processes are significant and, in their own right, fall within a class of development covered by the Directive, the proposed Project as a whole may fall within the requirements of the Directive.

Each element of the Proposed Development has been examined and the development clearly meets the definition of a Project as understood by the EU Directive.

2.2 IS THE DEVELOPMENT A PROJECT THAT REQUIRES A MANDATORY EIA?

The next step is to determine if the Proposed Development is of a project type that requires mandatory EIA; i.e. is the Proposed Development of a project type in which thresholds do not exist. The types of projects to which thresholds do not apply are types that are considered to always be likely to have significant effects.

Ireland's type of projects for which an EIA is mandatory is set out in the Schedule 5 Part 1 and Part 2 of the Regulations. An EIA is deemed mandatory under Section 172 of the Act to accompany a planning application for development for the types of projects set out in Schedule 5. This list was developed from Annex I and Annex II of the EIA Directive.

There is no specific project type listed under Schedule 5, Part 1 or Part 2 of the Regulations for the Proposed Development.

In considering the wider context and the component parts of the project the Proposed Development would most appropriately fall under the project type *Schedule 5, Part 2, Class 10 Infrastructure Projects*. Class 10 is of a type that sets out project thresholds; therefore, the next screening step is to determine whether the project exceeds the specific project threshold.

2.3 IS THE PROJECT ABOVE THE THRESHOLD FOR EIA?

An EIAR is required to accompany an application for permission of a class set out in the Schedule 5 Part 1 and Part 2 of the Regulations which equals or exceeds, as the case may be, a limit, quantity or threshold set for that class of development. A development that does not exceed a limit, quantity or threshold set for that class of development in Schedule 5 of the Regulations is known as a 'sub-threshold development'.

The Proposed Development and component parts have been considered against the thresholds outlined in Schedule 5, Part 2 Class 10 (a) to (m). The most relevant project type in the context of the Proposed Development is Class 10 (b):

10. Infrastructure projects

(b) (ii) Construction of a car-park providing more than 400 spaces, other than a car-park provided as part of, and incidental to the primary purpose of, a development.

The Proposed Development site is a carpark with 210 car parking spaces, including 13 no. mobility impaired parking spaces and 21 no. e-car charging spaces. The Proposed Development site is not equal to nor does it exceed the limit, quantity or threshold set out in Class 10 (b); therefore, an EIA is not mandatory.

In addition the development does not entail an extension or change to any existing EIA project (i.e. Class 13).

2.4 CONCLUSION – SUB THRESHOLD DEVELOPMENT

The Proposed Development is '*of a type set out in Part 2 of Schedule 5 [in the Planning and Development Regulations, 2001 (as amended)] which does not equal or exceed, as the case may be, a quantity, area or other limit specified in that Schedule in respect of the relevant class of development*'. The development is outside the mandatory requirements for EIA, and is considered to be sub-threshold for the relevant project type.

An EIA Report is still required by Section 172 of the Act to accompany a planning application for sub-threshold development which would be likely to have significant effects on the environment, having regard to the criteria set out in Schedule 7.

However, where a Proposed Development is a sub-threshold development, the Applicant may make an application for a screening determination for EIA to the planning authority in whose area the development would be situated, under section 176A(2)(a) of the Act. Therefore, the final step in the screening process is to consider the need for an EIA on a discretionary basis.

Article 4(4) of Directive 2014/52/EU requires the developer to provide information on the characteristics of the project and its likely significant effects on the environment, to allow the competent authorities to make a determination on the requirement for an EIA.

The remainder of this report is to form the basis of the application made for sub-threshold screening for EIA under Section 176A(2)(a) and presents the information required by Schedule 7A to demonstrate the likely effects on the environment, having regard to the criteria set out in Schedule 7. The following Sections 3.0, 4.0 and 5.0 will provide information on the characteristics of the Proposed Development; the location and context, and its likely impact on the environment as well as a description of any features of the project and/or measures envisaged to avoid or prevent what might otherwise have been significant adverse effects on the environment. These sections present the information required under Schedule 7A of the Regulations, broadly set out in the structure Schedule 7 to ensure that each aspect for consideration is robustly addressed.

3.0 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

This section addresses the characteristics of the Proposed Development by describing the development in detail. This is to identify all areas of potential issues to explore further and assess for impacts.

3.1 SIZE AND DESIGN OF THE PROPOSED DEVELOPMENT

This EIA Screening Report should be read in conjunction with the plans and particulars submitted with the planning application. The overall site area is 2.47 ha.

The Proposed Development is presented in Figure 3.1 below.

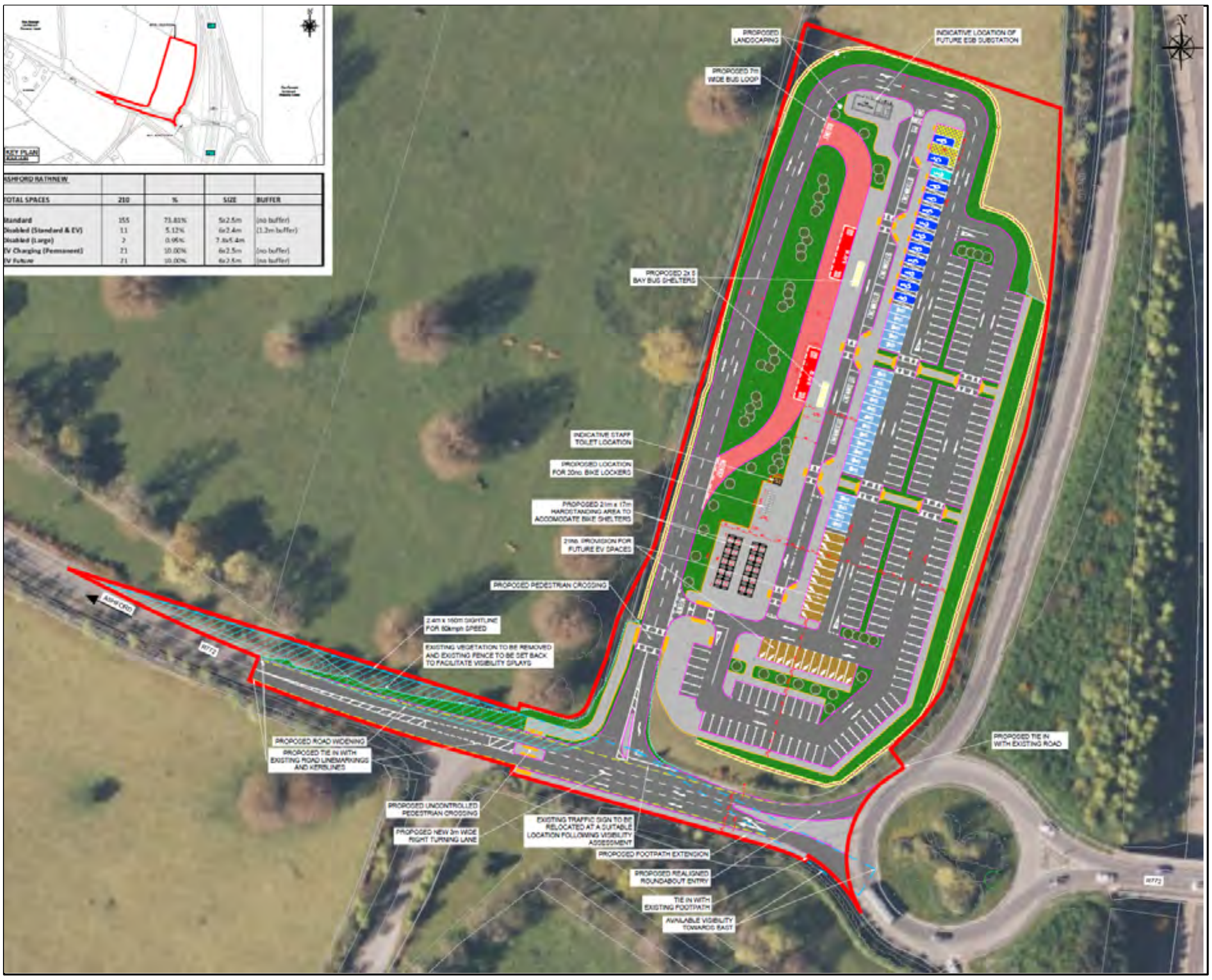


Figure 3.1 Proposed Development Layout (Source: CSEA, Drawing Ref:20_008L-CSE-GEN-XX-DR-C-2200)

The Proposed Development, comprises the development of a Park and Ride Facility to include;

- A new car parking area capable of accommodating a total of 210 car parking spaces,
- Including 13 no. mobility impaired parking spaces and 21 no. e-car charging spaces.
- Construction of internal road network and circulation areas.
- New bus standing area with a dedicated turning circle,
- 2 new bus bays and 2 passenger shelters.
- New set-down areas and taxi ranks with dedicated access.
- Hardstanding area for bike shelter and lockers (20 no. bicycle parking Sheffield stands, and 20 no. bike lockers).
- Construction of access arrangement
- Hard and soft landscaping and planting, lighting, boundary treatments, and all associated and ancillary works including underground storm water drainage network, and utility cables.
- Construction of a substation and switch room.

This screening assessment considers the construction, operation and decommissioning of the Proposed Development.

The landscape design was developed to maximise the opportunity for green infrastructure and biodiversity to the local environment and surrounding context of the site. The majority of the existing mixed hedgerow vegetation and mature tree lines which bound the site to the west and east are to be retained, with the exception of the existing hedgerow (first 65meter from south) located immediately west of the proposed site access junction, which will be impacted by the development. Overall, the proposed development is considered relatively modest in terms of its scale and nature, and is located within the existing agricultural land holding, which will be enhanced as part of the landscape mitigation strategy, which encompasses an array of native and pollinator friendly plantings. The proposed development is also considered a characteristic addition to the immediate landscape context, which is already heavily influenced by national and regional road networks.

The design includes the planting of avenues with a mix of native whips and advanced nursery stock and pockets of pollinator friendly shrubs, wildflower meadows and other planting located throughout the site.

The proposed development site is contained in the landscape character unit ‘Corridor Area – The N11’. This landscape unit is described as an area that *“covers the main access corridor area along the east of the County. The boundary of the eastern access corridor generally follows what is considered to be the areas upon which the greatest influence is exerted by this primary access route.*

It is worth noting that the proposed development is bounded by the landscape unit ‘Urban Areas’ to the east and west, which are associated with the settlements of Ashford and Rathnew. In terms of landscape classification ‘Urban Areas’ *“have already been deemed suitable for development (of the type allowed by the settlement strategy and the development standards of this plan) and the impacts on the wider landscape of such development has already been deemed acceptable. Therefore it will not be necessary for developments in urban areas to have regard to the surrounding landscape classification or to carry out landscape or visual impact assessment”* (Macroworks, 2023)

As per the current Wicklow County Development Plan (2022-2028), the Proposed Development site occupies un-zoned land whereby designated land use zoning is not in effect. It is projected that there will be a substantial increase in public transport demand between 2021 and 2042 with significant population increases forecasted along the corridor and planned road capacity improvements of the M11. The demand for Park & Ride will further increase as the public transportation mode share increases to accommodate the expected increase in trips to 2042.

Currently there is insufficient capacity along a section of this route between the Glen of the Downs (i.e., just north of Junction 7) and Dublin City to cater for existing demand during peak periods. Thus, the N11/M11 is subject to heavy congestion during these times. Most trips using the N11/M11 corridor during peak times are taken by single occupancy car commuters. These road users occupy a high proportion of road space per person compared with the equivalent space occupied per person travelling on Public Transport. Therefore, the transfer of a proportion of these single occupancy car trips onto public transport by intercepting car trips where people are reliant on a private car at an early viable point in their journey thereby reducing the distances travelled by private cars with a **corresponding reduction in carbon emissions** and congestion along this corridor. Reduce reliance on the private car, reduce distances travelled by car and ensure Park and Ride facilitates greater use of sustainable modes. Thus, given the sites location, its good quality road / bike pedestrian access and connectivity to / from the motorway via the interchange, it is considered that the proposed Park and

Ride facility is an appropriate land use within this land use zoning. The objective through the design is to protect and enhance the existing landscape.

The Landscape Design Rationale prepared by Macroworks describes the landscape design, which forms an integral part of the overall design. The Landscape and Visual Assessment conducted by Macro Works Ltd indicates that the landscape sensitivity in the vicinity of the site is varied. The proposed development site is located in an area of classified with a 'Low Sensitivity', whilst some localised parts of the immediate surrounding landscape are classified with a 'Medium-High' sensitivity classification, which principally relates to local rivers and streams such as the River Vartry to the north of the site. In the wider surrounds of the site, the landscape to the east is generally classified with a 'Low' sensitivity as it is principally characterised by typical rural farmland and urban area. Whereas, a notable area of 'High' sensitivity occurs in the wider landscape to the east of the site and relates to the landscape unit 'Coastal Area (Area of Natural Beauty). The Proposed Development is considered relatively modest in terms of its scale and nature, is discretely located and is a characteristic addition to the landscape in the immediate surrounds / vicinity of the site.

According to Landscape and Visual Impact Assessment (LVIA) prepared by Macro Works (2023), the development will not encroach on this area which is characterized by a robust and heavily modified landscape context that is notably influenced by the existing M11 motorway corridor, and instead will seek to protect and enhance the appearance of the area. The proposed park and ride facility is considered an appropriately site development that will only have a modest physical impact on the receiving landscape. Impacts on the local landscape character will be limited to the immediate surrounds of the site due to the high degree of intervening vegetation that occurs in the immediate surrounds of the site, which limits any clear visibility of the proposed development to a brief section of the R772 regional road corridor south of the site. Furthermore, this is not considered a highly rare of distinctive landscape setting, which is further reinforced by the 'Low' landscape sensitivity that contains much of the site and surrounding local landscape context.

In order to facilitate the proposed park and ride facility there will be a requirement to complete cut and fill works. Whilst every effort has been made to reduce the need for large areas of cut and fill, there will be some areas of soil stripping to accommodate the proposed access junction, internal roads, parking bays and footpaths.

There will be a requirement for the removal of c. 6,231 m^3 of topsoil from site and importation of 21,824 m^3 of material to facilitate the proposed development

There will also be physical disturbance of soil/subsoil to accommodate the foundations of the proposed structures, such as the proposed bus shelters, bicycle shelters, charging points and lighting poles. Overall, the physical impacts of the Proposed Development on the receiving landscape will be relatively modest and limited to the immediate surrounds of the site due to the high degree of intervening vegetation that occurs in the immediate surrounds of the site.

There will be temporary construction stage landscape impacts relating to the excavation of materials, temporary storage of such materials and other building materials, and the occasional movement of construction machinery.

The various reports prepared by the specialist consultants are included in Appendices A – H and the design team members are outlined within Section 1.3. These reports describe particular aspects of the scheme in further detail, and form part of the overall application.

There are limited buildings and above ground structures associated with the Proposed Development. The architectural design of the Proposed Development included for bus shelters, bike shelters and an electricity substation. These structures will have low visual impact due the limited height and extent of the structures and will be discretely located on the site.

Full details on the stormwater strategy are provided in the Engineering Planning Report provided with planning.

There are some existing utility ducts and pipes such as a medium pressure gas distribution main, existing surface water drainage pipes and a few unknown ducts (possibly public lighting ducts) are present within the redline boundary of the scheme on R772 immediately south of the site. However, after conducting the initial investigation, it has been determined that the proposed development and associated construction activities will not have any significant impact on these existing utilities.

The Proposed Development's surface water drainage system was designed in accordance with the Greater Dublin Strategic Drainage Strategy (GDSDS) and consists of the following system. To comply with the GDSDS guidelines in relation to SUDs, permeable asphalt is proposed in all parking bay areas, including the aisles, to promote infiltration of the storm water into the ground. At locations such as the access road and bus turning area where nonpermeable surfacing is proposed, a series of gullies will convey the runoff to either the raingardens or permeable asphalt areas for infiltration.

Figure 3.2 Proposed Development Drainage Layout (Source: CSEA, Drawing ref: 20_008L-CSE-GEN-XX-DR-C-2510)

There will be no stormwater discharge to the public stormwater system and the welfare facilities on site which will treated via a wastewater treatment system (Puraflo or similar), as there are no existing foul sewers in the vicinity of the site. There is a requirement for a water connection for the site to service the welfare facilities.

The utility connections for the subject development are as follows:

- Water demand will be met from public supply. A pre-connection enquiry (PCE) was submitted to Uisce Éireann on 31st May 2024 for potable water, including fire flow requirements (ref CDS24004707).
- An electrical connection will be established at the development following consultation with ESB Networks. A notification application has been made to ESB Networks with respect to the proposed development (Notification Number 5000487586).
- A medium pressure gas distribution main, existing surface water drainage pipes and a few unknown ducts (possibly public lighting ducts) are present within the redline boundary of the scheme on R772 immediately south of the site. However, it has been determined that the proposed development and associated construction activities will not have any significant or major impact on these existing utilities.
- A new substation will be required to power the various electrical equipment within site. It is proposed that this future ESB substation will be located in the

northern portion of the site. However, the exact location will be finalised following further consultation with ESB Networks.

3.2 CUMULATION WITH OTHER EXISTING OR PERMITTED DEVELOPMENT

This section outlines the potential cumulation with other existing or permitted development. As part of the assessment of the impact of the Proposed Development, account has been taken of any relevant developments that are currently permitted, or under construction and substantial projects for which planning has been submitted within the surrounding areas, as well as existing local land uses.

As per the current Wicklow County Development Plan (2022-2028), the Proposed Development site occupies unzoned land whereby designated land use zoning is not in effect (refer to Figure 3.3 and Figure 3.4 below).

As outlined in the Planning Engineering Report prepared by Clifton Scannell Emerson and the Park and Ride Development Office which accompanies the planning application, the Proposed Development complies with the Wicklow County Development Plan 2022 – 2028, in particular, the following policy:

"CPO 11.29: To support tourist/visitor park and ride facilities at appropriate locations that will facilitate access to upland amenity areas as may be identified in the Glendalough and Wicklow Mountains National Park Masterplan, or by strategies / plans of the Wicklow Outdoor Recreation Committee, Wicklow Tourism or other tourism agencies."

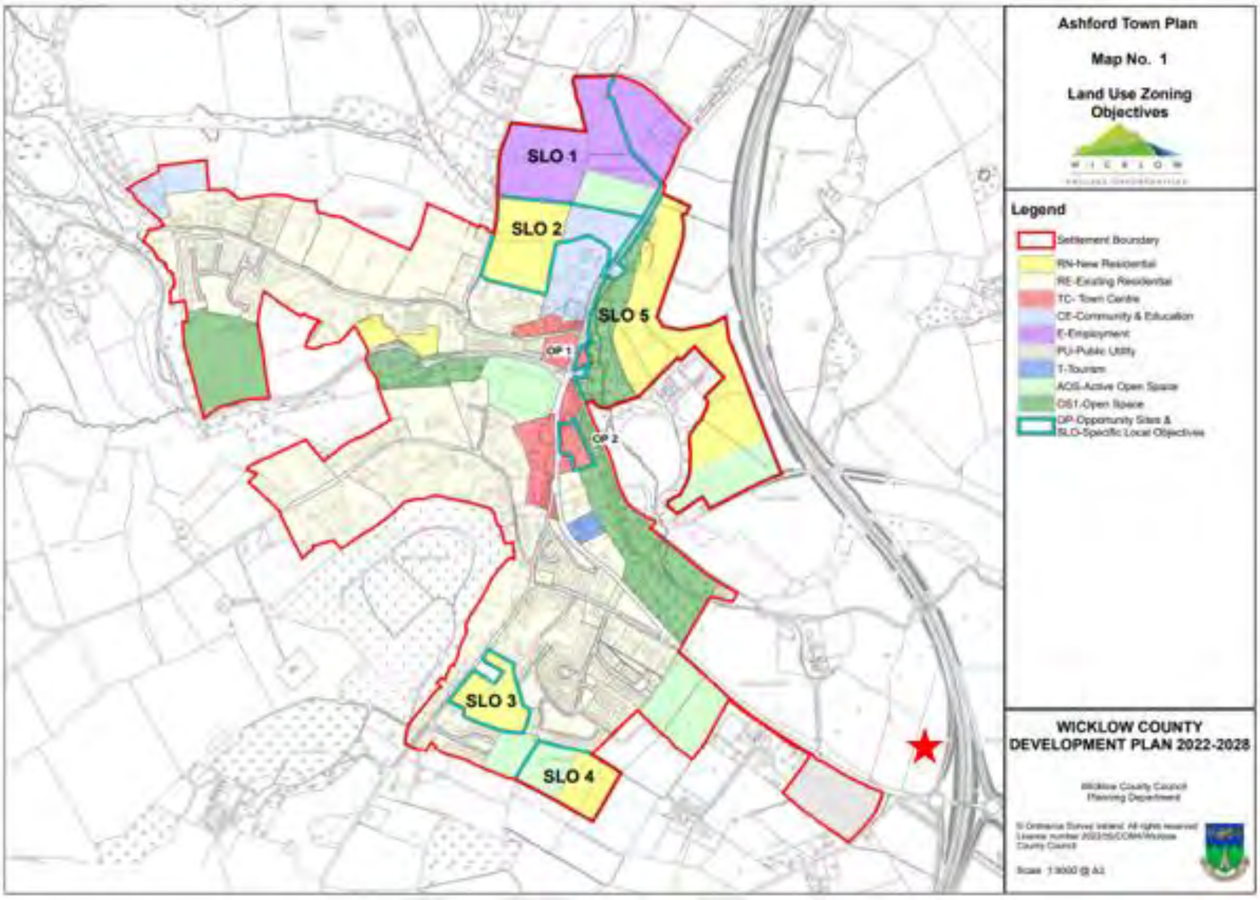


Figure 3.3 Site Zoning, approximate site location indicated by red star (Source: WCC Development Plan 2022-2028)

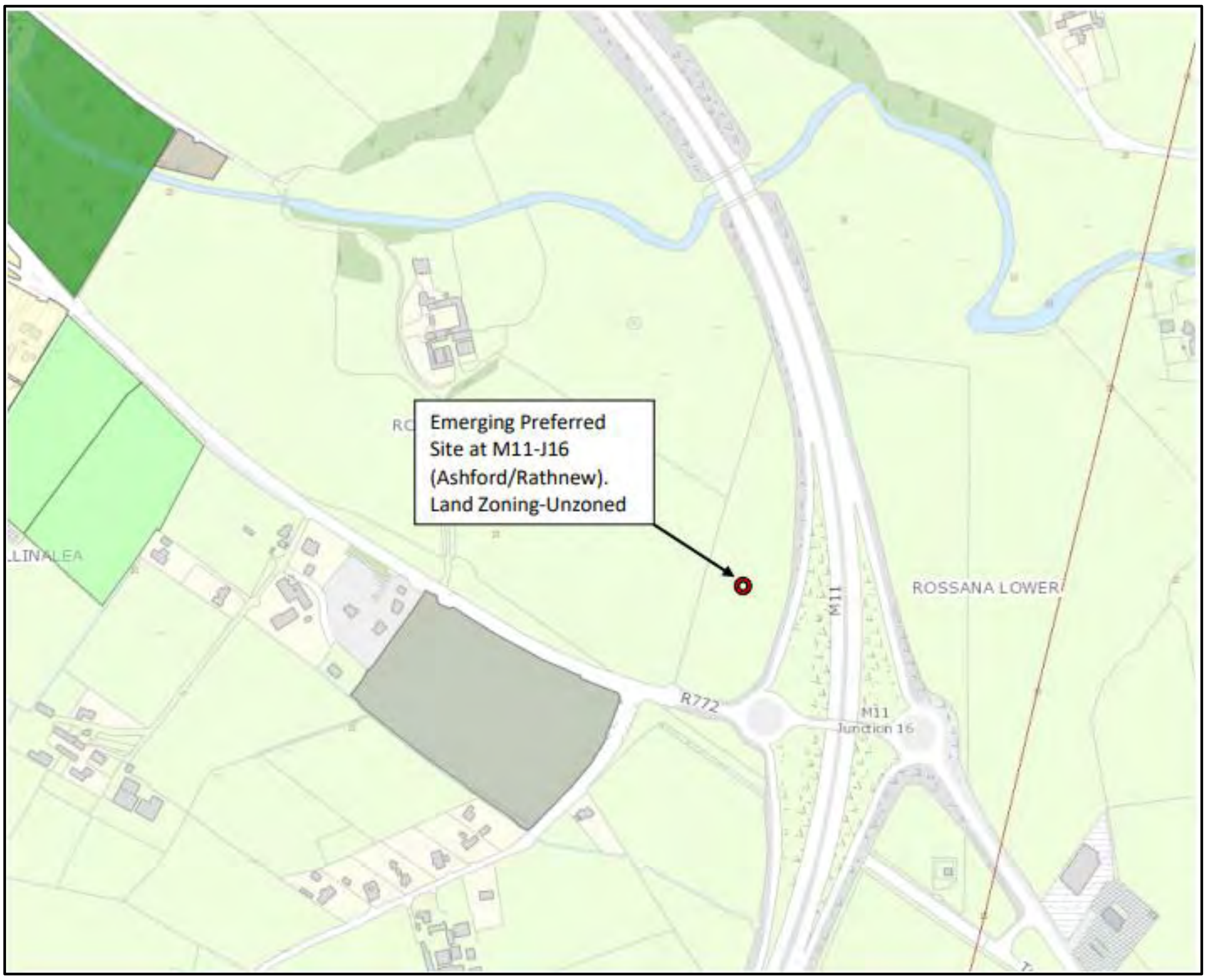


Figure 3.4 Site Zoning, approximate site location

The Landscape and Visual Assessment conducted by Macro Works Ltd indicates that the landscape sensitivity in the vicinity of the site is varied. The proposed development site is located in an area of classified with a 'Low Sensitivity', whilst some localised parts of the immediate surrounding landscape are classified with a 'Medium-High' sensitivity classification, which principally relates to local rivers and streams such as the River Vartry to the north of the site. In the wider surrounds of the site, the landscape to the east is generally classified with a 'Low' sensitivity as it is principally characterised by typical rural farmland and urban area. Whereas, a notable area of 'High' sensitivity occurs in the wider landscape to the east of the site and relates to the landscape unit 'Coastal Area (Area of Natural Beauty). The Proposed Development is considered relatively modest in terms of its scale and nature, is discretely located and is a characteristic addition to the landscape in the immediate surrounds / vicinity of the site.

The proposed development is bounded by the landscape unit 'Urban Areas' to the east and west, which are associated with the settlements of Ashford and Rathnew. In terms of landscape classification 'Urban Areas' *"have already been deemed suitable for development (of the type allowed by the settlement strategy and the development standards of this plan) and the impacts on the wider landscape of such development has already been deemed acceptable. Therefore it will not be necessary for developments in urban areas to have regard to the surrounding landscape classification or to carry out landscape or visual impact assessment."*

The Wicklow County Council online planning search systems were consulted to generate a list of applications granted permission within the previous 5 years. Appendix A documents the relevant planning history within the vicinity (2 km) of the subject site.

It is important to note that each project shown which has been permitted is subject to an EIA and/or planning conditions which include appropriate mitigation measures to minimise environmental impacts. Any new large-scale development proposed in the surrounding area would be accompanied by an EIA, or EIA Screening as appropriate and the mitigation plan taken into consideration in the development of this site.

Each environmental discipline who has contributed to this report has considered relevant permitted or proposed projects and assessed the potential for cumulative impact due to these projects. This is further discussed in section 5.10.

3.3 NATURE OF ANY ASSOCIATED DEMOLITION WORKS

There are no existing structures onsite that require demolition.

3.4 USE OF NATURAL RESOURCES (LAND, SOIL, WATER, BIODIVERSITY)

This section describes the Proposed Development in terms of the use of natural resources, in particular land, soil, water, biodiversity. The Proposed Development will consume minimal amounts of natural resources during construction and operation.

Land and Soil

The GSI mapping database (GSI, 2024) was consulted in order to determine and classify the ground composition at the site. The GIS shows that the subject development site is entirely underlain by Irish Sea Till surface / ground water Gleys (AminPD) which is classified as being a mineral poorly drained (mainly acidic) soil derived from mainly non-calcareous parent materials such as sandstone and shale till (cambrian / Precambrian). Irish sea till is the predominant / primary soil type in the vicinity of the site, while the wider surrounding area is characterized by localized zones of Alluvium associated with Vartry River and Cronroe Stream to the north and south of the site, respectively. The nearby settlement townlands of Ashford and Rathnew are largely underlain by Made Ground deposits (refer to Figure 3.5 below).

Figure 3.5 Soils Map (site boundary indicated by redline) (Source: GSI, 2024)

The GSI (2024) mapping database of the quaternary sediments (subsoils) in the study area indicates that the subsoil type beneath the subject site comprise Irish Sea Till derived from Cambrian sandstones and shales (refer to Figure 3.6 below).

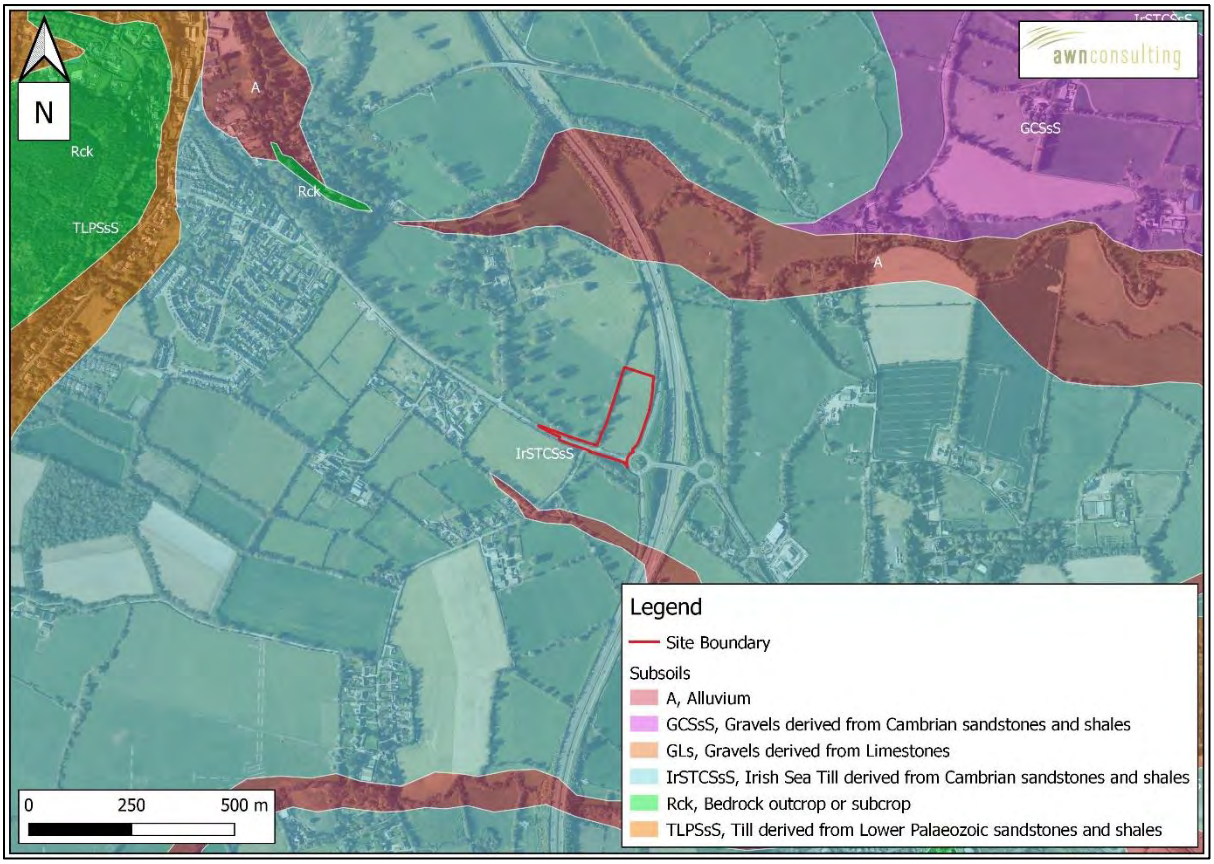


Figure 3.6 Quaternary Subsoils Map (site boundary indicated by redline) (Source: GSI, 2024)

Inspection of the available GSI (2024) records (on-line mapping database) shows that the bedrock geology of the site and the surrounding wider vicinity / area is dominated by the Maulin Formation (Rock Code: OTMAUL), identified as Dark blue-grey slate, phyllite and schist from the Ordovician system/period, presented as a massive Dark blue-grey slates and phyllites striped with pale siltstone. The development site is overlying a fault line which traverses the central portion of the site, characterized by a northwest to southeast orientation. Please refer to Figure 3.7 below.

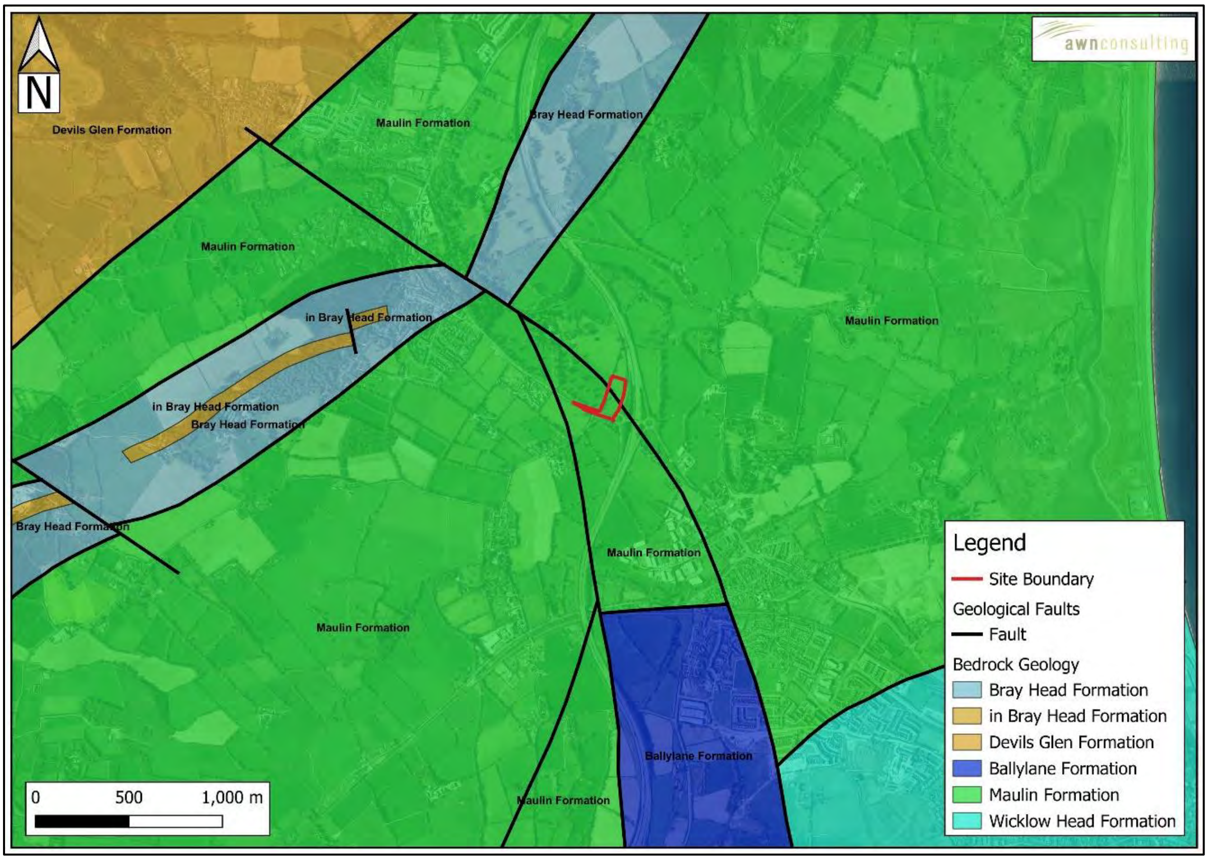


Figure 3.7 Bedrock Geology Map (site boundary indicated by redline) (Source: GSI, 2024)

The Proposed Development which is currently a greenfield site characterized by a previous / historic agricultural function and is situated at a small agricultural (greenfield) land holding immediately northeast of the Junction 16 of the M11 motorway corridor, adjacent to (east) the outskirts of the settlement at Ashford town.

Whilst the predominant land use within the study area is agricultural farmland bound by mixed hedgerow vegetation and mature tree lines, the study area also encompasses an array of anthropogenic land uses associated with the settlements of Ashford, Rathnew and Wicklow Town. The M11 motorway corridor is situated immediately east of the site and is typically bound by sections of dense mature vegetation. The site is also bound by a demesne landscape to the west, which comprises Rossana House. The settlements of Rathnew and Ashford are both situated within the near vicinity of the site. The outskirts of both Rathnew and Ashford are located less than c. 1km to the southeast and west of the site, respectively. The larger settlement of Wicklow town is also located within the wider study area, the outskirts of which are located just over 2.5km southeast of the site. In terms of local settlement pattern in the site's immediate vicinity, the nearest dwellings to the proposed development are located along a local road some c. 150m south of the site. A cluster of residential dwellings is also located along this local road corridor further to the south again, whilst a residential cluster is also located along the R772 regional road some c. 275m west of the site.

The site is located to the southeast / east periphery of the settlement of Ashford, with much of the landscape to the west and east of the site is heavily influenced by urban land uses such as large-scale residential development, major route corridors and commercial and retail developments. Immediately west of the site and the M11/N11 and to the northwest and south of the site, the landscape begins to transition to a rural hinterland landscape and is principally dominated by pastoral farmland, areas of mature vegetation and dispersed rural settlements.

Land in the vicinity of the site will not be impacted by the Proposed Development, The majority of existing mature vegetation which bounds the site is to be retained, while further addition / planting of pollinator friendly vegetation. As such there is minimum loss of greenfield, amenity or agricultural land.

Overall, the proposed development is considered relatively modest in terms of its scale and nature, and is located within the existing agricultural land holding, which will be enhanced as part of the landscape mitigation strategy, which encompasses an array of native and pollinator friendly plantings, to enhance landscape and biodiversity in the locality / area. The proposed development is also considered a characteristic addition to the immediate landscape context, which is already heavily influenced by major route corridors.

There will be a requirement for deliveries of imported engineering fill, and other construction materials. Other construction activities will include site storage of cement and concrete materials and fuels for construction vehicles.

For further detail on the physical characteristics of the Proposed Development please refer to the architectural and engineering drawings, engineering and planning report, and the landscape drawings which accompany this planning application.

Water consumption and wastewater requirement.

As outlined in the Engineering and Planning Report provided with planning:

The water demand arises from a small staff only welfare facility.

A PCE was submitted to Uisce Éireann on 31st May 2024 for potable water, including fire flow requirements (ref CDS24004707

The proposed sites foul water demand (peak discharge of 300 litres/day) arises from a small staff only welfare facility and will be treated via a Wastewater Treatment System (Puraflo or equivalent).

Biodiversity

Investigations into the impacts on biodiversity including species and habitats has been undertaken by the Doherty Environmental Consulting (DEC). The Appropriate Assessment (AA) Screening report and Ecological Impact Assessment (EcIA) are included in Appendix B.

Pat Doherty (DEC) undertook / conducted site surveys to identify the habitats and species within the site and surrounds. The desk review and field survey are documented as part of the AA screening.

According to the NPWS (2022) on-line database there are no special protected areas or special areas of conservation on or within the boundary of the Proposed Development site. The closest European listed sites are as follow:

- The Murrough Wetlands (002249) Special Area of Conservation (SAC) - circa. 1.7 km to the east of the site.

- The Murrough (004186) Special Protected Area (SPA) – circa 1.7km to the east of the site.
- The Murrough (000730) Proposed Natural Heritage Area (pNHA) - circa 1.7 km to the east of the site.

The River Vartry is the principal surface watercourse in relation to the site and flows in a general east direction through the surrounding landscape just approximately 215m north of the site at the point of closest proximity. A small stream in the adjacent grassland fields also passes immediately south of the site, circa 170m south at its nearest point. The Proposed Development is located within the hydrological catchment of the Vartry River (Catchment: Ovoca Vartry, Subcatchment: Vartry_SC_010).

There is no stormwater drainage infrastructure currently within the site. The existing surface water drainage on this greenfield site comprises a series of interconnected ditches which convey flow towards the M11 to the northeast of the site before discharging to the Vartry River.

The site currently has an indirect hydrological pathway or connection with the Murrough Wetlands SAC and The Murrough SPA / pNHA through the local drainage network and via the River Vartry (IE_EA_10V010300) and Conroe Stream (IE_EA_10R020600) both of which generally flow in an easterly direction before discharging downstream into the Broadlough Estuary and ultimately outfalls to the Irish Sea at Wicklow Harbour. Figure 5.1 in the appendix B(i) Screening Report for Appropriate Assessment presents the location of these protected areas in the context of the subject development site.

The habitats occurring at the project site are dominated by improved agricultural grassland. Artificial surfaces in the form of existing roads surround the project site to the south and east. Hedgerows (WL1) occur along the southern and eastern boundaries of the project site. No Artificial surfaces are established on site however access is gained in the form of access tracks which occur from the southwest corner of the site from the R772 regional route. There are no aquatic habitats occurring within or immediately adjacent to the project site.

Stormwater during operation will infiltrate directly to ground via permeable asphalt in all parking bay areas, including the aisles. At locations such as the access road and bus turning area where nonpermeable surfacing is proposed, a series of gullies will convey the runoff to either the raingardens or permeable asphalt areas for infiltration.

There will be foul water arising from a welfare facility at the development during operations. 1 no. staff toilet will be provided on site. Best practice measures are included in the design and will be addressed in CEMP to negate any off-site impact on birds and bats during construction phase.

The Proposed Development is therefore considered to have an imperceptible impact on existing biodiversity resources.

Waste Management

Detail on the waste materials likely to be generated during the construction stage are presented in the project-specific Resource Waste Management Plan contained within Appendix G of this document. The RWMP provides an estimate of the main waste types likely to be generated during the Construction phase of the Proposed Development. The reuse, recycling / recovery and disposal rates have been estimated using the EPA National Waste Reports and these are summarised below.

Construction Phase

During the construction phase, waste will be produced from surplus materials such as broken or off-cuts of timber, plasterboard, concrete, tiles, bricks, etc. Waste from packaging (cardboard, plastic, timber) and oversupply of materials may also be generated. The appointed Contractor will be required to ensure that oversupply of materials is kept to a minimum and opportunities for reuse of suitable materials is maximised.

There will be soil, stones, gravel, and clay excavated to facilitate construction of new foundations. The development engineers (Clifton Scannell Emerson Associates Consulting Engineers) have estimated that the development will include the excavation of 7,401 m^3 of material.

The waste hierarchy states that the preferred option for waste management is prevention and minimisation of waste, followed by preparing for reuse and recycling / recovery, energy recovery (i.e. incineration) and, least favoured of all, disposal. The excavations are required to facilitate construction works so the preferred option (prevention and minimisation) cannot be accommodated for the excavation phase. It is currently envisaged that there will be opportunity for reuse of excavated material onsite. It is anticipated that 1,170 m^3 of excavated subsoil will be reused on site. It is anticipated that 6,231 m^3 of topsoil material will need to be removed offsite for appropriate reuse, recovery and/or disposal. This material will be taken for appropriate offsite reuse, recovery, recycling and / or disposal.

The relevant legislation is the EU council decision (2003/33/EC) which has been implemented in all member states and sets out the criteria for the acceptance of waste at Landfills.

If the material that requires removal from Site is deemed to be a waste, removal and reuse / recycling / recovery / disposal of the material will be carried out in accordance with the Waste Management Act 1996 (as amended), the Waste Management (Collection Permit) Regulations 2007 (as amended) and the Waste Management (Facility Permit & Registration) Regulations 2007 (as amended). The volume of waste requiring recovery / disposal will dictate whether a Certificate of Registration (COR), permit or licence is required for the receiving facility. Alternatively, the material may be classed as by-product under Article 27 classification (European Communities (Waste Directive) Regulations 2011, S.I. No. 126 of 2011). For more information in relation to the envisaged management of by-products, refer to the RWMP (Appendix G).

In order to establish the appropriate reuse, recovery and / or disposal route for the soils and stones to be removed off-site, it will first need to be classified. Waste material will initially need to be classified as hazardous or non-hazardous in accordance with the EPA publication *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous* (2019). Environmental soil analysis will be carried out prior to removal of the material on a number of the soil samples in accordance with the requirements for acceptance of waste at landfills (Council Decision 2003/33/EC Waste Acceptance Criteria). This legislation sets limit values on landfills for acceptance of waste material based on properties of the waste, including potential pollutant concentrations and leachability. It is anticipated that the surplus material will be suitable for acceptance at either inert or non-hazardous soil recovery facilities / landfills in Ireland or, in the unlikely event of hazardous material being encountered, be transported for treatment / recovery or exported abroad for disposal in suitable facilities.

Waste will also be generated from construction phase workers e.g. organic / food waste, dry mixed recyclables (waste paper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables and, potentially, sewage sludge from temporary welfare facilities provided on-site during the Construction phase. Waste printer / toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated in small volumes from site offices.

Further detail on the waste materials likely to be generated during the excavation and construction works are presented in the project specific RWMP (Appendix G). The RWMP provides waste management measures and an estimate of the main waste types likely to be generated during the Construction phase of the Proposed Development. These are estimated in AWN RWMP and summarised in Table 3.1 below.

Table 3.1 Estimated off-site Reuse, Recycle and Disposal Rates for Construction Waste

Waste Type	Tonnes	Reuse		Recycle/Recovery		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Mixed C&D	39.8	10	4.0	80	31.9	10	4.0
Timber	13.5	40	5.4	55	7.5	5	0.7
Metals	9.7	5	0.5	90	8.7	5	0.5
Concrete	7.2	30	2.2	65	4.7	5	0.4
Other	36.2	20	7.2	60	21.7	20	7.2
Total	**106.5**		**19.3**		**74.4**		**12.8**

Operational Phase

The Proposed Development will give rise to minor quantities of waste during the operational phase, i.e. when the project is completed, and fully operational. Given the nature and function / purpose of the development as a carpark and bus stop, the waste generated will be limited / confined to bins strategically provided and dispersed across the site for the users of the Park & Ride facility. The waste generated will be collected and disposed regularly by an assigned waste contractor in the locality.

The following waste management measures will be implemented during the operational phase:

- All waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly labelled with the approved waste type to ensure there is no cross contamination of waste materials;
- All waste collected from the development will be reused, recycled or recovered where possible, with the exception of those waste streams where appropriate facilities are currently not available; and
- All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities.

All waste contractors collecting waste from the site must hold a valid collection permit to transport waste must be held by each waste contractor which is issued by the National Waste Collection Permit Office (NWCPO) and waste will only be brought to suitably registered/permitted/licenced facilities. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices.

These measures will ensure the waste arising from the development is dealt with in compliance with the provisions of the *Waste Management Act 1996*, as amended, associated Regulations, the *Litter Pollution Act 1997* and the *EMR Waste Management Plan (2015 - 2021)*.

3.5 POLLUTION AND NUISANCES

There are potential short-term nuisances such as dust, noise, as well as the potential for pollution of groundwater or storm drains associated with, excavations and construction. A Resource Waste Management Plan (RWMP) has been prepared by AWN Consulting (Appendix G). In advance of work starting on site, the works contractor will prepare a detailed Construction Environmental Management Plan (CEMP). This CEMP will set out the overarching vision of how the construction of the Proposed Development will be managed in a safe and organised manner by the Contractor.

The CEMP includes mitigation measures to ensure that pollution and nuisances arising from site clearance and construction activities are prevented where possible and managed in accordance with best practice and any subsequent planning conditions relevant to the Proposed Development.

This CEMP will be maintained by the contractors during the construction phases and covers all potentially polluting activities and include an emergency response procedure. All personnel working on the site will be trained in the implementation of the procedures.

3.6 RISK OF MAJOR ACCIDENTS AND/OR DISASTERS

Landslides, Seismic Activity and Volcanic Activity

The Geological Survey Ireland (GSI) landslide database was consulted, whereby a landslide in closest proximity to the Proposed Development was approximately 2.9 km to the southeast of the site located directly adjacent to the Irish Rail Train Track and immediately North of East Glendalough Secondary School to the north (outskirts) of Wicklow Town referred to as the Bollarney2009 event (GSI_LS10-0003) which occurred on 16th of November, 2009 . There have been no recorded landslide events at the subject site. Due to the local topography and the underlying strata, there is a negligible risk of a landslide event occurring at the site.

In Ireland, seismic activity is recorded by the Irish National Seismic Network. The Geophysics Section of the School of Cosmic Physics at the Dublin Institute for Advanced Studies (DIAS) has been recording seismic events in Ireland since 1978. The station configuration has varied over the years. Currently there are five permanent broadband seismic recording stations in Ireland and operated by DIAS. The seismic data from the stations comes into DIAS in real-time and are studied for local and regional events. Records since 1980 show that the nearest seismic activity to the Proposed Development was in the Irish sea (1.0 – 2.0 Ml magnitude) and to the south in the Wicklow Mountains. There is a very low risk of seismic activity to the Proposed Development site. There are no active volcanoes in Ireland so there is no risk from volcanic activity.

Flooding/Sea Level Rise

The potential risk of flooding on the site was reviewed with regard to incidences of historical, regional and local flooding relevant to the area of the subject site. A Flood Risk Assessment has been prepared by CSEA/NTA and is included with the planning application documentation for the Proposed Development. Resources on flooding aspects for the subject area were reviewed and included the following:

- Catchment Flood Risk Assessment and Management (CFRAM).
- Review of Historic Flood Events Office of Public Works (OPW) on-line database (floodinfo.ie).
- Wicklow County Development Plan Strategic Flood Risk Assessment 2022-2028. / Wicklow County Council Drainage Records

The CFRAM Draft Map for the proposed site does not indicate flooding under the following headings:

- Fluvial
- Pluvial
- Groundwater

No designated flood zone is present around this site. A review of available information has identified no flood hazards at the Proposed Development site; therefore, in accordance with Flood Risk Management (FRM) Guidelines the site is located entirely within Flood Zone C, where the probability of flooding is low. Low Probability flood events have an indicative 1-in-a-1000 chance of occurring or being exceeded in any given year. This is also referred to as an Annual Exceedance Probability (AEP) of 0.1%. The Proposed Development is considered '*Appropriate'* for Flood Zone C.

Site is located north of the Conroe stream and its floodplain. The floodplain does not extend into the site and does not pose any significant flood risk, but the design and development of a Park & Ride site here will need to take this into account during the design phase.

Assessment the available information and inspected the site and its environment. The probability of flooding from rivers and the sea is low (less than 1:1000) for both river and coastal flooding which would be equivalent to Flood Zone C. The proposed development is not deemed to be at any significant risk of flooding which is mainly attributable to the local topography and therefore a stage 2 assessment in not required in relation to this site. The proposed works are unlikely to raise significant flooding issues and do not obstruct existing flow paths. The use of infiltration of the surface water from the site does not adversely affect or increase the flood risk to adjacent or downstream sites.

The proposed development does not obstruct any existing flow paths and the surface water discharge from the site is restricted to equivalent green field run off thus not impacting or increasing the flood risk within the existing catchment.

Major Accidents/Hazards

The Seveso Directive (Directive 82/501/EEC, Directive 96/82/EC, Directive 2012/18/EU) was developed by the EU after a series of catastrophic accidents involving major industrial sites and dangerous substances. Such accidents can give rise to serious injury to people or serious damage to the environment, both on and off the site of the accident. The Chemicals Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015 (S.I. No. 209 of 2015) (the "COMAH Regulations"), implement the latest Seveso III Directive (2012/18/EU).

The Proposed Development will not be a Seveso/COMAH facility. There will be no substances stored on site controlled under Seveso/COMAH. The Proposed Development site is not located within the consultation distance of any COMAH establishment that is notified to the HSA.

The Proposed Development has been designed in accordance with the Safety, Health and Welfare at Work Act 2005 (S.I. 10 of 2005) as amended and the Safety, Health and Welfare at Work (General Application) Regulations 2007 to 2016 (S.I. 299 of 2007, S.I. 445 of 2012, S.I. 36 of 2016) as amended and associated regulations.

Minor Accidents/Leaks

There is a potential impact on the receiving environment as a result of minor accidents/leaks of fuel/oils during the construction. However, the implementation of the mitigation measures as set out in the Appendices included with this report and to be included in the Construction Environmental Management Plan (CEMP) will ensure that the residual effect on the environment is imperceptible.

3.7 RISKS TO HUMAN HEALTH

The characteristics of the Proposed Development, in terms of the risks to human health have been considered in this assessment. The primary potential impacts of the Proposed Development on human health would be increase in air pollution, noise, traffic, visual impact or pollution of groundwater/drainage as a result of the Proposed Development.

The location of the Proposed Development is within a previously undeveloped site which is currently characterized by an agricultural function. The major residential locations in closest proximity to the proposed development are the settlements of Rathnew and Ashford which are both situated within the near vicinity of the site. The outskirts of both Rathnew and Ashford are located less than c. 1km to the southeast and west of the site, respectively. The larger settlement of Wicklow town is also located within the wider study area, the outskirts of which are located just over 2.5km southeast of the site. In terms of local settlement pattern in the site's immediate vicinity, the nearest dwellings to the proposed development are located along a local road some c. 150m south of the site. A cluster of residential dwellings is also located along this local road corridor further to the south again, whilst a residential cluster is also located along the R772 regional road some c. 275m west of the site. The nearest and most notable major route to the proposed development is the M11 motorway corridor, which is situated immediately east of the site and traverses the eastern half of the study area in a general north–south direction. The R772 also traverses immediately south of the site and connects the settlements of Ashford and Rathnew.

Undeveloped land lies immediately / directly to the south, north and west with agricultural land and woodland further west of the site.

The Geological Survey of Ireland data shows that the site does not lie within a drinking water protection area. The area is serviced by mains water supply therefore the majority of potable water supplied in the area is by main water. There is domestic/farm water supply well drilled in 1967 located c. 200 meters to the northwest of the site associated with the Rosanna Demesne. The use of the well is likely to be used for agricultural purposes. It is likely that the property has main water supply also.

There are no watercourses on the site and no open water connection to the local nearby surface watercourses however the regional and site drainage is to the River Vartry to the North of the site.

There is a risk that during construction contamination of a water resource could occur through the stormwater drainage system. The proposed mitigation measures to be outlined in the contractor CEMP will ensure that there will be no impacts on groundwater or the stormwater drainage system. The Proposed Development will include an appropriately designed stormwater network, including permeable asphalt in all parking bay areas, including the aisles, to promote infiltration of the storm water into the ground. The Source-Pathway-Receptor approach can be used to determine the risk to the underlying aquifer. In the event of a minor fuel spill (source) within the facility the likelihood of connection (pathway) to the underlying aquifer (receptor) is determined to be low, given the low vulnerability rating of the underlying aquifer (poorly drained soil (see Section 3.4), depth of overburden (>10 m of low permeable overburden thickness, See Section 4.2.1), and the absence of a gravel aquifer).

There is no existing foul water infrastructure in the vicinity of the site and so, the proposed 1 no. toilet within the scheme will be treated via a PCE Wastewater Treatment System or equivalent and will not have a potential impact on local amenities or the local population.

A PCE was submitted to Uisce Éireann on 31st May 2024 for potable water, including fire flow requirements (ref CDS24004707).

The CEMP will incorporate best practice construction methodologies for the control of dust generation, traffic, and noise, as well as the management of impacts on groundwater or storm drainage system during the construction phase. Any impacts associated with dust generation, traffic, and noise will be ***short term***.

The potential impacts on human health as a result of the generation of Noise and Air Emissions are considered to be ***negligible*** and have been assessed through a detailed Noise Impact Assessment. Air Quality Impact Assessment and Traffic Impact Assessment as detailed further in Appendix D and F respectively.

4.0 LOCATION AND CONTEXT OF THE PROPOSED DEVELOPMENT

4.1 EXISTING AND APPROVED LAND USE

The Proposed Development site represents a greenfield land. The site is currently comprising no hardstanding areas and is not underlain by made ground deposits according to the geotechnical site investigation carried out by Ground Investigations Ireland (2023) which comprise of six trial pits across the site.

As per the current Wicklow County Development Plan (2022-2028), the Proposed Development site occupies unzoned land whereby designated land use zoning is not in effect.

As outlined in the Planning Engineering Report prepared by CSEA and the Park and Ride Development Office which accompanies the planning application, the Proposed Development complies with the Wicklow County Development Plan 2022 - 2028. The development of the proposed Park & Ride facility complies with the following policy set down in Wicklow County Development Plan 2022-2028:

Sustainable Transportation

12.2.2 Park & Ride Facilities

The purpose of a 'Park and Ride' facility is to encourage car commuters to drive or cycle to a specific location with a car and secure bicycle park close to a high quality public transport service and to transfer to public transport, thereby reducing congestion and promoting public transport. Park and Ride sites often use valuable land adjacent to high-capacity public transport stations/stops which might be better used to provide intensive development, and therefore careful consideration will be given to ensure optimal locations, at the edge of or just outside town centres, that are attractive to users and developed for such use. The NTA has established a dedicated Park and Ride design office. Wicklow County Council is working with the NTA to determine locations for park and ride facilities along primary routes such as the M11/N11.

CPO 12.1: Through coordinated land-use and transport planning, to reduce the demand for vehicular travel and journey lengths by facilitating initiatives like carpooling and park and ride.

CPO 12.21: To promote the development of transport interchanges and 'nodes' where a number of transport types can interchange with ease. In particular:

- *to facilitate the development of park and ride facilities at appropriate locations along strategic transport corridors which will be identified through the carrying out of required coordinated, plan-led transport studies and consultation with the appropriate transport agencies and/or Regional Authority.*

CPO 16.28: To encourage carpooling and facilitate park and ride facilities for public transport

It is considered that the Proposed Development is consistent with the existing land uses and the wider residential, open space (greenfield), and commercial land uses in locality of Rathnew and Ashford towns. According to LVIA undertaken by Macro Works Ltd (2023), the development will not encroach on this area and will seek to protect and enhance the appearance of the area. The Proposed Development is considered relatively modest in terms of its scale and nature, is discretely located and is a characteristic addition to the landscape in the immediate surrounds / vicinity of the site.

4.2 RELATIVE ABUNDANCE, AVAILABILITY, QUALITY AND REGENERATIVE CAPACITY OF NATURAL RESOURCES IN THE AREA AND ITS UNDERGROUND

4.2.1 Hydrogeology and Hydrology

Inspection of the available Geological Survey of Ireland mapping shows that the bedrock geology underlying the Proposed Development site belongs the Maulin Formation, which comprises Dark blue-grey slate, phyllite & schist (Code: OTMAUL). The central portion of the site is traversed / underlain by a geological structural linework fault characterised by a northwest to southeast orientation, whereby it extends southeast below the Junction 16 and flyover of the M11. The site is underlain by Irish Sea Till derived from Cambrian sandstones and shales (subsoil). The GSI categorises the bedrock aquifer underlying the Proposed Development site as having a 'Low' vulnerability (>10 m of Low permeable overburden thickness) which is consistent with the geotechnical site investigation results (Ground Investigations

Ireland Ltd, 2023), which confirm an overburden thickness of greater than 3 meters at 6 locations across the site.

The bedrock aquifer underlying most of the Proposed Development site according to the GSI National Draft Bedrock Aquifer Map is classified as a Locally Important Aquifer (LI), Bedrock which is Moderately Productive only in Local Zones. A 'Poor Aquifer' (PI) which is described as Bedrock which is Generally Unproductive except for Local Zones is located circa 575 m northwest of the development site. The site is not located near any public groundwater supplies or group schemes. There are no groundwater source protection zones in the immediate vicinity of the site.

The Groundwater Body (GWB) underlying the site is the Wicklow GWB (IE_EA_G_076). Currently, this GWB is classified under the WFD Risk Score system (EPA, 2024) as 'At Risk' of not achieving good status. The Dublin GWB was given a classification of 'Good' for the last WFD cycle (2016-2021).

Consultation with the EPA mapping database concludes that the River Vartry waterbody (VARTRY_040) which is located c. 215 m to the north of the site, is currently classifies as having 'Moderate' status (3rd Cycle 2016-2021) and as having a risk score (3rd cycle) of being 'Under Review'. This risk score is attributed to the ecological status or potential (Moderate) and chemical surface water status and potential (Fail), thereby resulting in potential harm to the river ecosystems. An active EPA water quality station is located in close proximity (c.520 m downstream east) to the subject site at Newrath Bridge over the R761 Regional Route (Station Name: 'Newrath Br', Station Code: RS10V010300); this station is classified with a Biological Q Rating of 'Q4' according to its 2020 records, which denotes a 'Unpolluted' status in the river. This is consistent with historical ecological conditions recorded in the River Vartry during previous years.

The contractor will be required to operate in compliance with a Construction Environmental Management plan to include the mitigation measures included in the support report to manage any accidental risk of discharge of sediment or hydrocarbon contaminated water during construction.

During operation of the proposed development, there is no direct discharge proposed to the River Vartry however there is a proposed discharge of stormwater arising from the site to ground via permeable asphalt and raingardens.

OPW Flood Maps show that the area proposed for development is located within Flood Zone C (i.e., where the probability of flooding or AEP from rivers is less than 0.1% or 1 in 1000).

Based on the hydrogeological and hydrological assessment present above. It is considered that the Proposed Development will have an ***imperceptible*** (following EIA guidance) impact on the existing water environment.

4.2.2 Biodiversity

The potential ecological impacts of Proposed Development have been considered in terms of the sensitivity of the location through the Doherty Environmental Consulting Appropriate Assessment (AA) Screening report (2023) included as Appendix B of this document.

The habitats occurring at project site are dominated by improved agricultural grassland. Artificial surfaces in the form of existing roads surround the project site to the south and east. Hedgerows (WL1) occur along the southern and eastern boundaries of the project site. No Artificial surfaces in the form of existing roads or access tracks occur within or the project site. The site remains unoccupied by building structures. There are no aquatic habitats occurring within or immediately adjacent to the project site. No breeding or resting sites for non-volant mammals occur within or bounding the project site. The project site supports a range of commonly occurring bird species. Bat activity was also recorded at the project site during baseline bat surveys.

A review of historical maps aerial imagery from 1995 indicates that the project site was previously used for agricultural purposes, most likely as Pasture (GA1) or Arable land (BC1). A review of historical aerial imagery from 1995 indicates that the project site was part of a larger pasture at this time. The field was severed by the M11. The 1995 imagery shows the field boundary hedgerow and treelines occurring to the west of the site that terminates at the R722. The 2000 aerial imagery does not indicate any apparent change in land cover and habitats between 1995 and 2000. The 2005 imagery depicts a change to land cover immediate to the east of project site with the presence of the newly constructed and operational M11 motorway.

Imagery from 2011 – 2013 depicts the current land cover and habitats at project site.

The 25-inch and 6-inch historical mapping for the lands at and surrounding project site suggest that these lands were enclosed at these times presumably for agricultural pasture.

No European Sites are occurring at or in the immediate vicinity of the project site. The designated conservation area (jointly referred to as European Site) in closest proximity to the proposed development is the Murrough Wetlands SAC, SPA and pNHA, located approximately 1.5km to the east overland (linear distance).

Given the significant buffer distance from the nearest European Site, the project will not have the potential to result in direct impacts to European Sites, such as loss, habitat damage or disturbance to Annex 1 qualifying habitats or physical interaction with Annex 2 qualifying species/special conservation interest bird species within the boundary of the European Site. Thus, this Screening exercise focuses on investigating whether it can or cannot be excluded, on the basis of objective information, that the project will have the potential to result in indirect effects to European Sites (i.e., impacts via emission pathways or interaction with mobile species outside of European Sites).

The absence of any potential impact pathways as identified in the AA Screening will ensure that this project does not have the potential, either alone or in combination with other projects, to result in likely significant effects to European Sites or the local environment surrounding the project site.

The AA Screening concluded that:

- The Proposed Development is not directly connected with, or necessary to the conservation management of the European sites considered in this assessment.
- The Proposed Development, alone or in combination with other projects, is not likely to have significant effects on the European sites considered in this assessment.
- It is possible to rule out likely significant impacts on any European sites considered in the assessment.

- It is possible to conclude that there would be no significant effects, no potentially significant effects and no uncertain effects if the Proposed Development were to proceed.

Given that no European Sites occur within or bounding the project site a source-pathway-receptor model was used to identify the presence of any European Sites in the wider surrounding area occurring within the zone of influence of the project. The examination based on the source-pathway-receptor model found that no pathways connect the project site to the any European Sites occurring in the wider area surrounding the project site and there will be no potential for the project to interact with them or their qualifying features of interest/special conservation interests. Given the absence of any pathways and any European Sites within the zone of influence of the project, there will be no potential for the project to combine with other plans, projects or existing pressures to result in cumulative adverse effects to European Sites in the wider surrounding area.

In light of the findings of this report it is the considered view of the authors of this Screening Report for Appropriate Assessment that it can be concluded by Wicklow County Council that the project is ***not likely***, alone or in-combination with other plans or projects, to have a ***significant effect*** on any European Sites in view of their Conservation Objectives and on the basis of best scientific evidence and there is no reasonable scientific doubt as to that conclusion.

This Screening has resulted in a Finding of No Significant Effects and as such a Stage II Appropriate Assessment is not required.

4.3 ABSORPTION CAPACITY OF THE NATURAL ENVIRONMENT

The Proposed Development, due to its size and localised nature will not have any effect on wetlands, riparian areas, river mouths, coastal zones and the marine environment, mountain and forest areas, nature reserves and parks, or densely populated areas.

The environmental sensitivity of the proposed location in respect of Natura 2000 areas designated pursuant to the Habitats Directive and the Birds Directive been addressed through the AA Screening (Appendix B).

The Archaeological assessment undertaken by Courney Deery Associates in Appendix H has considered the landscapes and sites of historical, cultural or archaeological significance that are likely to be affected by the Proposed Development.

The Archaeological assessment concluded that there are no recorded archaeological sites or national monument within the site boundary / study area (as listed in the Record of Monuments and Places for Co. Wicklow), hence ***no archaeological / heritage site will be impacted***, directly or indirectly, by the Proposed Development, due to its distance of separation.

However, while there are no recorded / documented archaeological sites within the boundary outline of this previously undeveloped greenfield site, multiple archaeological sites and features were identified during archaeological investigations in advance of the construction of the M11 motorway where it runs alongside the proposed development site, including an urn burial, cremation burial, and medieval enclosure. None of these sites had any above-ground remains and all were previously unknown.

The results and findings of these excavations and the presence of other recorded monuments in the local vicinity indicate that this area comprises part of a Bronze Age landscape and that there was also settlement in the medieval period.

It is anticipated that further archaeological or cultural heritage mitigation is required in order for the development to proceed.

A geophysical survey of the site has taken place and can be seen Section 9 of the Cultural Heritage Impact Assessment Report. The aim of a geophysical survey is to identify any previously unknown archaeological sites or features that may be present within the proposed development site.

The geophysical survey did not identify any definite archaeology, but there were numerous discrete, small-scale anomalies (possible pits), as well as curvilinear and linear trends, for which a cautious archaeological interpretation is considered.

Archaeological testing will be required to confirm whether the anomalies identified by the geophysical survey within the proposed development site are archaeological in nature, and if so, to establish their nature, extent, and date. Testing will also provide a more detailed and clear assessment of the effect that the proposed development would have on archaeological material and allow for the development of a suitable mitigation strategy.

5.0 TYPES AND CHARACTERISTICS OF POTENTIAL IMPACTS

This section sets out the likely significant effects on the environment of the Proposed Development in relation to criteria set out under paragraphs 1 and 2 (as set out in Sections 4 and 5 above), with regard to the impact of the project on the factors specified in paragraph (b)(i)(I) to (v) of the definition of 'environmental impact assessment report' in section 171A of the Act (as amended).

The quality, magnitude and duration of potential impacts are defined in accordance with the criteria provided in the *Guidelines on Information to be contained in Environmental Impact Assessment Reports* (EPA, 2022).

5.1 POPULATION AND HUMAN HEALTH

5.1.1 Construction Phase

The potential impacts of the Proposed Development on human health and populations would be nuisances such as increased air pollution (dust), noise, traffic, and visual impact and construction waste. There is no significant risk of pollution of soil, groundwater or watercourses associated with the Proposed Development.

The CEMP will set out requirements and standards in relation to construction noise, traffic, and dust generation that must be met during the construction stage and will include any subsequent planning conditions relevant to the Proposed Development.

The potential impact of the Proposed Development with respect to population and human health during the construction phase is ***negative***, ***not significant*** and **short-term**. There are no likely significant effects in terms of the population and human health during the construction phase and it would not warrant preparation of an EIA report on these grounds.

5.1.2 Operational Phase

A detailed Air Quality Impact Assessment has been undertaken (discussed in Section 5.4) to assess the impact of the Proposed Development with reference to human health criteria and concluded, based on conservative assumptions, that the Proposed Development will not result in any off-site exceedance of the relevant ambient air quality standards. Air dispersion modelling of operational traffic emissions associated with the Proposed Development was carried out using the TII REM tool. The modelling assessment determined that the change in emissions of NO_2 and PM_{10} at nearby sensitive receptors as a result of the Proposed Development will be neutral. Therefore, the operational phase impact to air quality is ***long-term, localised, neutral, imperceptible*** and ***non-significant***.

Emissions of air pollutants are predicted to be significantly below the ambient air quality standards which are based on the protection of human health. Therefore, impacts to human health are ***long-term, direct, neutral***, ***imperceptible*** and ***non-significant***.

Noise reduction is a central consideration in the design of the Proposed Development. Based on the findings of the Noise and Vibration Impact Assessment (Appendix C) the predicted noise levels from the Proposed Development, comply with the relevant noise criteria.

There are no planned direct discharges to water or land, although the risk of accidental discharge or spills exists. A number of design measures will be adopted to prevent the contamination of groundwater during the operational phase as described in Section 5.2

The design of the Proposed Development has due regard of the sensitivity of the surroundings. Landscape and Visual impacts are discussed further in Section 5.7.

The potential impact of the Proposed Development with respect to populations and human health during the operational phase is ***neutral***, ***not significant*** and ***long-term***. There are no likely significant effects in terms of the populations and human health as during the operational phase, and it would not warrant preparation of an EIA report on these grounds.

5.2 LAND, SOILS, GEOLOGY, HYDROGEOLOGY, HYDROLOGY

5.2.1 Construction Phase

<u>*Soil Handling, Removal and Compaction*</u>

Currently, there is no evidence of contamination on site. In the event that contaminated material is found on site, this material will need to be segregated from clean/inert material, tested and classified as either non-hazardous or hazardous in accordance with the EPA publication entitled *'Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-Hazardous'* using the *HazWasteOnline* application (or similar approved classification method). The material will then need to be classified as clean, inert, non-hazardous or hazardous in accordance with the *EC Council Decision 2003/33/EC*, which establishes the criteria for the acceptance of waste at landfills.

All excavated materials will be visually assessed for signs of possible contamination such as staining or strong odours. Should any unusual staining or odour be noticed, samples of this soil will be analysed for the presence of possible contaminants in order to ensure that historical pollution of the soil has not occurred. Should it be determined that any of the soil excavated is contaminated, this will be disposed of by a licensed waste disposal contractor.

Material, which is exported from site, if not correctly managed or handled, could impact negatively on human beings (onsite and offsite) as well as water and soil environments. The project specific CEMP will set out best practice construction methodology to manage the soil movement on the site.

Accidental Spills, Run-off and Sediment Loading

Surface water run-off from site preparation, levelling, landscape contouring and excavations during the construction phase may contain increased silt levels or become polluted from construction activities. As there is no open water connection with the Vartry River or Cronroe Stream, the potential for impact is negligible. The contractor will be required to operate in compliance with a CEMP to minimise the potential for contaminated water to discharge to sewers.

No dewatering is anticipated to be required for construction as groundwater is at a sufficient depth in comparison to required excavation levels and water ingress will be unlikely to occur. Water ingress was not encountered during the Ground Investigations Ireland trial pitting exercise completed to a depth of 3.0 meter below ground level.

If groundwater is encountered during excavations, then mechanical pumps will be required to remove the groundwater from sumps. Sumps should be carefully located and constructed to ensure that groundwater is efficiently removed from excavations and trenches. Any groundwater ingress to excavations will be pumped to a construction phase treatment train that will comprise a mobile attenuation tank and buffered outfalls over vegetated ground to the west of the project site.

Wastewater

Welfare facilities will be provided for the contractors on site during the construction works. During construction, portable sanitary facilities will be provided with waste collected and disposed of appropriately to an appropriate licenced facility. There are no predicted adverse impacts on wastewater systems during construction.

Conclusions

The predicted impact on land, soils, geology, hydrogeology, and hydrology during construction is considered to be ***negative, imperceptible*** and **short-term**. There are no likely significant effects in terms of the land, soils, geology, hydrogeology, and hydrology during the construction phase and it would not warrant preparation of an EIA report on these grounds.

5.2.2 Operational Phase

Increase in Hardstand

There will be an increase in hardstand including permeable paving as a result of the Proposed Development. The Proposed Development's surface water drainage system was designed in accordance with the Greater Dublin Strategic Drainage Strategy (GDSDS) and consists of two separate systems.

- To comply with the GDSDS guidelines in relation to SUDs, permeable asphalt is proposed in all parking bay areas, including the aisles, to promote infiltration of the storm water into the ground.
- At locations such as the access road and bus turning area where nonpermeable surfacing is proposed, a series of gullies will convey the runoff to either the raingardens or permeable asphalt areas for infiltration.

Accidental Spill and Leaks

The project will not be connected to the receiving surface water environment during the operation phase as all storm water will be discharged and infiltrated to ground. There will be no connection to the existing stormwater network or the surrounding surface water environment.

Conclusions

The predicted impact on land, soils, geology, hydrogeology, and hydrology during operation is considered to be ***neutral, imperceptible and long term.*** There are no likely significant effects in terms of land, soils, geology, hydrogeology, and hydrology and it would not warrant preparation of an EIA report on these grounds.

5.3 BIODIVERSITY

5.3.1 Construction Phase

A baseline review of biodiversity at the site was carried out by the project ecologists Doherty Environmental. No invasive species were detected during the ecological survey of the site; hence an invasive species management plan will not be required to be produced / submitted to WCC.

The potential impact from the Proposed Development on biodiversity with particular attention to species and habitats protected under the Habitats Directive and the Birds Directive has been considered as a part of the AA Screening provided in Appendix B.

No breeding or resting sites for non-volant mammals (fauna) occur within or bounding the project site. The project site supports a range of commonly occurring bird species. Bat activity was also recorded at the project site during baseline bat surveys.

The habitats occurring at the project site are dominated by improved agricultural grassland. Artificial surfaces in the form of existing roads surround the project site to the south and east. Hedgerows (WL1) occur along the southern and eastern boundaries of the project site.

Multiple European Sites occur in the wider area surrounding the project site. The conservation area in closest proximity to the site is the Murrough Wetlands SAC, SPA and pNHA, located approximately 1.5km to the east overland. All other European Sites are located at greater distance from the project site.

Given that no European Sites occur within or bounding the project site a source-pathway-receptor model was used to identify the presence of any European Sites in the wider surrounding area occurring within the zone of influence of the project. The examination based on the source-pathway-receptor model found that no pathways connect the project site to the any European Sites occurring in the wider area surrounding the project site and there will be no potential for the project to interact with them or their qualifying features of interest/special conservation interests. Given the absence of any pathways and any European Sites within the zone of influence of the project, there will be no potential for the project to combine with other plans, projects or existing pressures to result in cumulative adverse effects to European Sites in the wider surrounding area

In light of the above findings, it can be concluded by DEC Ltd (2023) that the project is not likely, alone or in-combination with other plans or projects, to have a significant effect on any European Sites in view of their Conservation Objectives and on the basis of best scientific evidence and there is no reasonable scientific doubt as to that conclusion. Hence, this Screening has resulted in a finding of No Significant Effects and as such a Stage II Appropriate Assessment is not required.

The Proposed Development is predicted to have a neutral imperceptible effect on biodiversity. On the basis of the above with regard to the evidence set out within the AA Screening Report and the EcIA the potential effects on local biodiversity and ecology are ***neutral***, ***imperceptible,*** and ***short term*** for the construction phase. There are no likely significant effects in terms of biodiversity and ecology, and it would not warrant preparation of an EIA report on these grounds.

5.3.2 Operational Phase

To comply with the GDSDS guidelines in relation to SUDs, permeable asphalt is proposed in all parking bay areas, including the aisles, to promote infiltration of the storm water into the ground. At locations such as the access road and bus turning area where nonpermeable surfacing is proposed, a series of gullies will convey the runoff to either the raingardens or permeable asphalt areas for infiltration.

The proposed surface water drainage design includes discharge to ground via permeable asphalt and rain gardens, therefor there is no direct or indirect connection or linkage to the nearby watercourses.

The operational phase of the Proposed Development is not predicted to have any ***imperceptible*** impact on biodiversity.

5.4 AIR QUALITY AND CLIMATE

5.4.1 Construction Phase

During the construction stage the main source of air quality impacts will be as a result of fugitive dust emissions from site activities and the potential for nuisance dust. Dust emissions will primarily occur as a result of site preparation works, earthworks and the movement of trucks on site and exiting the site.

There is no demolition associated with the Proposed Development. Earthworks primarily involve excavating material, loading and unloading of materials, tipping and stockpiling activities. Activities such as levelling the site and landscaping works are also considered under this category. The site area is greater than 10,000 m^2. This coupled with potentially dusty soil type (e.g. clay which will be prone to suspension when dry due to small particle size) indicates therefore, the dust emission magnitude for the proposed earthwork activities can be classified as large. This combined with the low sensitivity results in an overall ***low risk*** of dust soiling impacts and human health impacts as a result of the proposed earthworks activities.

In terms of construction dust impacts, the concern from a health perspective is focussed on particles of dust which are less than 10 microns (PM_{10}) and less than 2.5 microns ($PM_{2.5}$). With regards to larger dust particles that can give rise to nuisance dust, there are no statutory guidelines regarding the maximum dust deposition levels that may be generated during the construction phase of a development in Ireland. During the peak excavation phase there will be a maximum of 50 outward HGV (>3.5T) movements per day. In addition, there is some areas of up to 100m of unpaved road on site. Therefore, the dust emission magnitude for the proposed trackout can be classified as Large with some passenger shelters, bike shelter and lockers and driver welfare facilities. This coupled with the low sensitivity results in an overall ***Low Risk*** of dust soiling impacts and human health impacts as a result of the proposed trackout activities.

In terms of receptor sensitivity to dust soiling, there are no high sensitivity residential properties within 100 m of the proposed development site boundary. There are between 10-100 no. high sensitivity residential between 100 and 350 m from the boundary. Therefore, the overall sensitivity of the area to dust soiling impacts is considered low based on the IAQM criteria (AWN Consulting, 2023). The site area is greater than 10,000 m2. Therefore, the dust emission magnitude for the proposed earthwork activities can be classified as large. This combined / coupled with the low sensitivity, results in an overall low risk of dust soiling impacts and human health impacts as a result of the proposed earthworks activities.

The dust emission magnitude for the proposed construction activities can be classified as small (Total building volume < 25,000 m^3, construction material with low potential for dust release e.g. metal cladding or timber). The construction processes will have low dust potential due to elements being preconstructed. This combined with the low sensitivity of the area to dust soiling, results in an overall ***Negligible Risk*** of dust soiling impacts and human health impacts as a result of the proposed earthworks activities. Subsequently, there is low potential for fugitive dust generation during construction therefore, the predicted impact of the construction works on air quality as a result of dust emissions will therefore be ***short-term*** and ***imperceptible***.

Construction stage traffic also has the potential to impact air quality through vehicle exhaust emissions. According to the Traffic Impact Assessment conducted by CSEA (2023) for the Proposed Development, the construction stage traffic has been reviewed in line with the TII screening criteria (Section 2.2) and it was determined that a detailed air quality modelling assessment of construction stage traffic was not required due to the low-level changes in traffic and low volume of construction stage traffic. As the construction stage traffic did not meet the screening criteria, a detailed air quality assessment of construction stage traffic emissions was screened out. It can be concluded that construction phase traffic emissions will have a ***short-term, localised, neutral,*** and ***non-significant*** impact on air quality.

The CEMP will set out minimisation measures to ensure nuisance dust arising from site clearance and construction activities is prevented where possible and managed in accordance with best practice and any subsequent planning conditions relevant to the Proposed Development. When the dust mitigation measures (detailed in the mitigation section of previously mentioned Air Quality report, Section 7.1) are implemented, the residual effect of fugitive emissions of dust and particulate matter from the site will be ***short term, direct, negative,*** and ***slight*** in nature, posing no nuisance at nearby receptors.

Best practice mitigation measures are proposed for the construction phase of the Proposed Development which will focus on the pro-active control of dust and other air pollutants to minimise generation of emissions at source. The mitigation measures that will be put in place during construction of the Proposed Development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of human health. Therefore, the residual effect of construction of the Proposed Development will be ***short term, direct, negative*** and ***slight*** with respect to human health.

Impacts to climate are considered ***short-term*** and ***imperceptible*** and will not impact Ireland's ability to meet its GHG targets under Regulation (EU) 2018/842.

On the basis of the above with regard to the evidence set out within the Air Quality Impact Assessment the potential effects on Air Quality and Climate are ***negative***, ***imperceptible,*** and ***short term*** for the construction phase. There are no likely significant effects in terms of Air Quality and Climate, and it would not warrant preparation of an EIA report on these grounds.

5.4.2 Operational Phase

An Air Quality Impact Assessment has been undertaken by AWN Consulting and included in Appendix D. The assessment was carried out to determine the potential air quality impacts for the Proposed Development. A number of modelling scenarios were investigated for the purposes of this assessment. Both normal day-to-day testing operations were considered as well as emergency operations and testing operations. The impact of NO_2 and PM_{10} emissions for the opening and design years was predicted at the nearest sensitive receptors to the development. The TII guidance PE-ENV-01106 (TII, 2022a) details a methodology for determining air quality impact significance criteria for TII road schemes and infrastructure projects however, this significance criteria can be applied to any development that causes a change in traffic.

The annual average concentration of NO_2 is in compliance with the limit value at the worst-case receptors in 2025 and 2040. Concentrations of NO_2 are at most 27% of the annual limit value in 2025 and 2040. There are predicted to be some increases in traffic between the opening and design years therefore, any decrease in concentration is due to increased uptake in electric vehicles and lower vehicle exhaust emissions. In addition, the TII guidance (2022a) states that the hourly limit value for NO2 of 200 µg/m3 is unlikely to be exceeded at roadside locations unless the annual mean is above 60 µg/m3. As predicted NO2 concentrations are significantly below 60 µg/m3 (Appendix D, Table 13) it can be concluded that the short-term NO2 limit value will be complied with at all receptor locations.

Concentrations of PM_{10} are at most 33% of the annual limit value in 2025 and 2040. In addition, the Proposed Development will not result in any exceedances of the daily PM_{10} limit value of 50 $\mu g/m^3$.

Air dispersion modelling of operational traffic emissions associated with the Proposed Development was carried out using the TII REM tool. The modelling assessment determined that the change in emissions of NO_2 and PM_{10} at nearby sensitive receptors as a result of the Proposed Development will be neutral. Therefore, the operational phase impact to air quality is ***long-term, localised, neutral, imperceptible*** and ***non-significant***.

Emissions of air pollutants are predicted to be significantly below the ambient air quality standards which are based on the protection of human health. Therefore, impacts to human health are ***long-term, direct, neutral***, ***imperceptible*** and ***non-significant***.

Overall, the potential impact of the Proposed Development on ambient air quality in the operational stage is considered ***long-term, localised, neutral, imperceptible*** and ***non-significant.***

There are no likely significant effects in terms of Air Quality, and it would not warrant preparation of an EIA report on these grounds.

5.5 NOISE & VIBRATION

A site-specific Baseline Noise Assessment / Survey and Vibration Impact Assessment Report (Appendix C) has been prepared by AWN Consulting, this is provided with the planning documentation. This report has included the following:

- Review appropriate guidance, and standard documents relating to environmental noise, typical local authority planning conditions, etc. in order to identify appropriate noise criteria for the construction phase of the development and site operations.
- A review of the noise levels associated with the Proposed Development in light of relevant best practice noise guidance has been completed considering:
    - Construction Noise
    - Additional traffic movements on public roads
    - Vehicle activity on new site roads, and
    - Car parking on site
- A description of the existing noise climate captured through environmental noise surveys at locations representative of the nearest noise sensitive locations to the development site.
- Description of noise modelling assessment relating to operational phase.
- Assessment of predicted levels against the appropriate criteria and existing noise levels and the required mitigation measures.
- A review of typical construction noise and vibration limits

5.5.1 Construction Phase

In the absence of specific noise limits, appropriate criteria relating to permissible construction noise levels for a development of this scale may be found in the *British Standard BS 5228 – 1: 2009+A1:2014: Code of practice for noise and vibration control on construction and open sites – Noise*.

The largest noise and vibration impact of the Proposed Development will occur during the construction phase due to the operation of various plant machinery and HGV movement to, from and around the site. However, the construction phase can be classed as a short-term phase. The daytime significance threshold for construction noise at the site is set at 65 dB $L_{Aeq,T}$. A night-time threshold is not included as construction work will not be taking place at night.

Furthermore, the application of binding hours as set down by planning conditions for construction, along with implementation of appropriate noise and vibration control measures, will ensure that noise and vibration impact is kept to a minimum.

The CEMP will set out mitigation measures to ensure nuisance noise arising from ground excavation, site clearance, loading lorries (dozers, tracked excavators and wheeled loaders) and construction activities is prevented where possible and managed in accordance with best practice and any subsequent planning conditions relevant to the Proposed Development.

A traffic impact assessment relating to the Proposed Development has been prepared as part of this planning assessment. Information from this report has been used to determine the predicted change in noise levels in the vicinity of a number of roads in the area surrounding the Proposed Development, for the opening and design years. The results of the predictions indicate that the noise impact due to increased traffic on existing roads will be negligible.

On the basis of the above with regard to the evidence set out within the Noise and Vibration Impact Assessment, predictions indicate that during the construction phase construction noise levels will be within the adopted criteria and that impacts will be ***not significant***. There are no likely significant effects in terms of Noise and Vibration, and it would not warrant preparation of an EIA report on these grounds.

5.5.2 Operational Phase

The key potential noise source associated with the site operation relates to traffic along the existing road network and traffic entering and exiting the car park. Given the existing road network already carries high traffic volumes, it is appropriate to consider the change in traffic noise level that may arise with and without the car park in operation.

An assessment of the overall change in noise level when considering both the additional traffic on public roads and additional traffic on the new access road and car park concludes in all operational instances a negligible and imperceptible impact is identified and therefore, based on the assessment, no significant impact on residential amenity is predicted from the proposed operations.

In all operational instances a negligible impact is identified and therefore, based on the assessment presented here, no significant impact on residential amenity is predicted from the proposed operations (whereby changes in traffic noise levels are less than 3dB, the impact is deemed not significant).

On the basis of the above with regard to the evidence set out within the Noise and Vibration Impact Assessment in Appendix C, the potential effects on noise and vibration are ***imperceptible*** and ***long term*** for the operational phase. There are no likely significant effects in terms of Noise and Vibration, and it would not warrant preparation of an EIA report on these grounds.

5.6 LANDSCAPE AND VISUAL IMPACT

Macro works Ltd has undertaken a landscape assessment in order to assess the risks to both the known and potential archaeological heritage resource as a result of the Proposed Development. This assessment is included as Appendix I.

5.6.1 Construction Phase

There will be construction stage landscape impacts relating to the excavation of materials, temporary storage of such materials and other building materials, and the occasional movement of construction machinery. However, such construction stage impacts will be temporary in duration and will cease once the facility is complete. There will be some minor hedgerow removal/cutting back at the existing site entrance to achieve the proposed sightlines.

Construction of the Proposed Development will give rise to short term and substantially localised effects on landscape character. Within the local context, the magnitude of development is considered Low. Construction activity including movement of construction vehicles and gradual emergence of structures will result in localised disturbance. The predicted impact on landscape and visual impact during construction is ***neutral to negative, slight and short term in duration***. There are no likely significant effects in terms of the Landscape and Visual Impact during construction, and it would not warrant preparation of an EIA report on these grounds.

5.6.2 Operational Phase

In terms of impacts on the character of the receiving landscape, these will be notably diluted by the fact that the proposed development is currently influenced by the existing M11 corridor, which the proposed development is thematically linked to. There will also be an increase in road traffic along the surrounding road network, however, this will not be out of character within this landscape context that is influenced by an existing major route corridor. Even if viewed from the immediate surrounding landscape, the proposed development represents the intensification of major route infrastructure, which is the primary influence on the landscape in the immediate surrounds of the site. Furthermore, the proposed development is not out of character in this 'Corridor Area' landscape character unit.

Overall, the proposed development is considered relatively modest in terms of its scale and nature, and is located within the existing agricultural land holding, which will be enhanced as part of the landscape mitigation strategy, which encompasses an array of native and pollinator friendly plantings. The proposed development is also considered a characteristic addition to the immediate landscape context, which is already heavily influenced by major route corridors.

As per the current Wicklow County Development Plan (2022-2028), the Proposed Development site occupies unzoned land whereby designated land use zoning is not in effect. It is projected that there will be a substantial increase in public transport demand between 2021 and 2042 with significant population increases forecasted along the corridor and planned road capacity improvements of the M11. The demand for Park & Ride will further increase as the public transportation mode share increases to accommodate the expected increase in trips to 2042.

Currently insufficient capacity along a section of this route between the Glen of the Downs (i.e., just north of Junction 7) and Dublin City to cater for existing demand during peak periods. Thus, the N11/M11 is subject to heavy congestion during these times. Most trips using the N11/M11 corridor during peak times are taken by single occupancy car commuters. These road users occupy a high proportion of road space per person compared with the equivalent space occupied per person travelling on Public Transport1. Therefore, the transfer of a proportion of these single occupancy car trips onto public transport by intercepting car trips where people are reliant on a private car at an early viable point in their journey thereby reducing the distances travelled by private cars with a **corresponding reduction in carbon emissions** and congestion along this corridor. Reduce reliance on the private car, reduce distances travelled by car and ensure Park and Ride facilitates greater use of sustainable modes. Thus, given the sites location, its good quality road / bike pedestrian access and connectivity to / from the motorway via the interchange, it is considered that the proposed Park and Ride facility is an appropriate land uses in within this land use zoning. The objective through the design is to protect and enhance the existing landscape.

The Landscape Design Rationale prepared by Macroworks describes the landscape design, which forms an integral part of the overall design. The Landscape and Visual Assessment conducted by Macro Works Ltd indicates that the landscape sensitivity in the vicinity of the site is varied. The proposed development site is located in an area of classified with a 'Low Sensitivity', whilst some localised parts of the immediate surrounding landscape are classified with a 'Medium-High' sensitivity classification, which principally relates to local rivers and streams such as the River Varty to the north of the site. In the wider surrounds of the site, the landscape to the east is generally classified with a 'Low' sensitivity as it is principally characterised by typical rural farmland and urban area. Whereas a notable area of 'High' sensitivity occurs in the wider landscape to the east of the site and relates to the landscape unit 'Coastal Area (Area of Natural Beauty). The Proposed Development is considered relatively modest in terms of its scale and nature, is discretely located and is a characteristic addition to the landscape in the immediate surrounds / vicinity of the site.

According to Macro Works Ltd (2023), the development will not encroach on this area which is characterized by a robust and heavily modified landscape context that is notably influenced by the existing M11 motorway corridor, and instead will seek to protect and enhance the appearance of the area. The proposed park and ride facility is considered an appropriately site development that will only have a modest physical impact on the receiving landscape. Impacts on the local landscape character will be limited to the immediate surrounds of the site due to the high degree of intervening vegetation that occurs in the immediate surrounds of the site, which limits any clear visibility of the proposed development to a brief section of the R772 regional road corridor south of the site. Furthermore, this is not considered a highly rare of distinctive landscape setting, which is further reinforced by the 'Low' landscape sensitivity that contains much of the site and surrounding local landscape context.

In order to facilitate the proposed park and ride facility there will be a requirement to completed cut and fill works. Whilst every effort has been made to reduce the need for large areas of cut and fill, there will be some areas of soil stripping to accommodate the proposed access tracks, parking bays and footpaths. There will be also be physical disturbance of soil/subsoil to accommodate the foundations of the proposed structures, such as the proposed bus shelters, bicycle shelters, charging points and lighting poles. Overall, the physical impacts of the Proposed Development on the receiving landscape will be relatively modest and limited to the immediate surrounds of the site due to the high degree of intervening vegetation that occurs in the immediate surrounds of the site, which limits any clear visibility of the proposed development to a brief section of the R772 regional road corridor south of the site. Furthermore, this is not considered a highly rare of distinctive landscape setting, which is further reinforced by the 'Low' landscape sensitivity that contains much of the site and surrounding local landscape context.

According to LVIA undertaken by Macro Works Ltd (2023), the development will not encroach on this area and will seek to protect and enhance the appearance of the area. The Proposed Development is considered relatively modest in terms of its scale and nature, is discretely located and is a characteristic addition to the landscape in the immediate surrounds / vicinity of the site.

The proposed park and ride facility is considered an appropriate site development that will only have a very modest physical impact on the receiving landscape. Impacts on the local landscape character will also be diminished by the heavily contained nature of the site, which is currently influenced by an array of anthropogenic land uses such as existing major route infrastructure and residential development. In terms of visual impacts, there will be limited potential to get any clear views of the site due to the surrounding mature vegetation that encloses the site, combined with the additional proposed landscaping measures. Thus, it is considered that in this robust and heavily modified landscape context, the significance of landscape and visual impacts will be no greater than **Slight**, and in the majority of cases, the significance of visual impact is likely to be **Imperceptible** and it would not warrant preparation of an EIA report on these grounds.

5.7 ARCHAEOLOGY, ARCHITECTURE AND CULTURAL HERITAGE

Courtney Deery Heritage Consultancy Ltd (2023) has undertaken an archaeological assessment (Cultural Heritage Impact Assessment Report) in order to assess the risks to both the known and potential archaeological heritage resource as a result of the Proposed Development. This assessment is included as Appendix H.

5.7.1 Construction Phase

The archaeological, architectural and cultural heritage impact at the site can be summarised as follows:

Archaeological and Cultural Heritage

- There are no recorded archaeological sites or national monuments within the Proposed Development lands, as listed in the Record of Monuments and Places for Co. Wicklow.
- As demonstrated by aerial image the Park and Ride site has been previously undisturbed and has been subjected to previous archaeological monitoring, whereby no features of archaeological interest or potential were uncovered or detected.
- While there are no recorded / documented archaeological sites within the boundary outline of this previously undeveloped greenfield site, multiple archaeological sites and features were identified during archaeological investigations in advance of the construction of the M11 motorway where it runs alongside the proposed development site, including an urn burial, cremation burial, and medieval enclosure. None of these sites had any above-ground remains and all were previously unknown.
- The results and findings of these excavations and the presence of other recorded monuments in the local vicinity indicate that this area comprises part of a Bronze Age landscape and that there was also settlement in the medieval period.
- Two hut sites (SMR WI025-101 & -102), of possible Bronze Age date, were excavated c. 200m to the south / south-east.
- A mound (RMP WI025-007) and a ring-ditch (RMP WI025-036) are recorded within Rossana Demesne, c. 200m northwest of the proposed development site.
- An urn burial and a cremated pit burial (SMR WI025-107 & -108) were excavated immediately east of, and in the former same field as, the proposed development site. Investigations here also identified a medieval enclosure, three post-medieval enclosures and a fourth enclosure of unknown date (SMR WI025-106).
- The wider area was also occupied during the early medieval period, with a ringfort, associated enclosure, and field systems (RMP WI025-008, -009, -009001, -068) recorded in Newrath townland.

- None of the responses identified in the geophysical survey within the proposed development site were interpreted as definite archaeology, but there were numerous discrete, small-scale anomalies (tentatively, possible pits), as well as curvilinear and linear trends, for which a cautious archaeological interpretation is considered.
- It is anticipated that further archaeological or cultural heritage mitigation is required in order for the development to proceed.
- Archaeological testing will be required to confirm whether the anomalies identified by the geophysical survey within the proposed development site are archaeological in nature, and if so, to establish their nature, extent, and date. Testing will also provide a more detailed and clear assessment of the effect that the proposed development would have on archaeological material and allow for the development of a suitable mitigation strategy. Archaeological testing will take place well in advance of construction and under licence to the NMS (DHLGH). Should the anomalies identified in the geophysical survey prove to be archaeological in nature, these and any other archaeological features identified will be resolved in consultation with, and to the satisfaction of, the NMS (DHLGH) and the National Museum of Ireland.
- Where full excavation of archaeological features has been agreed, the archaeologist will be afforded sufficient time and resources to record and remove any such features identified. Archaeological excavation ensures that the removal of any archaeological soils, features, finds and deposits is systematically and accurately recorded, drawn and photographed, providing a paper and digital archive and adding to the archaeological knowledge of a specified area (i.e. preservation by record).
- Accordingly, such recommendations may include preservation by design or in situ. Archaeological testing may also be required to establish the nature, extent, and date of any potential archaeological sites or features that lie within the proposed development site. Testing would also provide a more detailed and clear assessment of the effect that the proposed development would have on archaeological material and allow for the development of a suitable mitigation strategy.

Architectural Heritage

- The proposed development site is located within the former demesne lands of the 18th century Rossana House, a protected structure (RPS 25-14). The historic character of the demesne west of the proposed development site survives largely intact, with parkland, mature specimen trees and areas of woodland.
- The boundary between the surviving parkland and the field in which the proposed development site is located has been present since at least the early 19th century (though modified at its southern end at the time of the motorway construction) and is integral to the setting of the protected structure and the character of its historic grounds. It is proposed to retain the majority of this boundary, with the only affected area being a short section at its southern end, where the proposed site access will be located. The site access will also require removal of part of the southern estate boundary at the R772 road.
- While the planting in this section is relatively new (the estate boundary was altered at the time of the road realignment), any further changes here could negatively affect the historic character of the demesne and thus the setting of the protected structure.
- The Proposed Development will consist of the development of previously undisturbed land within the footprint of the Proposed Development site. Should

any previously unknown features be present in these areas, they would have a higher probability of survival / preservation given the lack of previous construction.

- It is recommended by Courtney Deery Heritage Consultancy Ltd (2023) that the affected section of boundary between the proposed development site and the historic grounds of Rossana House, be replaced in a manner sympathetic to the setting, Whereby, the landscape design for the proposed development should include a boundary treatment designed to enhance the character of the historic demesne that sits adjacent to the proposed Park and Ride site.
- Should any excavations (apart from planting and fencing) be required in the greenfield area then it is anticipated that a condition on grant of permission would require that the developer engage the services of a fully licenced archaeologist to coordinate and undertake the required excavation of identified archaeological features in consultation with the National Monuments Service.

The impact during construction is considered to be ***neutral to negative, not-significant*** and ***short term*** in duration. There are no likely significant effects in terms of the Cultural Heritage Impact during construction, and it would not warrant preparation of an EIA report on these grounds.

5.7.2 Operational Phase

The operational phase of the Proposed Development is not predicted to have any impact on archaeological, architectural and cultural heritage.

5.8 TRAFFIC AND TRANSPORTATION

CSEA has undertaken a traffic and transportation assessment in order to assess the risks of traffic impacts as a result of the Proposed Development. This assessment is included as Appendix F.

5.8.1 Construction Phase

During the construction phase of the Proposed Development, there will be additional traffic movements to/from the site from transportation of site machinery and materials, construction personnel, security staff, professional staff (i.e. design team, utility companies), excavation plant, dumper trucks and deliveries/removal of materials (waste/spoil). It is estimated that on average 10no. staff or less will be working on the site during the construction phase.

The Proposed Development will not generate a significant volume of additional vehicular traffic during construction or operational phases. The level of traffic increase is not likely to have any adverse transport-related environmental effects in terms of noise, air quality, vibrations, etc. The environmental impact of the construction period will be short-term and not significant in nature.

The Traffic and Transportation Assessment confirmed following traffic modelling that there will be multiple potential impacts during the construction phase which include delay and inconvenience to existing traffic on the road network, noise / disturbance to other properties in the vicinity, dust generated or raised from construction traffic, and dirt / mud dragged onto the road by construction traffic.

During the construction phase of the development, the following measures will be put in place to reduce the impact on the surrounding environment:

- The contractor will be required to provide wheel cleaning facilities, and regular cleaning of the R772 West road will be carried out.
- Temporary car parking facilities for the construction workforce will be provided within the site and the surface of the car park will be prepared and finished to a standard sufficient to avoid mud spillage onto adjoining roads.
- Monitoring and control of construction traffic will be ongoing during construction works.

On the basis of the above with regard to the evidence set out within the Traffic and Transportation Assessment the potential effects on Traffic and Transportation are ***short-term***, ***negative*** and ***not significant (moderate)*** for the construction phase. These impacts are not expected to result in significant residual impacts. The cumulative impacts of the construction phase in conjunction with surrounding permitted developments has also been assessed and given the temporary nature of the construction phase, the overall impact is considered ***short-term***, ***negative*** and ***not significant.*** There are no likely significant effects in terms of Traffic and Transportation, and it would not warrant preparation of an EIA report on these grounds.

5.8.2 Operational Phase

The proposed Park and Ride facility site covers a total area of 23,000 sq. meters. It will consist of a new car parking area with 210 car parking spaces (including 13 designated for mobility-impaired users, 21 for electric vehicles (e-car charging spaces) set-down areas and taxi ranks with dedicated access. A new bus standing area is proposed with a dedicated turning circle, 2 new bus bays and 2 passenger shelters. 20 no. bicycle parking Sheffield stands, and 20 no. bike lockers will also be provided within the site to facilitate and cater for cyclists accessing / availing of the facility.

The estimated daily usage of the proposed Park and Ride facility is 204 no. car trips in the year of opening 2025 (based on the demand analysis using ERM conducted by PRDO). The peak hours in the vicinity of the site are determined to be 08:15-09:15 AM and 16:15-17:15 PM, and the overall trips are likely to be concentrated around the peak hours due to the nature of the development's operations. The bus services will include rerouting of the existing services in the nearby area to cater for the Park and Ride facility.

The proposed site is in reasonably close proximity (circa 75 m west of the interchange) to the motorway and will be easily accessed majorly from the N11 via Junction-16 and R772 West Arm. It is proposed to convert the existing site access located on R772 into a standard all-movement priority junction for the Park & Ride facility.

As a part of the proposal, the existing field access on R772 will be upgraded to an all-movement priority junction. The junction will be operational with the proposed Park and Ride Site in 2025. A new 50m long and 3m wide right-turning lane will be built on R772 as part of the proposed junction by realigning the existing eastbound lane towards north to facilitate the local widening. It is anticipated that the Proposed Development will become operational by 2025.

During the operational phase of the development the following measures will be put in place to improve pedestrian and cyclist facilities:

- Internal road markings through the carparks to highlight pedestrian routes.
- 20 no. bicycle parking Sheffield stands, 20 no. bike lockers will be provided within the site to facilitate cyclists wishing to avail this facility.

During the opening year (2025), the Proposed Development will have the following traffic impacts on Junction 16. (Note: The impact of other committed developments has been taken into consideration while performing traffic analysis):

- Overall junction delay on the Western Roundabout (16A) is expected to increase by 1% and 2% respectively during the AM and PM peak hours;
- On the Eastern Roundabout (16B) the junction delay is expected to increase by 1% and 2%; respectively during the AM and PM peak hours;
- Mean max-queues on the R772 West arm of J16-A is expected to increase by 0.1 pcu during the AM peak and 0.2 pcu during the PM peak from the year of opening 2025 (Do Nothing) to the horizon year 2040 (Do Something);
- Mean max-queues on the R772 ramp arm of the western roundabout is expected to increase by 0.2 pcu during the AM peak and 0.1 pcu during the PM peak from the year of opening 2025 to the horizon year 2040. On the eastern roundabout R772 ramp arm, the mean max-queue is expected to increase by 0.1 pcu during the AM peak and 0.2 pcu during the PM peak.

The modelling results obtained shows that the junction will operate at a Level of Service A, with or without this proposed development. While the performance of the junction does become slightly lower, as would be expected with the opening of the proposed development, it should be noted that the impact of the development is minor and that the reduced performance of the junction is for the most part due to background traffic growth.

The Traffic and Transportation Assessment demonstrates that the additional traffic generated as a result of the operational phase can be accommodated within the surrounding road network and will not have an adverse impact.

The operational traffic associated with the surrounding permitted developments has been accounted for in the Traffic and Transport Assessment and therefore the cumulative impact has been accounted for.

On the basis of the above with regard to the evidence set out within the Traffic and Transportation Assessment the potential effects on Traffic and Transportation are ***long-term, neutral*** and ***imperceptible*** for the operational phase. There are no likely significant effects in terms of Traffic and Transportation, and it would not warrant preparation of an EIA report on these grounds.

5.9 MATERIAL ASSETS, AND WASTE

5.9.1 Construction Phase

Utilities: Foul Sewer, Stormwater and Potable Water

Welfare facilities (canteens, toilets etc.) will be required for the construction phase. It is anticipated foul sewage arising from welfare facilities will either be collected by tanker or a temporary connection to the mains network be established. There will be approximately 10 (Peak) of staff required for the construction phase of the Proposed Development.

Measures to contain run-off water containing silt should be detailed in the CEMP, this will include using temporary on-site settlement ponds/tanks/silt busters to ensure adequate silt removal prior to discharge to public drain (if required).

Based on the initial investigation of the Planning Engineering Report, the scheme proposals will have no major impact on these existing utilities.

There are some existing utility ducts and pipes such as a medium pressure gas distribution main, public lighting duct, water main, and sewer main, which are situated within the redline boundary of the scheme. However, after conducting initial investigations, it has been determined that the proposed scheme will not have any significant impact on these existing utilities.

An electricity substation will be constructed as part of the Proposed Development to service the utilities and electric car charging points.

The power and electrical supply requirements during construction are relatively minor, and there is no potential impact anticipated on existing users in the area.

Any excavations and connections will be undertaken with consultation with the utility operators, therefore there is no potential impact anticipated on electrical infrastructure to existing users.

Waste and Waste Management

Project specific resource and waste management targets for the site have not yet been set and this information will be updated for these targets once these targets have been confirmed by the client. However, it is expected for projects of this nature that a minimum of 70% of waste is fully re-used, recycled or recovered where possible.

There will be soil, stones, clay and gravel excavated to facilitate construction of underground services, and the installation of the proposed foundations. The development engineers Clifton Scannell Emerson Associates have estimated that 7,401 m^3 of material will need to be excavated to do so. It is currently envisaged that 1,170 m^3 will be able to be retained and reused onsite for fill, the remaining material, will need to be removed offsite due to the limited opportunities for reuse on site. This will be taken for appropriate offsite reuse, recovery, recycling and / or disposal.

Dedicated bunded storage containers will be provided for hazardous wastes which may arise such as batteries, paints, oils, chemicals etc, if required.

During the construction phase there may be a surplus of building materials, such as timber off-cuts, broken concrete blocks, cladding, plastics, metals and tiles generated. There may also be excess concrete during construction which will need to be disposed of. Plastic and cardboard waste from packaging and supply of materials will also be recycled and disposed of offsite by a licenced waste company.

Other than materials necessary for the construction of the facility, the Proposed Development will not produce significant volumes of waste generated. The contractor will be required to ensure that oversupply of materials is kept to a minimum and opportunities for reuse of suitable materials is maximised.

Waste will also be generated from construction workers e.g. organic / food waste, dry mixed recyclables (waste paper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables and potentially sewage sludge from temporary welfare facilities provided on site during the construction phase. Waste printer / toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated infrequently from site offices.

All waste arising during the construction phase will be managed and disposed of in a way that ensures the provisions of the Waste Management Act 1996 and associated amendments and regulations and the Waste Management Plan. In the event, there is excess material with no defined purpose, it will be transported to an authorised soil recovery site.

Waste during construction will be managed in accordance with a project specific CEMP.

It is considered that the Proposed Development will not have any significant impact in terms of resources or waste generation.

A carefully planned approach to waste management as set out in Section 3.0 and adherence to the Resource Waste Management Plan (RWMP) during the construction phase will ensure that the impact on the environment will be ***short-term, neutral*** and ***imperceptible***.

Conclusion

There are no likely significant environmental effects in terms of the material assets, for the Proposed Development and considering the existing environment and proposed future environment which would warrant preparation of an EIA report.

5.9.2 Operational Phase

Utilities: Foul Sewer, Stormwater and Potable Water

As outlined in the Engineering and Planning Report provided with planning, the existing water infrastructure within the area has been confirmed to have adequate capacity to cater for the Proposed Development.

Water supply will be provided via the existing public mains network adjacent to the site. The disposal of foul water from the site is separated from that of surface water.

The proposed sites foul water demand (peak discharge of 300l/d) will be treated via a Puraflo Wastewater Treatment system of similar.

Water supply will be met from public supply. A PCE was submitted to Uisce Éireann on 31st May 2024 for potable water for the welfare facility of 1 no. staff toilet.

There is no existing foul water infrastructure in the vicinity of the site and so, the proposed 1 no. toilet within the scheme will be treated via a Puraflo Wastewater Treatment System or equivalent.

No industrial-specific wastewater flow will be generated from the development.

There is no predicted impact in respect of foul sewer, stormwater and potable water, that would warrant the preparation of an EIA Report.

The Proposed Development's surface water drainage system was designed in accordance with the Greater Dublin Strategic Drainage Strategy (GDSDS) and consists of the following:

- To comply with the GDSDS guidelines in relation to SUDs, permeable asphalt is proposed in all parking bay areas, including the aisles, to promote infiltration of the storm water into the ground where suitable.
- At locations such as the access road and bus turning area where nonpermeable surfacing is proposed, a series of gullies will convey the runoff to either the raingardens or permeable asphalt areas for infiltration.

There is no predicted impact in respect of foul sewer, stormwater and potable water, that would warrant the preparation of an EIA report.

Waste and Waste Management

The Proposed Development will give rise to minor quantities of waste during the operational phase, i.e. when the project is completed, and fully operational. Given the nature and function / purpose of the development as a carpark and bus stop, the waste generated will be limited / confined to bins strategically provided and dispersed across the site for the users of the Park & Ride facility. The waste generated will be collected and disposed regularly by an assigned waste contractor in the locality. The predicted impact of the operational phase on the environment will be ***long-term, neutral*** and ***imperceptible***.

Conclusion

There are no likely significant environmental effects in terms of the material assets, for the Proposed Development and considering the existing environment and proposed future environment which would warrant preparation of an EIA report.

5.10 ASSESSMENT OF POTENTIAL IMPACTS FROM INTERACTIONS AND CUMULATIVE IMPACTS

Interactions

This section discusses the potential interactions and inter-relationships between the environmental factors discussed in the preceding sections. This section covers both the construction operational and decommissioning phases of the Proposed Development.

In accordance with the guidance, not only are the individual significant impacts required to be considered when assessing the impact of a development on the environment, but so must the interrelationships between these factors be identified and assessed.

The majority of the interactions are considered not to be significant.

In the absence of mitigation, the following potential interaction could exist during construction:

- between land, soil geology, hydrogeology and hydrology if poorly managed surface water is allowed to run-off unmitigated during the construction phase of the Proposed Development.
- between air quality and human health and biodiversity, if dust generated is not managed adequately
- between noise and human health and biodiversity, if construction noise is not managed adequately

However, these are potential short-term interactions associated with the construction phase. In advance of work starting on site, the works contractor will prepare a detailed Construction Environmental Management Plan (CEMP). The measures within the CEMP will ensure that pollution and nuisances arising from site clearance and construction activities are prevented where possible and managed in accordance with best practice and any subsequent planning conditions relevant to the Proposed Development.

It is considered that there will be no likely significant interactions during construction or operation which would warrant preparation of an EIA report.

Cumulative Impacts

As part of the assessment of the Proposed Development, the likelihood of potential cumulative impact of the Proposed Development has been considered with any future development (as far as practically possible) and the cumulative impacts with developments in the locality (including planned and permitted developments).

As outlined in Section 3.2, above, a list of notable consented developments located in close proximity to the development site is included in Appendix A of this report.

Cumulative impacts are those impacts that relate to incremental / additive impacts of the planned development in addition to historical, present or foreseeable future actions. Cumulative impacts can be thought of as occurring through two main pathways: first, through persistent additions or losses of the same materials or resource, and second, through the compounding effects as a result of the coming together of two or more effects.

The Proposed Development will be constructed on an undeveloped site. Mitigation is included in the project design to minimise impacts on the receiving environment.

Existing developments that are already built and in operation contribute to the characterisation of the baseline environment. As such any further environmental impacts that the Proposed Development may have in addition to these already constructed and operational developments has been assessed in the various impact reports and assessments attached to this EIAR screening report.

The following considers the cumulative impacts of the Proposed Development and proposed and permitted and operating facilities in the surrounding area in relation to the receiving environment. Notable developments are included in Appendix A.

Any future development will be required to incorporate appropriate mitigation measures (e.g. noise management, dust management, traffic management, management of water quality in run-off water, landscape, etc) during the construction phase as such any cumulative development will not have a significant effect on human health, material assets, land, soils, geology, hydrogeology, and hydrology.

Any future development proposed on the surrounding lands should be cognisant with the zoning and will be subject to EIA and/or planning conditions which include appropriate mitigation measures to minimise environmental impacts.

Based on the assessment of the environmental sensitivities in the existing environment and consideration of potential cumulative impacts, it is concluded that there are no likely significant cumulative environmental impacts which would warrant preparation of an EIAR.

6.0 FINDINGS AND CONCLUSIONS

The purpose of this EIA Screening Report has been to consider whether there is a requirement for the preparation of an Environmental Impact Assessment Report (EIAR) to accompany the planning application to Wicklow County Council ('WCC') for the Proposed Development.

The Proposed Development and component parts have been considered against the thresholds outlined in Schedule 5, Part 2 Class 10 (a) to (m). The most relevant project type in the context of the Proposed Development is Class 10 (b):

10. Infrastructure projects

(b) (ii) Construction of a car-park providing more than 400 spaces, other than a car-park provided as part of, and incidental to the primary purpose of, a development.

The Proposed Development site is a carpark with 210 car parking spaces. The Proposed Development site is not equal to nor does it exceed the limit, quantity or threshold set out in Class 10 (b); therefore, an EIA is not mandatory.

In addition, the development does not entail an extension or change to any existing EIA project (i.e. Class 13).

On the basis of the evaluation set out in Section 2.0 of this document, an EIA for the Proposed Development is not mandatory; the Proposed Development is considered to be a sub-threshold development and therefore there is discretion over the submission of an EIAR with the planning application.

AWN has considered the Proposed Development and assessed the potential for significant environmental effects and the need for an EIAR on a discretionary basis; this evaluation is documented in Sections 3.0, 4.0 and 5.0 and is summarised below:

- The Appropriate Assessment Screening (Appendix B) concludes that an Appropriate Assessment (stage II) is not required. It is considered that the Proposed Development alone or in combination with other developments will have no likelihood of direct or indirect effects on European sites in view of their conservation objectives.
- The Options Assessment (Biodiversity) concludes there were no rare or protected habitats or species recorded on the site. A baseline review of biodiversity at the site was carried out by the project ecologists Doherty Environmental. No invasive species (e.g. Japanese Knotweed) was detected to be present occupying the site; The project site is not located within any designated conservation area. The nearest designated conservation area is the Murrough Wetlands SAC, SPA and pNHA, located circa 1.5km to the east overland. All other European Sites are located at greater distance from the project site. The examination based on the source-pathway-receptor model found that no pathways connect the project site to the any European Sites occurring in the wider area surrounding the project site and there will be no potential for the project to interact with them or their qualifying features of interest/special conservation interests. Given the absence of any pathways and any European Sites within the zone of influence of the project, there will be no potential for the project to combine with other plans, projects or existing pressures to result in cumulative adverse effects to European Sites in the wider surrounding area. Stormwater discharges during operation are to ground via permeable asphalt and rain gardens, while there is no existing foul water

infrastructure in the vicinity of the site and so, the proposed 1No toilet within the scheme will be treated via a Puraflo Wastewater Treatment System or equivalent. No industrial-specific wastewater flow will be generated from the development.

- Best practice measures are included in the design and CEMP to negate any off-site impact on birds and bats. The Proposed Development is predicted to have a neutral imperceptible effect on biodiversity.
- A detailed Air Quality Impact Assessment Report (Appendix D) was completed to assess the impact of the development with reference to the protection of the environment and human health. This report concludes, on conservative assumptions, that the Proposed Development will not result in any off-site exceedances of the applicable ambient air quality standards (including at the nearest residential receptors).
- The Noise and Vibration Impact Assessment Report (Appendix C) has assessed the potential noise impact of the development and concludes that the Proposed Development, will comply with the relevant noise criteria at noise sensitive locations (including at the nearest residential receptors).
- The Cultural Heritage Imapct Assessment Report (Appendix H) concludes that there are no recorded archaeological sites or monuments within the Proposed Development lands, as listed in the Record of Monuments and Places for Co. Wicklow. However, due to previous findings in the immediate vicinity / adjacent lands (M11 excavation) and given the high archaeological potential of the proposed development site, a geophysical survey has been carried out on site. Based on the results of this survey, archaeological test-trenching has been recommended. This will take place in advance of construction and under licence to the National Monuments Service.
- The Traffic and Transportation Assessment (Appendix F) concludes that the Proposed Development (construction and operation) will not have a significant impact upon the established local traffic conditions with all junctions within the study area. Traffic generated as a result of the operational phase can be accommodated within the surrounding road network and will not have an adverse impact.
- The Soils Geology and Water assessment discussed in this report concludes that underlying bedrock, groundwater and local water courses will not be impacted. During operation stormwater drainage will consist of permeable asphalt and rain gardens (and gulleys to convey flow). Measures to contain potential contamination sources during construction will be detailed in a CEMP during construction. There is no likely impact on the receiving environment.
- The Resource Waste Management Plan (Appendix G) concluded that other than materials necessary for the construction of the building the Proposed Development will not produce significant volumes of waste. Waste during construction will be managed in accordance with a project specific Construction Waste Management Plan.
- The Landscape and Visual Impact Assessment (Appendix I) concludes that the predicted impact on landscape and visual impact during operation is neutral, slight and Imperceptible. There are no likely significant effects in terms of the Landscape and Visual Impact during construction or operation that would warrant preparation of an EIA.
- The preparation of, and compliance with, a Construction Environmental Management Plan (CEMP) by the construction contractor prior to commencement will address potential short-term nuisances (such as dust and noise etc.) and risks from the storage of any hazardous substances (fuels, chemicals and other construction materials that may pose a risk to the

environment) are avoided and minimised. The CEMP will ensure potential nuisances during the construction of the facility are avoided and minimised.

AWN has concluded, there are no likely significant environmental effects on the receiving environment for the Proposed Development, which would warrant preparation of an EIA.

A mandatory EIA is not required for the Proposed Development, and as the potential effects are not significant it is submitted by AWN that there is not a requirement for an EIAR to be submitted with this planning application.

7.0 REFERENCES

- Environment Protection Agency. Guidelines on the Information to be contained in Environmental Impact Assessment Reports. EPA: 2022
- Planning and Development Regulations, 2001 as amended.
- CSEA, Planning Engineering Report:M11-J16 (Ashford) Park & Ride, (Updated December 2023).
- NTA Park and Ride Development Office , Flood Report, January 2023.
- EPA (2024). EPA Maps.
- GSI (2024). GSI Map Viewer.
- Institute of Geologists of Ireland (2013). Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements.
- NPWS (2024). Designations Viewer.
- NRA (2009). Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.
- OPW (2024). Flood Maps.
- OPW (2009). The Planning System and Flood Risk Management: Guidelines for Planning Authorities.
- Teagasc (2024). Teagasc Map Viewer.
- National Roads Authority (NRA) (2009). Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.
- Wicklow County Development Plan (2022-2028).

APPENDIX A

Relevant Planning History

Planning Reference, Applicant & Location	Development Description	Decision & Decision Date
Planning Ref: 211170 Ger Byrne Rossana Upper, Ashford, Co. Wicklow	Construction of 4 detached dwellings with garages, new entrance onto public road, new internal road and footpath, connection to public water supply, wastewater treatment units and polishing filters for each dwelling, removal of existing septic tank on site and installation of new wastewater treatment unit and polishing filter for dwelling served by existing septic tank, demolition of existing shed and associate works.	GRANT PERMISSION 27/07/2022
Planning Ref: 211195 Karla Clarke Rossana Lower, Newrath, Rathnew, Co. Wicklow	90 no. residential units (64 no. houses and 26 no. duplexes) and childcare facility of 196 sq.m together with all associated site development works including estate roads, footpaths, car parking, bins & bicycle storage, boundary treatment, services infrastructure including water mains, foul sewerage, surface water sewerage and on-site attenuation tanks. The proposed development includes for measures to upgrade and realign the Newcastle Road (R761) which will provide for turning lanes at the entrance to the proposed development and Wicklow County Campus (Clermont) and new uncontrolled pedestrian crossing. A sloped landscaped area located between the existing Clermont demesne wall and the new road realignment is proposed, and a partial demolition of Clermont demesne wall to facilitate the proposed realignment. A new two-way shared pedestrian / cyclist path is proposed along the western side of the proposed realignment from the site entrance to the roundabout junction at the Rathnew Relief road. A new surface water open drain is proposed from the proposed development along the western side of the proposed new public footpath / cycle lane which is then piped further south under the proposed realigned Newcastle Road (R761) to connect into the existing surface water main near the roundabout junction along the Rathnew Relief Road. Water main and foul sewerage connections are proposed into the existing public mains in the vicinity. The proposed foul sewerage will be piped under the Newcastle Road (R761) up to the existing pubic sewer on Tighe Avenue (R772)	GRANT PERMISSION 23/06/2022
Planning Ref: 23854 Rycroft RW Limited Site at Rossana Lower and Newrath, Rathnew, Co. Wicklow	proposed 80 No. residential units (64 No. houses and 16 No. duplexes) and childcare facility of 196 sq.m together with all associated site development works including estate roads, footpaths, car parking, bins and storage, boundary treatment, services infrastructure including watermains, foul sewerage, surface water sewerage and on-site attenuation tanks. The proposed development includes for measures to upgrade and realign the Newcastle Road (R761) which will provide for turning lanes at the entrance to the proposed development and Wicklow County Campus (Clermont) and a new uncontrolled pedestrian crossing. A sloped landscaped area located between the existing Clermont demesne wall and the new road realignment is proposed, and a partial demolition of Clermont demesne wall to facilitate the proposed realignment. A new two-way shared pedestrian/ cyclist path is proposed along the western side of the proposed realignment from the site entrance to the roundabout junction at the Rathnew Relief Road. A new surface water open drain is proposed from the proposed development along the western side of the proposed new public footpath/ cycle lane which is then piped further south under the proposed realignment Newcastle Road (R761), and out onto Tighe avenue (R772) where it will drain further south to an existing surface water manhole on Main Street. Watermain and foul sewerage connections are proposed into the existing public mains in the vicinity. The proposed foul sewerage will be piped under the Newcastle Road (R761) up to the existing public sewer on Tighe Avenue (R772)	GRANT PERMISSION 29/02/2024

Planning Reference, Applicant & Location	Development Description	Decision & Decision Date
Planning Ref: 2360219 Keldrum Limited Site of c.16.8ha, at Tinakilly, Rathnew, Co. Wicklow	LARGE SCALE RESIDENTIAL DEVELOPMENT - (a)Construction of 352 no. residential units (b) The proposed development will connect to the Tinakilly Park residential development and Rathnew Village via a new section of the Rathnew Inner Relief Road. The proposed road will join the constructed/under construction elements permitted under WCC Ref. 17/219/ ABP Ref. PL27.301261 and amended under WCC Ref. 22/837 to the south with a section of the link road to the northwest of the site at the R761 roundabout in Rathnew granted under WCC Ref. 21/1333. This includes all associated vehicular and pedestrian access, carriageways, paths and junctions. (c) No proposed works to Tinakilly Country House Hotel (a protected structure Reference No. 25-15) save for works to close the western portion of Tinakilly avenue to vehicular traffic and the provision of a new vehicular entrance and gates along the eastern portion of Tinakilly Avenue off the Rathnew Inner Relief Road to facilitate access to Tinakilly House and other properties to the east of the site accessed from Tinakilly Avenue. (d) All associated site development works, service provision, infrastructural and drainage works, provision of esb substations, bin stores, bicycle stores, car parking, public lighting, landscaping, open space, and boundary treatment works. (e) The planning application is accompanies by an Environmental Impact Assessment Report and Natura Impact Statement. The application site is generally bounded to the north by greenfield lands, to the east by Tinakilly Country House Hotel (which is a Protected Structure RPS No. 25-15), to the west/southwest by commercial development, the R750 Wicklow – Rathnew Road and Rathnew Village; and to the south by the Tinakilly Park residential development currently under construction.	GRANT PERMISSION 02/02/2024
Planning Ref: 21558 Rathnew Business Park Ltd South Point Business Park / Harris Site	10,133 sqm of light industrial /warehouse units in six blocks, with all associated infrastructure and site works. The blocks range in area from 513 sqm to 3490 sqm, subdivided into units from 218 sqm to 595 sqm and are 9.3m high. This application is for a permission of 10 years duration	GRANT PERMISSION 20/10/2021
Planning Ref: 20502 Knoxpark Developments Ltd. St Ernan's National School	demolition of the existing school building and prefabricated classrooms, the construction of 18 no semi detached and terraced houses consisting of 2 no type A 3 bed houses, 8 no type B 3 bed houses and 8 no type C 3 bed houses, provision of roads, turning areas, car parking spaces, public open spaces, landscaping, connect to all existing public services and include all ancillary site works	GRANT PERMISSION 23/11/2020

Planning Reference, Applicant & Location	Development Description	Decision & Decision Date
Planning Ref: 221144 Cedarbrick Ltd. Land located to the East of Mount Alto Road, Ashford, Co. Wicklow	4 no., 4 bedroom detached dwellings ranging in size from c.174sqm-c.189sqm each with private rear gardens and patios. The split level dwellings are arranged across 1-2 storeys with single storey frontage to Mount Alto Road (west) and two storey frontage to Mount Usher View (east). Proposed vehicular access from Mount Alto Road with associated internal road and footpath. The available public amenity area is c.0.135ha with a usable public open space of c.0.05ha. All associated site development works, services provision including a bio-retention system and connection to water services to the west on Mount Alto Road and to the east via Mount Usher View residential estate and further east onto the R772 road, 10 no. car parking spaces including 2 no. visitor spaces, external stores and bin stores, lighting, roof mounted solar panels, open space, landscaping and boundary treatment works	GRANT PERMISSION 16/12/2022
Planning Ref: 2460516 O Neill Electrical & Michelle Esmonde Lands located off Ballymacahara Road, Ashford, Co Wicklow	1. Construction of 4 No. Dwellings comprising 226.8 sq.m. each, split level arranged over 1-3 storeys. 2. Access to each dwelling directly off existing Ballymacahara Road (L5095 Public Road). 3. Connection to all public services via existing housing development. 4. All necessary ancillary works to facilitate this development	DECISION PENDING Decision due 20/10/2024
Planning Ref: 20191 Ashford GAA Club Lands located off Ballymacahara Road, Ashford, Co Wicklow	importation of topsoil and subsoil for the purposes of creating a spectator viewing embankment to the north of the main playing pitch and the provision of an underage training area to the west of the grounds	GRANT PERMISSION 24/08/2020
Planning Ref: 21690 Mezen Consultancy Services Ltd Tinakilly Upper, Rathnew, Co. Wicklow	conversion of existing agricultural building for use as a micro distillery facility with visitor tasting and viewing areas together with new toilet facilities, connection to existing services and ancillary site works	GRANT PERMISSION 17/01/2022

Planning Reference, Applicant & Location	Development Description	Decision & Decision Date
Planning Ref: 19208 Mezen Consultancy Services Ltd Tinakilly House Hotel, Tinakilly, Rathnew, Co. Wicklow	10 bell tents each of which are situated upon timber deck bases, in addition to two toilet blocks which are connection to public sewer system, providing individual facilities for each tent and all necessary ancillary works to facilitate the development	GRANT PERMISSION 29/10/2019
Planning Ref: 2460333 Mezen Consultancy Services Ltd Knockrobin Glamping, Tinakilly House Hotel, Tinakilly, Rathnew, Co. Wicklow	10 glamping sites with timber-framed pod structures, provision of car parking, connection to services and all necessary ancillary works and services to facilitate this development	GRANT PERMISSION 31/07/2024
Planning Ref: 2237 Broomhall Estates Ltd Broomhall Townland, Rathnew, Co Wicklow	housing development of 93 dwelling units consisting of 18 duplex units, 44 semi detached dwellings, 25 terraced dwellings, 4 apartments, 2 detached dwellings, and a creche, with connection to services and all associated works including roads, footpaths, boundaries and boundary treatments, public lighting, open spaces and landscaping, attenuation system and new entrance from Saunders Lane Road, and relocation of attenuation system previously granted under ref. no 18/50 to be located on these lands	GRANT PERMISSION 04/07/2022

APPENDIX B

Appropriate Assessment Screening Report

Ashford Park & Ride

Ashford, Co. Wicklow

Screening Report for Appropriate Assessment

Doherty Environmental Consultants Ltd.

Oct. 2024

Ashford Park & Ride

N11, Ashford, Co. Wicklow

Screening Report for Appropriate Assessment

Document Stage	Document Version	Prepared by
Final	1	Pat Doherty MSc, MCIEEM

Table of Contents

1.0 INTRODUCTION

Doherty Environmental Consultants (DEC) Ltd. has been commissioned by CSEA Consulting Engineers on behalf of the NTA to undertake a Screening Report in support of an Appropriate Assessment (AA), under Article 6 of the EU Habitats Directive, for a proposed Park and Ride development at Ashford, N11, Co. Wicklow. The location of the proposed site is shown on Figure 1.1 while an aerial view of the proposed site is shown on Figure 1.2. The proposed development layout is provided as Appendix 1.

This Screening Report for Appropriate Assessment forms Stage 1 of the Habitats Directive Assessment process and is being undertaken in order to comply with the requirements of the Habitats Directive Article 6(3). The function of this Screening Report is to identify the potential for the project to result in likely significant effects to European Sites and to provide information so that the competent authority can determine whether a Stage 2 Appropriate Assessment is required for the project.

1.1 LEGISLATIVE CONTEXT

Legislative protection for habitats and species is provided within the European Union by the Habitats Directive. The Habitats Directive has been implemented in Ireland and throughout Europe through the establishment of a network of designated conservation areas known as the Natura 2000 (N2K) network. The N2K network includes sites designated as Special Areas of Conservation (SACs), under the EU Habitats Directive and Special Protection Areas (SPAs) designated under the EU Birds Directive 2009/147/EC (as amended). SACs are designated in areas that support habitats listed on Annex I and/or species listed on Annex II of the Habitats Directive. SPAs are designated in areas that support: 1% or more of the all-Ireland population of bird species listed on Annex I of the EU Birds Directive; 1% or more of the population of a migratory species; and more than 20,000 waterfowl.

This Screening Report for Appropriate Assessment is being prepared in order to enable the competent authority to comply with Article 6(3) of Council Directive 92/43/EEC (The Habitats Directive). It is prepared to assess whether or not the project alone or in combination with other plans and projects is likely to have a significant effect on any European Site in view of best scientific knowledge and in view of the conservation objectives of the European Sites and specifically on the habitats and species for which the sites have been designated. Measures

intended to avoid or reduce the harmful effects of the proposed project on European sites (i.e. "mitigation measures") have not been taken into account in this screening stage appraisal of the project. It is noted that, as per the EC (2021) Guidelines, design and generic measures can be taken into account at the screening stage. Furthermore it is noted that European legal precedent[1] has established that account may be taken of features of a project which involve the removal of contaminants and which therefore may have the effect of reducing the harmful effects of the project on a European Site, where those features have been incorporated into that project as standard features, inherent in such a project, irrespective of any effect on the site.

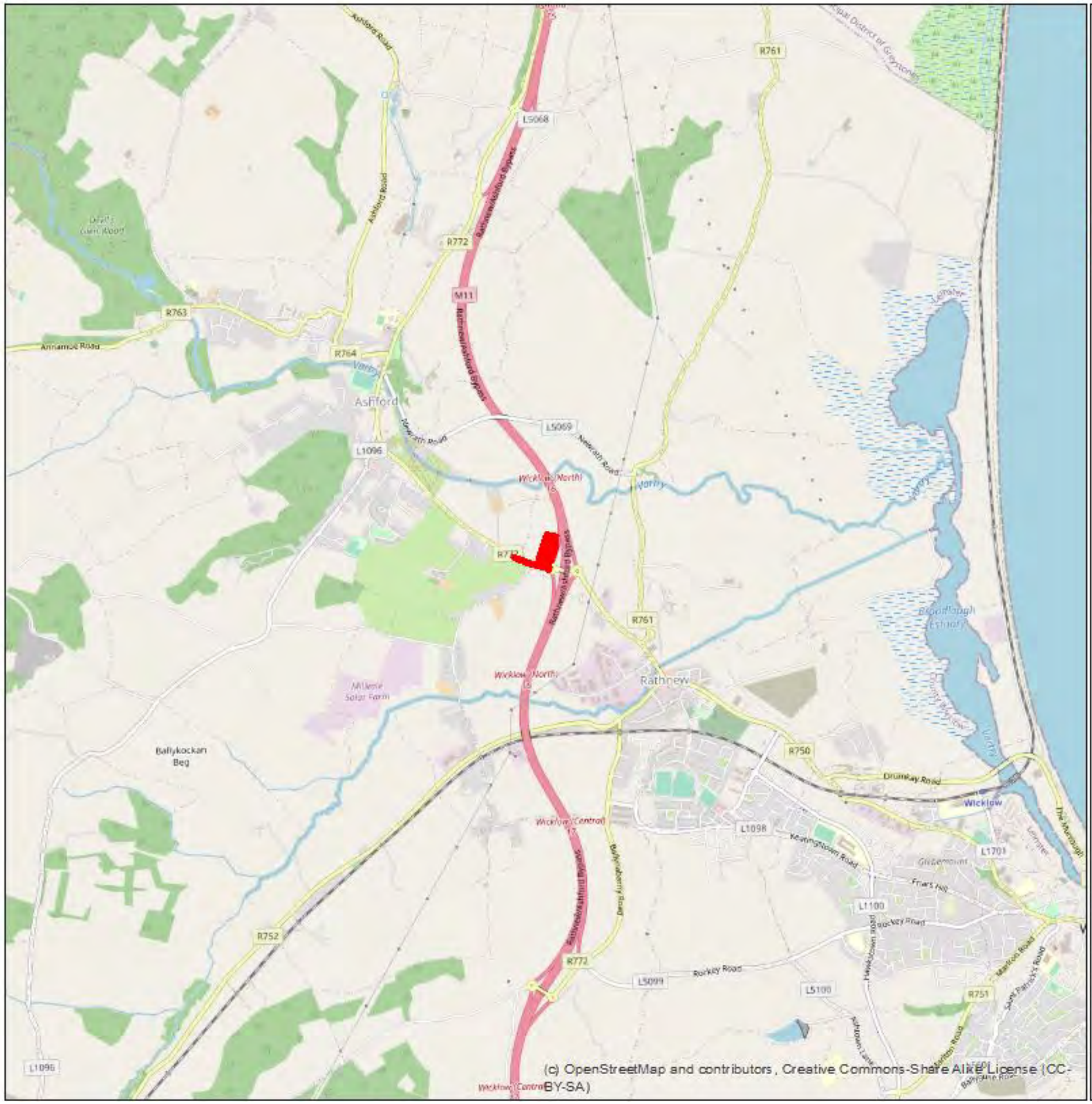
1.1.1 Requirement for an Assessment under Article 6 of the Habitats Directive

According to section 177U(1) of the Planning and Development Act 2000 (as amended) the competent authority has a duty to:

- Determine whether the proposed Project is directly connected to or necessary for the management of one of more European Sites; and, if not,
- Determine if the Project, either individually or in combination with other plans or projects, would be likely to have a significant effect on the European Site(s) in view of best scientific knowledge and the Conservation Objectives of the site(s).

This report contains information to support a Screening for Appropriate Assessment and is intended to provide information that assists the competent authority when assessing and addressing all issues regarding the construction, operation and decommissioning of the Project and to allow the competent authority to comply with the Habitats Directive. Article 6(3) of the Habitats Directive defines the requirements for assessment of projects and plans for which likely significant effects on European Sites may arise. The Birds Directive and the Habitats

[1] ECJ Judgement C-721/21 of the 15th June 2023



Ashford Rathnew Park & Ride

Figure 1.1

Site Location

Site Boundary

0 0.25 0.5 1 Km

N W E S

Drawn By	PD
Date	02/08/2023
Data Source	OSM

Ashford Rathnew Park & Ride

Figure 1.2

Aerial View of the Project Site

Site Boundary

0 0.0125 0.025 0.05 Km

N W E S

Drawn By	PD
Date	29/02/2024
Data Source	Bing

Directive together list habitats and species that are of international importance for conservation and require protection. The Habitats Directive requires competent authorities, to carry out a Screening for Appropriate Assessment of plans and projects that are not directly connected to or necessary for the management of a European Site, to assess whether the plan or project alone or in combination with other plans or projects, would be likely to have significant effects on European Sites in view of best scientific knowledge and the Site's conservation objectives. This requirement is transposed into Irish Law by, inter alia, Part XAB of the Planning and Development Act, 2000 (as amended). Section 177U(4) of Part XAB of the Planning and Development Act states:

"The competent authority shall determine that an appropriate assessment of a draft Land use plan or a proposed development, as the case may be, is required if it cannot be excluded, on the basis of objective information, that the draft Land use plan or proposed development, individually or in combination with other plans or projects, will have a significant effect on a European site. "

1.2 SCREENING METHODOLOGY

This Screening Report has been prepared in order to comply with the legislative requirements outlined in Section 1.1 above and aims to establish whether or not the proposed project, alone or in combination with other plans or projects, would be likely to have significant effects on European Sites in view of best scientific knowledge and the Site's conservation objectives. In this context "likely" means a risk or possibility of effects occurring that **cannot** be ruled out based on objective information and "significant" means an effect that would undermine the conservation objectives of the European sites, either alone or in-combination with other plans and projects (Office of the Planning Regulator (OPR), 2021) .

The nature of the likely interactions between the Plan and the Conservation Objectives of European Sites will depend upon the:

- the ecological characteristics of the species or habitat, including their structure, function, conservation status and sensitivity to change; *and/or*

- the character, magnitude, duration, consequences and probability of the impacts arising from land use activities associated with the plan, in combination with other plans and projects.

This Screening Report for Appropriate Assessment has been undertaken in accordance with respective National and European guidance documents: Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities (DEHLG 2010); *Assessment of Plans and Projects Significantly Affecting Natura 2000 sites – Methodological Guidance of the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC;* and *Office of the Planning Regulator – OPR Practice Note PN01: Appropriate Assessment Screening for Development Management* (2021), and recent European and National case law. The guidance document *Managing Natura 2000 Sites – The provisions of Article 6 of the Habitats Directive 92/43/EEC. European Commission (2018)* was also of relevance during the preparation of this Screening Report.

The EC (2021) guidelines outline the stages involved in undertaking a Screening Report for Appropriate Assessment for projects. The methodology adopted during the preparation of this Screening Report is informed by these guidelines and was undertaken in the following stages:

1. Describe the project and determine whether it is necessary for the conservation management of European Sites;
2. Identify European Sites that could be influenced by the project;
3. Where European Sites are identified as occurring within the zone of influence of the project identify potential effects arising from the project and screen the potential for such effects to negatively affect European Sites identified under Point 2 above; and
4. Identify other plans or projects that, in combination with the project, have the potential to affect European Sites.

1.3 SCIENTIFIC INVESTIGATIONS

Scientific investigations undertaken to inform this screening report for Appropriate Assessment include desk-based review and analysis and on-site field surveys. Desk-based investigations were completed to identify pathways connecting the proposed development to European Sites. Datasets used to assist with the desk-based investigations include:

- NPWS European Sites and site-specific conservation objectives datasets;
- EPA Rivers and Lakes dataset;
- EPA surface water catchment and sub-catchment datasets
- NPWS Article 17 Habitats and Species datasets;
- OSI Geohive and OSI Historic townlands online mapping portal; and
- National Biodiversity Data Centre (NBDC) online mapping portal.
- National Biodiversity Data Centre (NBDC) Species Dataset for the project site surrounding area.

The ecological field surveys that have been completed include:

Habitats and vegetation surveys and mapping at the proposed development site;

Ornithological surveys which included breeding season and non-breeding season bird surveys completed during August, September and October 2022; March 2024 & October 2024. The breeding season surveys followed Countryside Bird Survey (CBS) transect methods. The non-breeding season were completed at high tide time to coincide with the time of day wetland bird species are most likely to be present on terrestrial habitats. Any wetland bird observed on the site during the non-breeding season surveys were identified to species level and the number of each present was recorded; and

Non-volant mammals surveys of the project site.

2.0 PROJECT DESCRIPTION

The proposed development will consist of:

- A new car parking area with a total of 210 car parking spaces, including 13 no. mobility impaired parking spaces and 21 no. e-car charging spaces.
- New bus standing area with a dedicated turning circle, 2 new bus bays and 2 passenger shelters.
- New set-down areas and taxi ranks with dedicated access.
- Hardstanding area for bike shelter and lockers.

The Proposed Layout of the Park & Ride facility is detailed in drawing: 20_008L - CSE - GEN - XX - DR - C – 2200, provided under separate cover with the planning application documentation. The proposed layout is reproduced as Appendix 1 below.

The proposed bus turning circle will be 7 metres wide and 60 metres long, sufficient in length to safely accommodate 2 coaches. The proposed facility will also include 2 bus shelters as part of the bus stop stand area.

The parking area can be accessed at the northern end of the proposed site from the new internal access road. A separate egress point will be located at the southwest edge of the car park, circa 40m north of the new access junction.

2.1 PROPOSED SURFACE WATER DRAINAGE

To comply with the GDSDS guidelines in relation to SUDs, permeable asphalt is proposed in all parking bay areas, including the aisles, to promote infiltration of the storm water into the ground. At locations such as the access road and bus turning area where non-permeable surfacing is proposed, a series of gullies will convey the runoff to either the raingardens or permeable asphalt areas for infiltration.

2.2 WASTEWATER

There is no existing foul water infrastructure in the vicinity of the site and so, the proposed 1 No. toilet within the scheme will be treated via a Puraflo Wastewater Treatment System or equivalent.

No industrial-specific wastewater flow will be generated from the development.

For further details, please refer to drawing 20_008L-CSE-GEN-XX-DR-C-2510.

2.3 GENERATED FROM THE DEVELOPMENT.UTILITY CONNECTIONS

There are some existing utility ducts and pipes such as a medium pressure gas distribution main, public lighting duct, water main, and sewer main, which are situated within the redline boundary of the scheme. However, after conducting our initial investigation, it has been determined that the proposed scheme will not have any significant impact on these existing utilities.

2.4 CONSTRUCTION PHASE

The construction of the proposed development will be carried out in the following phases:

- Site clearance and removal of footing bases and underground services where required
- Excavation of site to formation level
- Construction of the foundations
- External works, roads & footpaths

2.4.1 Construction Phase Surface Water Management

During the construction phase surface water runoff will be to ground as per the existing surface water runoff regime at the project site.

During periods of high rainfall when precipitation exceeds infiltration surface water runoff will flow to the east following the natural fall in topography to the east.

Any groundwater ingress to excavations will be pumped to a construction phase treatment train that will comprise a mobile attenuation tank and buffered outfalls over vegetated ground to the east of the project site.

If surface water discharge to the existing stormwater drain is required during construction temporary on-site settlement ponds/tanks/silt busters will be installed to ensure adequate silt removal prior to discharge the detail of this system will be presented in the CEMP.

A silt fence will be provided along the eastern boundary of the construction phase to retain any fines entrained within the surface water runoff. The outfall of the buffered outfalls will be situated to the west of the silt fence.

2.4.2 Construction & Environmental Management Plan

A Construction & Environmental Management Plan (CEMP) will be prepared for the proposed development and provided to the planning authority prior to the commencement of construction.

2.4.2.1 Resource Waste Management Plan

The Resource Waste Management Plan (RWMP) provides a Waste Management Plan for the proposed development. It is anticipated that all excavated topsoil (6,231m^3) and 1,170 m^3 of subsoil will be reused on site. It is anticipated that all of the excavated topsoil material will need to be removed offsite for appropriate reuse, recovery and/or disposal. It is currently envisaged that 1,170m3 will be able to be retained and reused onsite for fill. Soils for disposal from the site are classified as waste and must comply with waste management legislation. The relevant legislation is the EU council decision (2003/33/EC) which has been implemented in all member states and sets out the criteria for the acceptance of waste at Landfills.

Final certification for all materials removed off site will require to be provided by the main contractor on completion of the excavation works.

2.4.3 Construction Plant, Equipment & Materials

The following construction materials will be required for the works:

- Concrete: This will be delivered by bottle truck and placed directly in prepared forms.
- Hardcore: This will be stored in the Construction compounds and delivered to site location by dump truck.

- The materials and equipment to be stored in the construction compound will be provided in the CEMP to be submitted prior to the commencement of construction

3.0 DESCRIPTION OF THE SITE LOCATION

The proposed Park & Ride facility is located west of Junction 16 of the M11 motorway in the townland of Rosanna Lower, approximately 1km to the northwest of the town of Rathnew and 1km southeast of the town of Ashford. The site is reasonably close (circa 250m) to the motorway and is easily accessible from the N11 via Junction-6 and the existing dual carriageway road. the project site is representative of a brownfield site that is currently being actively used as a depot for the storage of construction material and equipment.

3.1 SOILS & GEOLOGY

The project site is underlain by dark blue-grey slate, phyllite & schist of the Maudlin Formation. The quaternary subsoils consist of Irish Sea Till derived from Cambrian sandstones and shales. The underlying soils consist of mineral poorly drained and mainly acidic soils.

3.2 HYDROLOGY & HYDROGEOLOGY

The project site is located within the Vartry_SC_010 surface water sub-catchment of Vartry surface water catchment. There are no watercourses flowing through or bounding the project site. The nearest watercourse to the project site is the Vartry River approximately 160m to the north. The Cronroe Stream is located approximately 200m to the south. Figure 3.1 shows the location of these watercourse with respect to the project site. There are no artificial drainage ditches draining the site. Both the Cronroe Stream and the Vartry River flow east and discharge into the Murrough Wetlands SAC & SPA.

This Site Option is located within the Wicklow Groundwater Body IE_EA_G_076. The groundwater recharge zone in which the project site is located is shown on Figure 3.2. The project site is located within an area of low subsoil permeability and low groundwater vulnerability.

The project will not be connected to the Cronroe Stream or any other surface waterbody. The project has been designed such that surface water generated on the car park surface will drain to ground via permeable asphalt and raingardens where it will be attenuated and drain to ground. It is not proposed to direct any surface water runoff from the project site to the Cronroe Stream or any other surface waterbodies.

3.3 BIODIVERSITY

3.3.1 Designated Conservation Areas

The project site is not located within any designated conservation area. The nearest designated conservation area is the Murrough Wetlands SAC, SPA and pNHA, located approximately 1.8km to the east overland. The location of the Murrough Wetlands SAC & SPA (henceforth jointly referred to as the Murrough Wetlands European Sites) with respect to the project site is shown on Figure 3.1.

All other SACs and SPAs occurring in the wider area surrounding the project site are located at a remote distance from this site and are not connected to it via potential impact pathways.

The project site is not located within a Natural Heritage Area (NHA) or proposed Natural Heritage Area (pNHA). There are no NHAs occurring downstream of this site option or in the wider area surrounding the project site.

3.3.2 Habitats

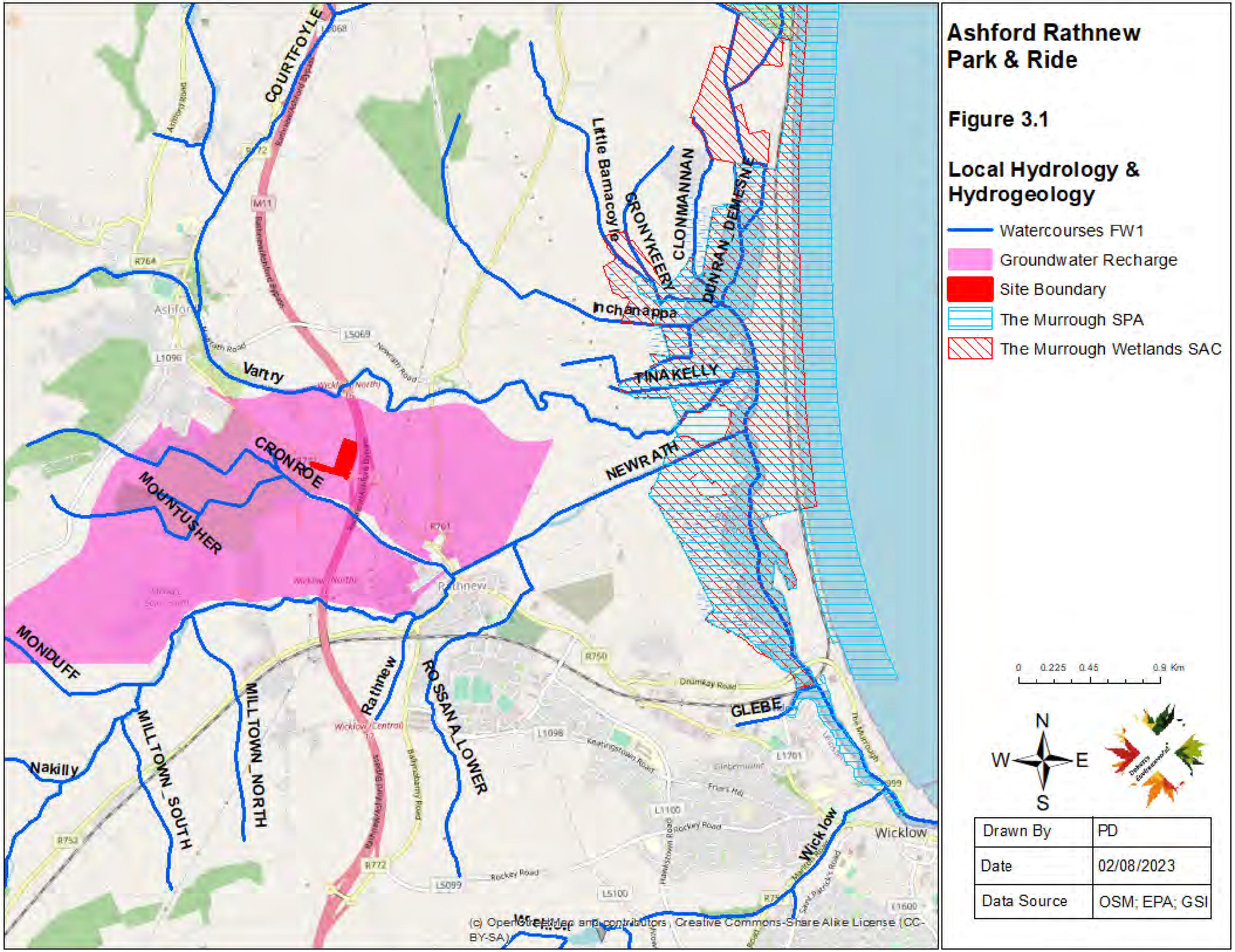
The habitats occurring at project site are dominated by improved agricultural grassland. Artificial surfaces in the form of existing roads surround the project site to the south and east. Hedgerows (WL1) occur along the southern and eastern boundaries of the project site.

A review of historical aerial imagery from 1995 indicates that the project site was previously used for agricultural purposes as a pasture field (GA1) and was part of a larger pasture at this time. The field was severed by the M11. The 1995 imagery shows the field boundary hedgerow and treelines occurring to the west of the Site Option that terminates at the R722. The 2000 aerial imagery does not indicate any apparent change in land cover and habitats between 1995 and 2000. The 2005 imagery depicts a change to land cover immediate to the east of project site with the presence of the newly constructed and operational M11 motorway.

Imagery from 2011 – 2013 depicts the current land cover and habitats at project site.

The 25-inch and 6-inch historical mapping for the lands at and surrounding project site suggest that these lands were enclosed at these times presumably for agricultural pasture.

The distribution of current habitats at the project site are shown on Figure 3.2.

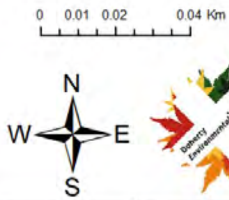

Ashford Rathnew Park & Ride
Figure 3.1
Local Hydrology & Hydrogeology
Watercourses FW1
Groundwater Recharge
Site Boundary
The Murrough SPA
The Murrough Wetlands SAC
0 0.225 0.45 0.9 Km
N
W
E
S
Drawn By PD
Date 02/08/2023
Data Source OSM; EPA; GSI
COURTFOYLE
Little Barnacoyle
CRONYKEERY
CLONMANNAN
DUNRAN_DEMESNE
Inchanappa
TINAKELLY
Vartry
CRONROE
MOUNTUSHER
NEWRATH
MONDUFF
Nakilly
MILLTOWN_SOUTH
MILLTOWN_NORTH
Rathnew
ROSSANA_LOWER
GLEBE
Wicklow
(c) OpenStreetMap and contributors, Creative Commons-Share Alike License (CC-BY-SA)

Ashford Rathnew Park & Ride

Figure 3.2

Habitat Map

- Site Boundary
- Hedgerows WL1
- Improved Agricultural Grassland GA1
- Buildings Artificial Surfaces BL3



Drawn By	PD
Date	29/02/2024
Data Source	Bing

3.3.3 Fauna

No breeding or resting sites for non-volant mammals occur within or bounding the project site. The project site supports a range of commonly occurring bird species.

No non-volant mammals were recorded as present at the project site during baseline surveys.

Bat activity was also recorded at the project site during baseline bat surveys.

4.0 IS THE PROJECT NECESSARY FOR THE CONSERVATION MANAGEMENT OF EUROPEAN SITES

The project has been described in Section 2 of the Screening Report and it is clear from the description provided that the project is not directly connected with or necessary for the future conservation management of any European Sites.

5.0 IDENTIFICATION OF EUROPEAN SITES WITHIN THE ZONE OF INFLUENCE OF THE PROJECT

Current guidance (OPR, 2021) informing the approach to screening for Appropriate Assessment defines the zone of influence of a proposed development as the geographical area over which it could affect the receiving environment in a way that could have significant effects on the Qualifying Interests of a European site. It is recommended that this is established on a case-by-case basis. For projects that are located within or immediately adjacent to European Sites, the relevant European Site should be automatically selected for consideration in the screening exercise. For European Sites located further afield it is recommended that a Source-Pathway-Receptor (SPR) framework is used to established whether or not European Sites occur within the zone of influence of the project (OPR, 2021).

In order to identify the European Sites that could be located within the zone of influence, the current digital mapping (shapefile) of European Sites in Ireland[2], as published by the NPWS, was reviewed to identify the European Sites that could conceivably be connected to the project site via pathways.

All European Sites occurring in the wider surrounding area were identified and these sites are shown on Figure 5.1 and Figure 5.2 below. The qualifying features of interest/special conservation interests of these European Sites are provided as Appendix 2 to this screening report.

As can be seen in Figures 5.1 & 5.2 no European Sites are occurring at or in the immediate vicinity of the project site. As noted in Section 3.3.1 above the nearest European Sites are the Murrough Wetlands European Sites, located over 1.8km to the east of the project site.

As the nearest European Site is buffered from the project site by a distance of approximately 1.8km, the project will not have the potential to result in direct impacts to European Sites, such as loss, habitat damage or disturbance to Annex 1 qualifying habitats or physical interaction with Annex 2 qualifying species/special conservation interest bird species within the boundary of the European Site. Thus, this Screening exercise focuses on investigating whether it can or cannot be excluded, on the basis of objective information, that the project will have the potential to result in indirect effects to European Sites (i.e. impacts via emission pathways or interaction with mobile species outside of European Sites).

Using the SPR framework the project, as described in Section 2 of this Screening Report, represents the source of potential impacts to European Sites.

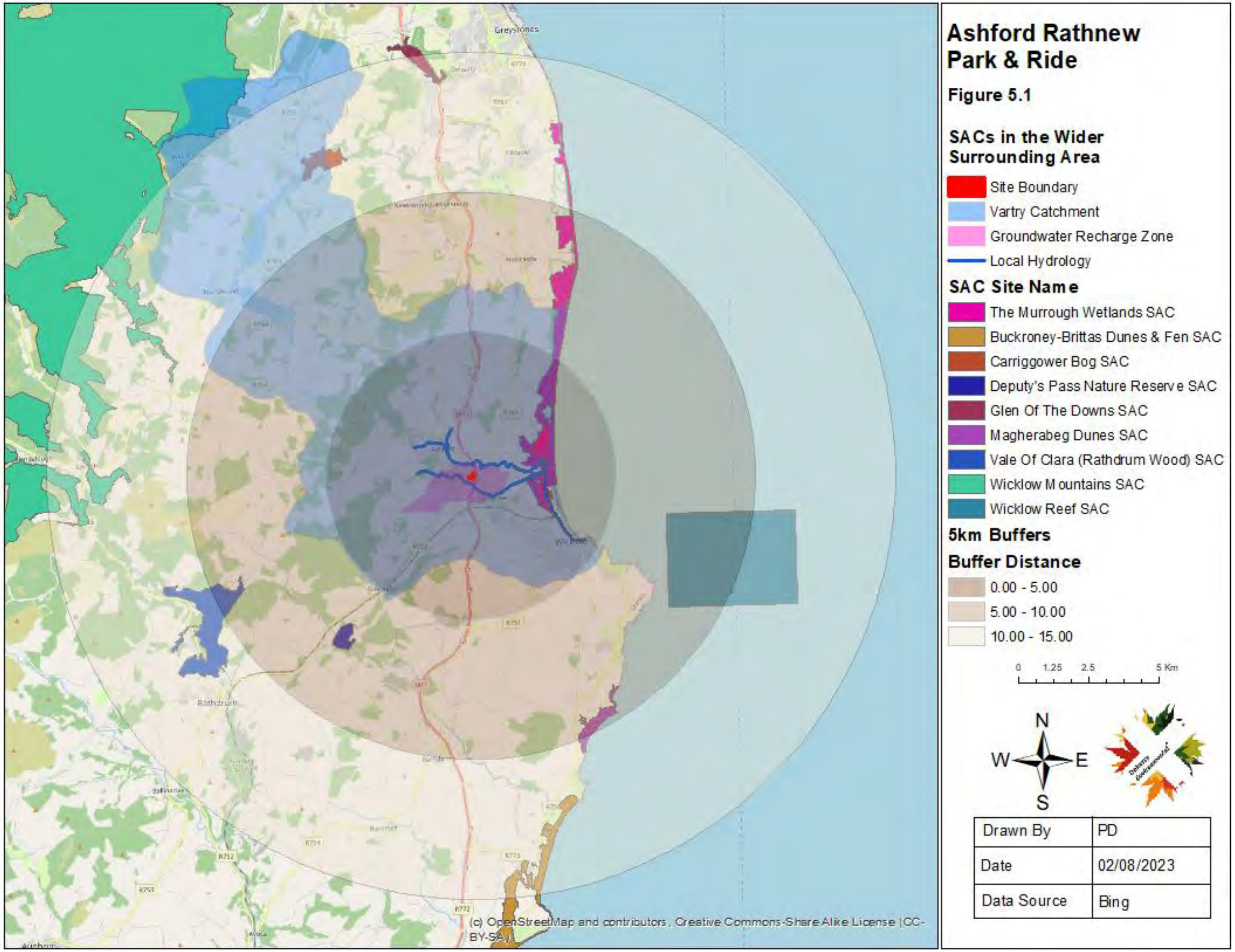
Potential pathways are restricted to any potential emission pathways connecting the project site to European Sites. An examination of the presence or absence of emission pathways and mobile

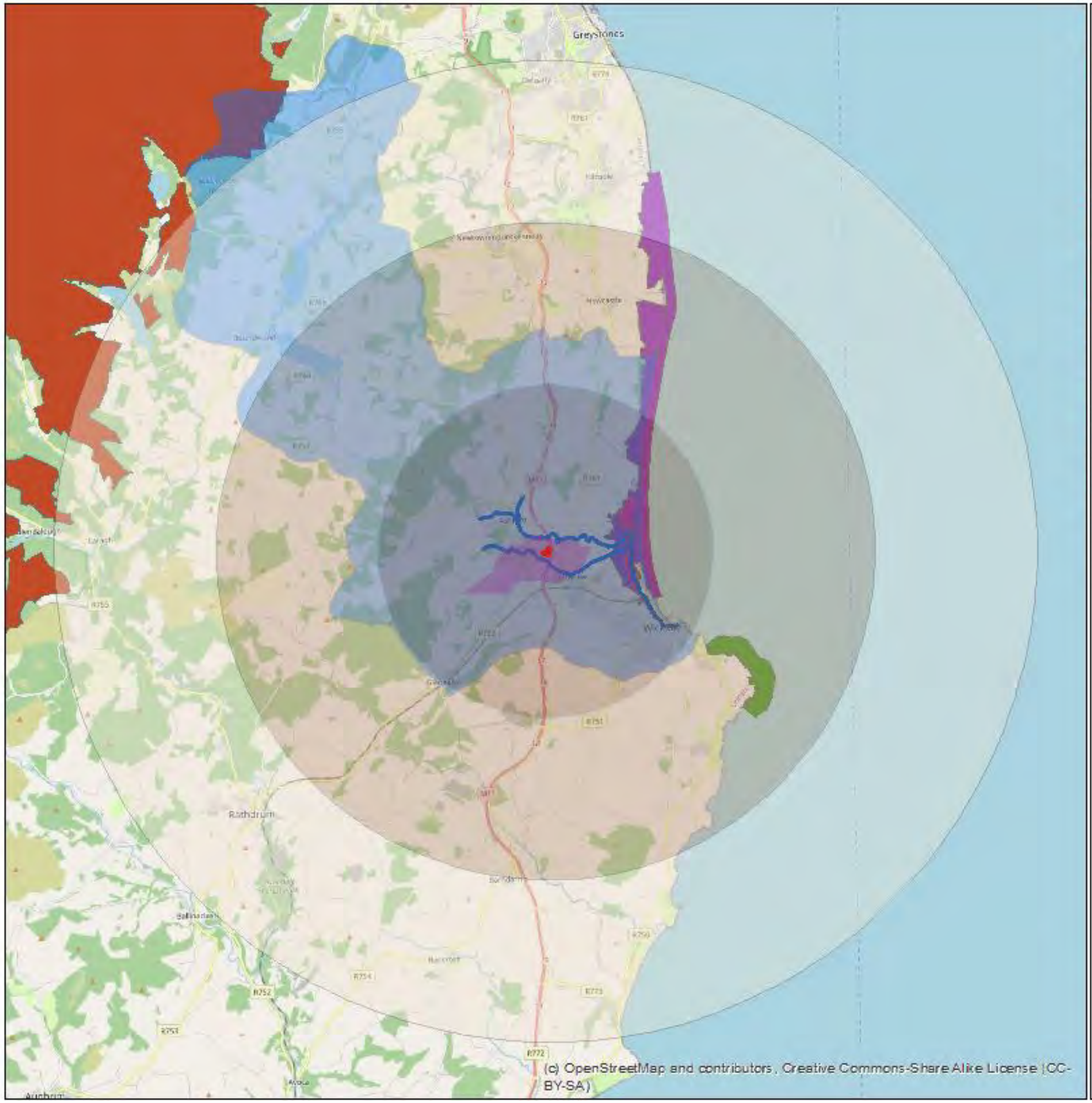
[2] **Current SAC shapefile layer dated May 2024; current SPA shapefile layer dated January 2024**

species pathways connecting the project site to European Sites in the wider surrounding area is provided in Section 5.1 below.

The receptors represent European Sites and their associated qualifying features of interest.

European Sites and their associated qualifying features are likely to occur in the zone of influence of the project only where pathways establish a link between the project and a European Site downstream


Ashford Rathnew Park & Ride
Figure 5.1
SACs in the Wider Surrounding Area
Site Boundary
Vartry Catchment
Groundwater Recharge Zone
Local Hydrology
SAC Site Name
The Murrough Wetlands SAC
Buckroney-Brittas Dunes & Fen SAC
Carriggower Bog SAC
Deputy's Pass Nature Reserve SAC
Glen Of The Downs SAC
Magherabeg Dunes SAC
Vale Of Clara (Rathdrum Wood) SAC
Wicklow Mountains SAC
Wicklow Reef SAC
5km Buffers
Buffer Distance
0.00 - 5.00
5.00 - 10.00
10.00 - 15.00
0 1.25 2.5 5 Km
N
W
E
S
Drawn By
PD
Date
02/08/2023
Data Source
Bing
Greystones
Rathdrum
(c) OpenStreetMap and contributors, Creative Commons-Share Alike License (CC-BY-SA)



Ashford Rathnew Park & Ride

Figure 5.2

SPAs in the Wider Surrounding Area

- Site Boundary
- Vartry Catchment
- Groundwater Recharge Zone
- Local Hydrology

SPA Site Name

- The Murrough SPA
- Wicklow Head SPA
- Wicklow Mountains SPA

5km Buffers

Buffer Distance

- 0.00 - 5.00
- 5.00 - 10.00
- 10.00 - 15.00

0 1.25 2.5 5 Km

N W E S

Drawn By	PD
Date	02/08/2023
Data Source	Bing

5.1 EXAMINATION OF PATHWAYS

Using the SPR framework, the project, as described in Section 2 of this Screening Report, represents the source of potential indirect impacts to European Sites. The construction and operation of new development projects can, in theory, generate the following emissions:

- Emissions to surface water
- Emissions to groundwater
- Noise and vibration emissions
- Emissions to air
- Light emissions;
- Visual emissions;
- Mobile species pathway; and
- Human Disturbance Pathway

Whether each of these potential pathways occur in the context of the current project and connect the project to any European Sites in the wider surrounding area is examined in the following bullet points:

5.1.1 Hydrological Pathway

As noted in Section 3.2 above the project site is located within the Vartry_SC_010 surface water sub-catchment of Vartry surface water catchment. There are no watercourses flowing through or bounding the project site. The nearest watercourse to the project site is the Vartry River approximately 160m to the north. The Cronroe Stream is located approximately 200m to the south (see Figure 3.1 above). There are no artificial drainage ditches draining the site. Both the Cronroe Stream and the Vartry River flow east and discharge into the Murrough Wetlands SAC & SPA.

The project will not be connected to the Cronroe Stream or any other surface waterbody. The project has been designed such that surface water generated on the car park surface will drain to ground via permeable asphalt and raingardens where it will be attenuated and drain to ground. It is not proposed to direct any surface water runoff from the project site to the Cronroe Stream or any other surface waterbodies.

In view of the above there is no hydrological pathway connecting the project to any European Sites in the wider surrounding area and as such no function hydrological impact pathway connects the project to European Sites.

5.1.2 Groundwater Pathway

Surface water generated during the construction phase and operation phase of the development will drain to ground. Wastewater generated during the operation phase from the 1 no. toilet facility will also drain to ground via a Puraflo Wastewater Treatment System or equivalent.

The project site and the The Murrough Wetlands European Sites are located within the Wicklow Groundwater Body IE_EA_G_076. The Murrough Wetlands SAC is designated for Annex 1 habitats, namely alkaline fen & calcareous fens, that are reliant on groundwater processes. However the project site is located within a different groundwater recharge zone to the Murrough Wetlands SAC & SPA (see Figure 3.1 and Figure 5.1 above) and is also located within an area of low groundwater vulnerability and low subsoil permeability. Give the distance between project site and the Murrough Wetlands SAC and SPA; the project site location within a separate groundwater recharge zone; and the low groundwater vulnerability and subsoil permeability at the project site, it is considered that no groundwater impact pathway connects the project site and The Murrough Wetlands European Sites.

In view of the above a functional groundwater impact pathway is excluded at this stage of the screening exercise.

5.1.3 Air Pathway

Guidance outlined by Holman et al. (2014), provides a risk assessment for ecological impacts arising from air emissions associated with the construction and development projects. European Sites including SACs and SPAs are ranked as highly sensitive sites and the risk to high sensitive sites ranges from high (at less than 20m from source) and medium (at less than 50m from source). Given the location of the nearest European Sites is approximately 1.8km from the project site, the project site lies well outside the 50m zone of influence of air emissions and as such any air emissions generated at the project site will not have the potential to result in likely significant effects to European Sites in the wider surrounding area.

5.1.4 Noise & Vibration

Noise and vibration emissions are considered to have the potential to result in negative impacts to biodiversity up to a 300m distance from the emission source. This distance is based on the maximum noise disturbance zone of 300m for wetland bird species, as specified by Cutts et al. (2013)[3]. Noise and vibration effects for other qualifying species of SACs as well as qualifying habitats of European Sites are less than 300m. For mammal species listed as qualifying features of interest for SACs in the surrounding area this distance is set at 150m, as per the NRA (2009). For qualifying aquatic species a potential noise and vibration impact pathway will only arise where works such as piling or blasting are proposed at instream or bankside locations within adjoining SACs. No such proposals form part of the proposed development. There are no European Sites occurring within 300m of the proposed development and the potential for noise and vibration emissions to function as a pathway is ruled out.

5.1.5 Light

Given the distance of the project site from the nearest European Sites of approximately 1.8km and its screening from the nearest SAC and Spa by the surrounding landscape, there will be no potential for the project to result in light emission to the Murrough Wetlands European Sites, which are the nearest European Sites to the project or any other European Sites further afield. As such the potential for a light emission pathway to connect the project site to European Sites is ruled out.

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[3] It is noted Nature Scotland (2022) published disturbances zones for bird species at a greater distance than 300m. However unlike Cutt et al. (2013) who specifically examined disturbance effects generated by noise stimuli, the potential disturbance stimuli set out in the Nature Scotland publication are not concerned specifically with noise stimuli. As such the Cutts et al. (2013) publication and maximum noise disturbance distance is relied upon.

5.1.6 Visual Disturbance

Given the distance of the project site from the nearest European Sites of over 1.8km and its screening from the Murrough Wetlands European Sites by the surrounding landscape, there will be no potential for the project to result in visual emission to these or any other European Sites further afield. As such the potential for a visual emission pathway to connect the project site to European Sites is ruled out.

5.1.7 Mobile Species Pathway

The project site does not support any habitats that are suitable for mobile Annex 2 species such as otters, whose national distribution range overlaps with the project site. As such no mobile species pathway is established by the project site and SACs in the wider surrounding area.

All SPAs in the wider surrounding area support mobile species in the form of the special conservation interest bird species for which they are designated. The nearest SPA to the project site is the Murrough Wetlands SPA. This SPA is designated for its role in supporting the following species: Red-throated Diver (Gavia stellata) [A001]; Greylag Goose (Anser anser) [A043]; Light-bellied Brent Goose (Branta bernicla hrota) [A046]; Wigeon (Anas penelope) [A050]; Teal (Anas crecca) [A052]; Black-headed Gull (Chroicocephalus ridibundus) [A179]; Herring Gull (Larus argentatus) [A184]; Little Tern (Sterna albifrons) [A195]. The SPA is also designated for its role in supporting Wetland and Waterbirds [A999].

Red-throated diver, wigeon, teal and little tern are all reliant on freshwater and/or marine waterbodies and no suitable habitat occurs at the project site for these species. Greylag goose, light-bellied brent geese, Black-headed Gull and herring gull are species that utilise both terrestrial and aquatic habitats. These species are known to utilise grassland habitats for foraging and roosting. Suitable grassland habitat occurs at the project site for these species.

The foraging range of these species from grassland habitats are as follows:

Light-bellied brent geese foraging range of up to 14km (Handy et al., 2023);

Greylag goose foraging range of up to 15km to 20km (SNH, 2016);

Black-headed Gull foraging range of up to 18.5km (NatureScot, 2023); and

Herring gull foraging range of up to 85.5km (NatureScot, 2023).

A review of the National Biodiversity Data Centre (NBDC) historical species records was completed in October 2024 to identify any historical records for the presence of these species in the four 1km grid squares T2795; T2796; T2895 & T2896 surrounding the project site. There are no records held by the NBDC indicating the presence of these species at or surrounding the project site.

In addition the presence of these species was not recorded on site during field surveys completed during August, September and October 2023; March 2024 and October 2024.

It is further noted that, given the footprint of the project site in the context of the wide ranging foraging areas for each of the four listed species above, the proposed conversion of grassland to hardstand in the form of a car park will represent an imperceptible and thus de-minimis effect, in terms of the availability of suitable terrestrial grassland habitat for these species. As such in light of the foregoing the potential for a mobile species pathway to connect the project site to the Murrough Wetlands SPA or any other SPAs in the wider surrounding area is ruled out.

5.1.8 Human Disturbance Pathway

Human disturbance, ex-situ of a project site, to a European Sites can arise as a result of land use activities generated by a project. An example of such an indirect impact is an increase in human presence and associated pressures within a European Sites. New developments in areas outside of, but proximate to European Sites, can result in an increase in the presence of people within European Sites, such as for recreational activities. However given the nature of the project, which will not generate increased levels of human activity within surrounding European Sites this example of a human disturbance pathway will not arise.

6.0 EXAMINATION OF LIKELY SIGNIFICANT EFFECTS

Given the absence of any potential impact pathways connecting the project to European Sites and their features of interest, no European Sites have been identified as occurring within the zone of influence of the project. Furthermore, the absence of functional impact pathways will ensure that this project does not have the potential, either alone or in combination with other projects, to result in likely significant effects to European Sites or the local environment surrounding the project site. A Screening Matrix, in line with European Commission (2021) guidelines is provided below in Table 6.1.

Table 6.1: Screening of the Project's potential to negatively affect European Sites

Assessment Criteria	
Describe any likely direct, indirect or secondary impacts of the project (either alone or in combination with other plans or projects) on European Sites by virtue of:	
Size and Scale	The project is small is size and scale, comprising the provision of a public transport infrastructure development in a landholding of approximately 2 Ha in size.
Land-take	The project does not involve any land-take from European Sites.
Distance from the nearest European Sites or key features of the site	The project site is located over 1.8km from the nearest European Site, the Murrough Wetlands SPA and Murrough Wetlands SAC.
Resource requirements	No resources associated with any European Sites will be required for, or utilized by the proposed project.

Emissions	**Wastewater Discharge** Wastewater generated from 1 no. toilet during the operation phase will be treated via a Puraflo Wastewater Treatment System or equivalent. The provision of this standard design features for the treatment of any wastewater loads generated by the toilet will ensure that all effluent being discharged to ground complies with EPA standards and does not present risk to groundwater. All wastewater generated during the construction phase will be contained within portaloo tank systems that will be routinely emptied by a licenced wastewater operator and transported to a licenced wastewater treatment plant for treatment prior to release to the environment. Wastewater generated by the project will not pose a risk of likely significant effects to European Sites and their features of interest. **wastewater Surface Water Drainage** The project will not result in the emission of surface water to any watercourse that could drain such waters to European Site. There is no surface water emission pathway connecting the project to European Sites. **Groundwater** The project will direct surface water generated at the project site during the construction phase and the operation phase to ground. The project site is located within a separate surface water recharge zone to any European Sites in the wider surrounding area. The project site is located in an area of low groundwater vulnerability indicating an inherent low risk of pollution to groundwaters. Given these factors as well as the factors set out in Section 5.1.2 above no functional groundwater pathway connects the project to European Sites in the wider surrounding area.

	Air All European Sites are located outside the zone of influence for air emissions that could be generated by the project. **Noise & Vibration** All European Sites are located outside the zone of influence for noise and vibration emissions that could be generated by the project. **Light** All European Sites are located outside the zone of influence for light emissions that could be generated by the project. **Visual Emissions** All European Sites are located outside the zone of influence for visual emissions that could be generated by the project. **Mobile species pathway** The project site is not relied upon by any mobile species that are listed as features of interest of European Sites in the wider surrounding area. As such no mobile species pathway connects the project to any European Sites. **Human Disturbance** The project will not result in any changes or increases of human activity within European Sites occurring in the wider surrounding area.

Excavation requirements	Excavations will be required on site during the construction phase. These excavations will be restricted to the project site will not present any risk to the European Sites in the wider surrounding area.
Transportation	The project will result in an overall reduction in private car usage and the distance travelled by private car. This will have the potential to result in overall benefits for transportation, traffic management and climate.
Duration of construction, operation etc.	The construction phase of the project will be completed over the short term within a period of 12 months. The project will be designed for a >50-year lifetime.
In-Combination Effects	As there are no pathways connecting the project site to European Sites in the wider surrounding area and given that all such European Sites have been identified as lying outside the zone of influence of the project, there will be no potential for the project to combine with other plans and projects to result in likely significant effects to European Sites in view of their conservation objectives.
Describe any likely changes to the European Sites arising as a result of:	
Reduction of habitat area	The proposed development will not result in a reduction in area of any habitats occurring within any European Sites in the wider surrounding area.
Disturbance of key species	The proposed project will not result in disturbances to key species designated as qualifying features of interest for surrounding European Sites.

Habitat or species fragmentation	The project will not have the potential to result in habitat or species fragmentation within any European Sites occurring in the wider surrounding area.
Reduction in species density	The project will not result in a reduction in the densities of any key species supported by surrounding European Sites
Changes in key indicators of conservation status	Due to the absence of impact pathways between the project site and surrounding European Sites, the project will not result in changes to key indicators to European Sites as set out under the conservation objectives attributes and targets for these Sites in their published site-specific conservation objectives.
Describe any likely impacts on the European Sites as a whole in terms of:	
Interference with key relationships that define the structure and function of the site	The project will not have the potential to interfere with the key relationships that define the structure and function of European Sites.
Provide indicators of significance as a result of the identification of effects set out above in terms of: Loss Fragmentation Disruption	Given that no pathways connect the project to European Sites and that all European Sites occur outside the zone of influence of the project, there will be no potential for the project to result in the loss, fragmentation, disturbance or disruption to any habitats or species that have been listed as features of interest for European Sites. In view of the above there will also be no potential for the project to result in any changes to key elements, such as water quality, that underpin the status of European Sites

Disturbance Change to key elements of the Site (e.g. water quality etc.)	
Describe from the above the elements of the project or plan or combination of elements, where the above impacts are likely to be significant or where the scale of magnitude of impacts is not known.	
It has been concluded that likely significant effects to the European Sites will not arise as a result of the project. Therefore, a Stage 2 Appropriate Assessment is not required.	

7.0 SCREENING STATEMENT CONCLUSION: FINDING OF NO SIGNIFICANT EFFECTS

During the Screening of the project 12 European Sites, comprising 9 SACs and 3 SPAs occur in the wider area surrounding the project site., the nearest of which is the Murrough Wetlands SAC and SPA, located approximately 1.8km to the east. All other European Sites are located at greater distance from the project site.

Given that no European Sites occur within or bounding the project site a source-pathway-receptor model was used to identify the presence of any European Sites in the wider surrounding area occurring within the zone of influence of the project. The examination based on the source-pathway-receptor model found that no pathways connect the project site to the any European Sites occurring in the wider area surrounding the project site and there will be no potential for the project to interact with them or their qualifying features of interest/special conservation interests. Given the absence of any pathways and any European Sites within the zone of influence of the project, there will be no potential for the project to combine with other plans, projects or existing pressures to result in cumulative adverse effects to European Sites in the wider surrounding area.

In light of the findings of this report it is the considered view of the authors of this Screening Report for Appropriate Assessment that it can be concluded by Wicklow County Council that the project is not likely, alone or in-combination with other plans or projects, to have a significant effect on any European Sites in view of their Conservation Objectives and on the basis of best scientific evidence and there is no reasonable scientific doubt as to that conclusion.

This Screening has resulted in a Finding of No Significant Effects and as such a Stage II Appropriate Assessment is not required.

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Fossitt J. A. (2000). *A Guide to Habitats in Ireland.* Heritage Council.

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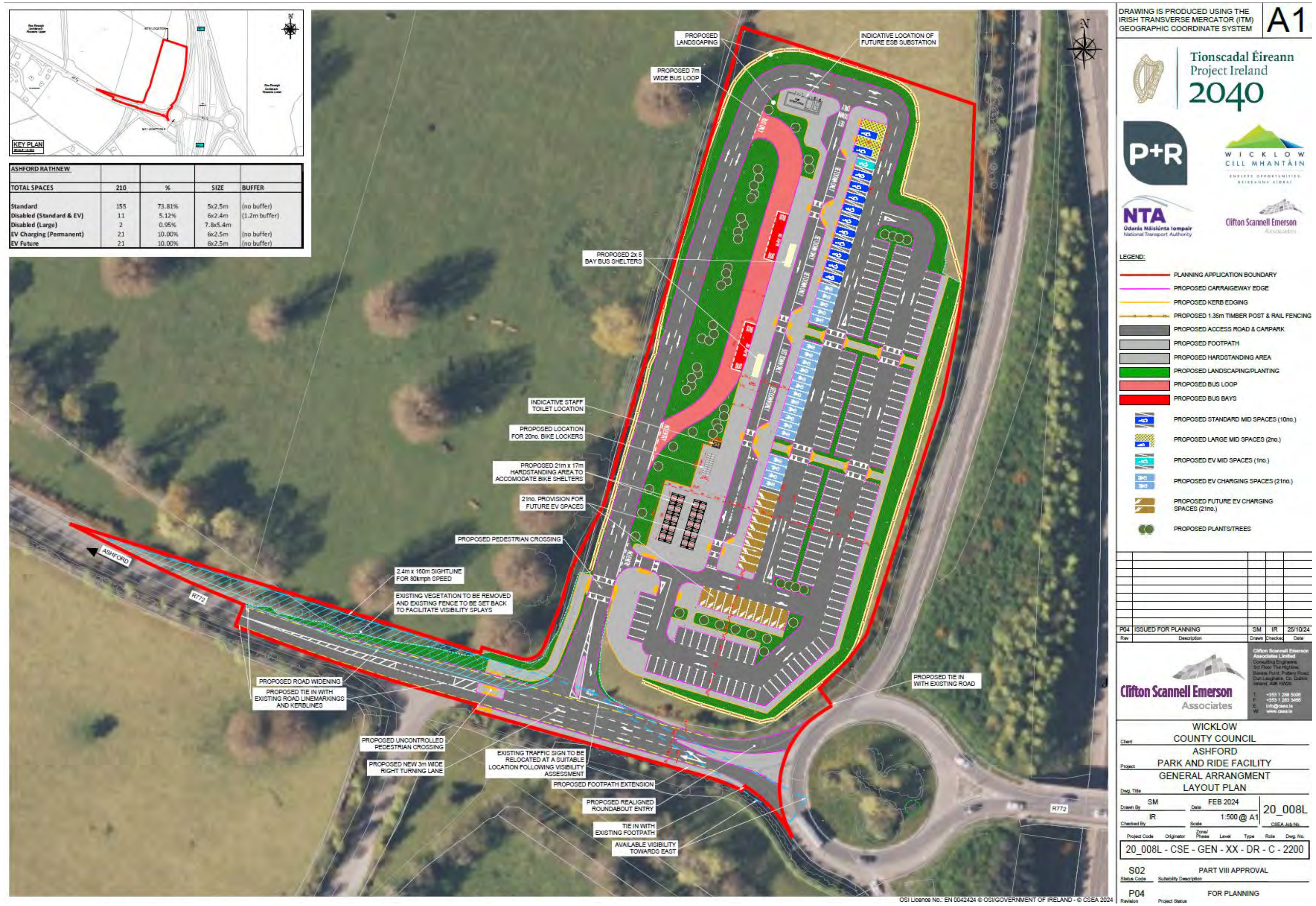
APPENDIX 1: SITE LAYOUT



ASHFORD RATHNEW				
TOTAL SPACES	210	%	SIZE	BUFFER
Standard	155	73.81%	5x2.5m	(no buffer)
Disabled (Standard & EV)	11	5.12%	6x2.4m	(1.2m buffer)
Disabled (Large)	2	0.95%	7.8x5.4m	
EV Charging (Permanent)	21	10.00%	6x2.5m	(no buffer)
EV Future	21	10.00%	6x2.5m	(no buffer)

APPENDIX 2: QUALIFYING FEATURES OF INTEREST

European Site	Features of Interest
Murrough Wetlands SAC	Annual vegetation of drift lines [1210]
	Perennial vegetation of stony banks [1220]
	Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330]
	Mediterranean salt meadows (Juncetalia maritimi) [1410]
	Calcareous fens with Cladium mariscus and species of the Caricion davallianae [7210]
	Alkaline fens [7230]
Glen of the Downs SAC	Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]
Wicklow Mountains SAC	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110]
	Natural dystrophic lakes and ponds [3160]
	Northern Atlantic wet heaths with Erica tetralix [4010]
	European dry heaths [4030]
	Alpine and Boreal heaths [4060]
	Calaminarian grasslands of the Violetalia calaminariae [6130]
	Species-rich Nardus grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe) [6230]
	Blanket bogs (* if active bog) [7130]
	Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) [8110]
	Calcareous rocky slopes with chasmophytic vegetation [8210]
	Siliceous rocky slopes with chasmophytic vegetation [8220]
	Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]
	Lutra lutra (Otter) [1355]
Wicklow Reef SAC	Reefs [1170]
Magherabeg Dunes SAC	Annual vegetation of drift lines [1210]
	Embryonic shifting dunes [2110]
	Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120]
	Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]

	Petrifying springs with tufa formation (Cratoneurion) [7220]
Deputy's Pass Nature Reserve SAC	Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]
Buckroney-Brittas Dunes And Fen SAC	Annual vegetation of drift lines [1210]
	Perennial vegetation of stony banks [1220]
	Mediterranean salt meadows (Juncetalia maritimi) [1410]
	Embryonic shifting dunes [2110]
	Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120]
	Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]
	Atlantic decalcified fixed dunes (Calluno-Ulicetea) [2150]
	Dunes with Salix repens ssp. argentea (Salicion arenariae) [2170]
	Humid dune slacks [2190]
	Alkaline fens [7230]
Vale Of Clara (Rathdrum Wood) SAC	Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]
Carriggower Bog SAC	Transition mires and quaking bogs [7140]
Wicklow Mountains SPA	Merlin (Falco columbarius) [A098]
	Peregrine (Falco peregrinus) [A103]
The Murrough SPA	Red-throated Diver (Gavia stellata) [A001]
	Greylag Goose (Anser anser) [A043]
	Light-bellied Brent Goose (Branta bernicla hrota) [A046]
	Wigeon (Anas penelope) [A050]
	Teal (Anas crecca) [A052]
	Black-headed Gull (Chroicocephalus ridibundus) [A179]
	Herring Gull (Larus argentatus) [A184]
	Little Tern (Sterna albifrons) [A195]
	Wetland and Waterbirds [A999]
Wicklow Head SPA	Kittiwake (Rissa tridactyla) [A188]

APPENDIX C

Noise and Vibration Assessment

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PARK AND RIDE ASHFORD

NOISE ASSESSMENT

Technical Report Prepared For

Wicklow County Council

Technical Report Prepared By

Alistair Maclaurin BSc (Hons) PgDip MIOA

Our Reference

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Date of Issue

10 September 2024

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Details	Written by	Approved by
Signature		
Name	Alistair Maclaurin	Damian Kelly
Title	Senior Acoustic Consultant	Technical Director (Acoustics)
Date	10 September 2024	10 September 2024

EXECUTIVE SUMMARY

The applicant is lodging a planning application seeking to develop a new park and ride facility in Ashford, County Wicklow.

A baseline noise survey has been completed in the vicinity of the development site with a view to establishing a picture of the prevailing environment in the area and to comment on the noise levels predicted in relation to the proposed development.

Best practice guidance has been considered and noise criteria outlined in relation to the construction and operational phase associated with the proposed development.

A review of the noise levels associated with the Proposed Development in light of relevant best practice noise guidance has been completed considering:

- Construction Noise;
- Additional traffic movements on public roads;
- Vehicle activity on new site roads, and;
- Car parking on site.

The relevant daytime and night criteria adopted have been satisfied in all instances assessed here. Comment has also been presented in relation to expected changes in noise levels due to the development. In all instances assessed, a 'Not Significant' impact is identified and therefore, based on the assessment presented here, no significant impact on residential amenity is predicted from the proposed construction or operational activities.

CONTENTS

1.0 INTRODUCTION

This noise assessment report has been prepared by AWN Consulting on behalf of the National Transport Authority. This report provides the details of the noise assessment undertaken for the proposed park and ride facility based near Ashford Rathnew, County Wicklow.

In order to address the proposal the following methodology has been followed:

- Carry out baseline noise surveys at locations representative of nearest noise sensitive locations in the vicinity of the Proposed Development.
- Identify appropriate noise criteria in relation to the Proposed Development.
- Predict the expected noise levels from the Proposed Development noise sources to the nearest noise sensitive locations.
- Compare the predicted noise levels associated with the Proposed Development in light of the adopted noise criteria.

Appendix A presents a glossary of the acoustic terminology used in this report.

The site layout is illustrated in Figure 1.

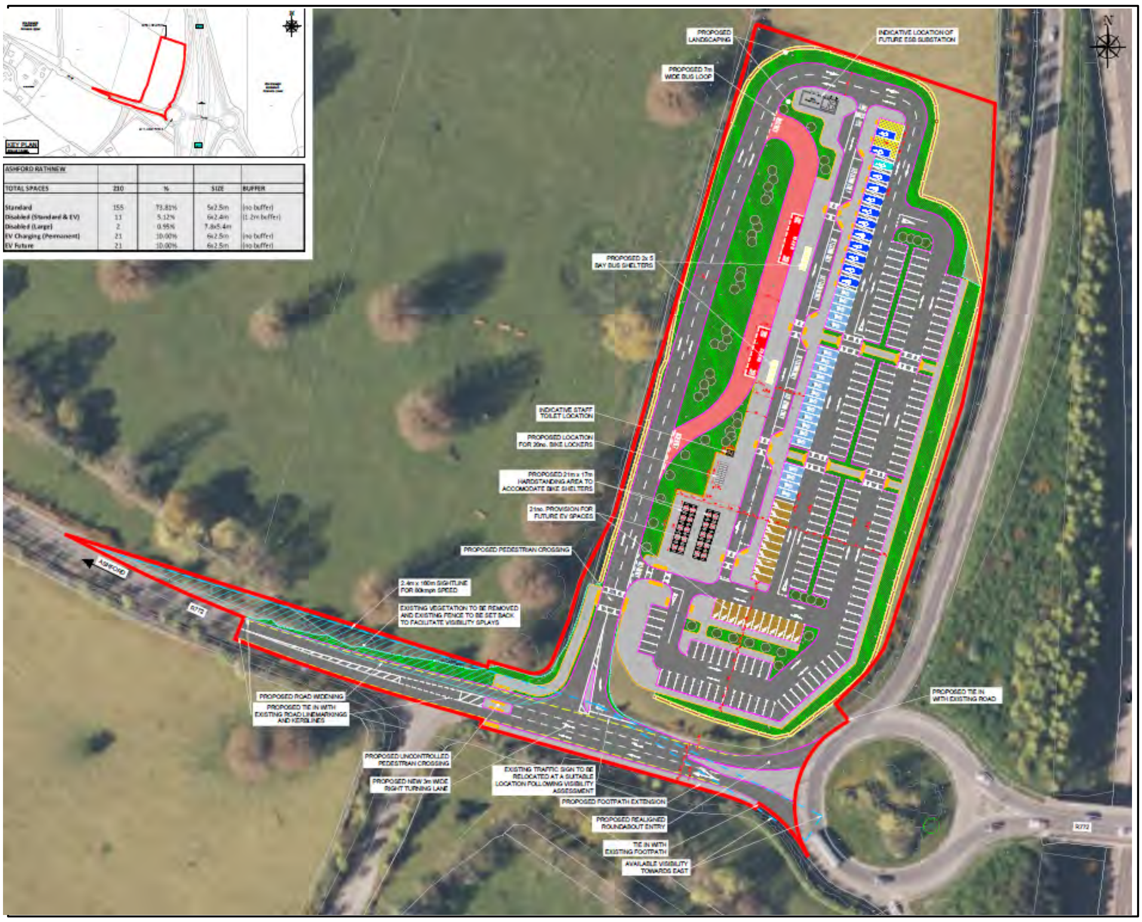


Figure 1 Site Layout

2.0 FUNDAMENTALS OF ACOUSTICS

In order to provide a broader understanding of some of the technical discussion in this report, this section provides a brief overview of the fundamentals of acoustics and the basis for the preparation of this noise assessment.

A sound wave travelling through the air is a regular disturbance of the atmospheric pressure. These pressure fluctuations are detected by the human ear, producing the sensation of hearing. In order to take account of the vast range of pressure levels that can be detected by the ear, it is convenient to measure sound in terms of a logarithmic ratio of sound pressures. These values are expressed as Sound Pressure Levels (SPL) in decibels (dB).

The audible range of sounds expressed in terms of Sound Pressure Levels is 0dB (for the threshold of hearing) to 120dB (for the threshold of pain). In general, a subjective impression of doubling of loudness corresponds to a tenfold increase in sound energy which conveniently equates to a 10dB increase in SPL. It should be noted that a doubling in sound energy (such as may be caused by a doubling of traffic flows) increases the SPL by 3dB.

The frequency of sound is the rate at which a sound wave oscillates and is expressed in Hertz (Hz). The sensitivity of the human ear to different frequencies in the audible range is not uniform. For example, hearing sensitivity decreases markedly as frequency falls below 250Hz. In order to rank the SPL of various noise sources, the measured level has to be adjusted to give comparatively more weight to the frequencies that are readily detected by the human ear. Several weighting mechanisms have been proposed but the ‘A-weighting’ system has been found to provide one of the best correlations with perceived loudness. SPLs measured using ‘A-weighting’ are expressed in terms of dB(A). An indication of the level of some common sounds on the dB(A) scale is presented in Figure 2.

The ‘A’ subscript denotes that the sound levels have been A-weighted. The established prediction and measurement techniques for this parameter are well developed and widely applied. For a more detailed introduction to the basic principles of acoustics, reference should be made to an appropriate standard text[1].

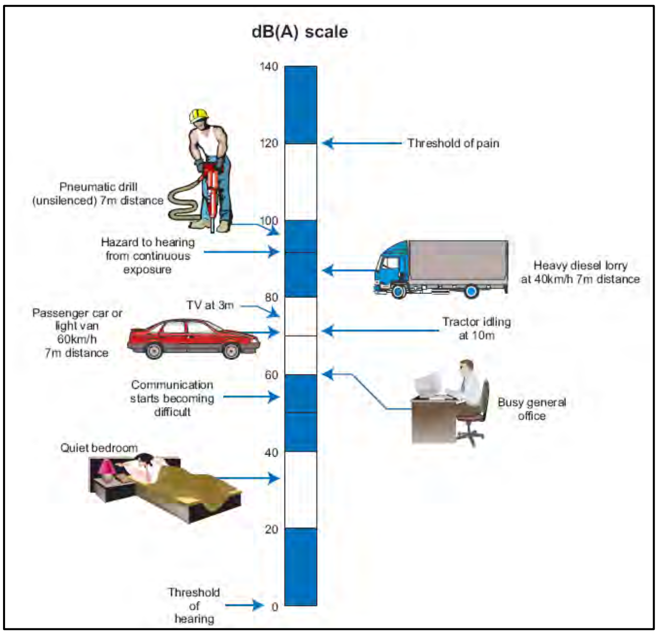


Figure 2
Level of Typical Common Sounds on the dB(A) Scale – (*TII Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes*)

1 For example, *Woods Practical Guide to Noise Control* by Ian Sharland.

3.0 DESCRIPTION OF RECEIVING ENVIRONMENT

In the first instance, it is important to make reference to the nearest noise sensitive receptors to the proposed development.

The nearest noise sensitive receptors are dwelling houses located to the south-west approximately 225m from the Proposed Development site (R1). Other residential receptors are at greater distances to the Proposed Development site (R2 and R4). Additionally, there is a commercial property located to the north-west approximately 325m from the Proposed Development site (R3). Noise survey locations have been selected to measure the noise environment proximate to the identified residential receptors. The location of noise sensitive receptors relative to the proposed development and the measurement locations has been indicated in Figure 3.

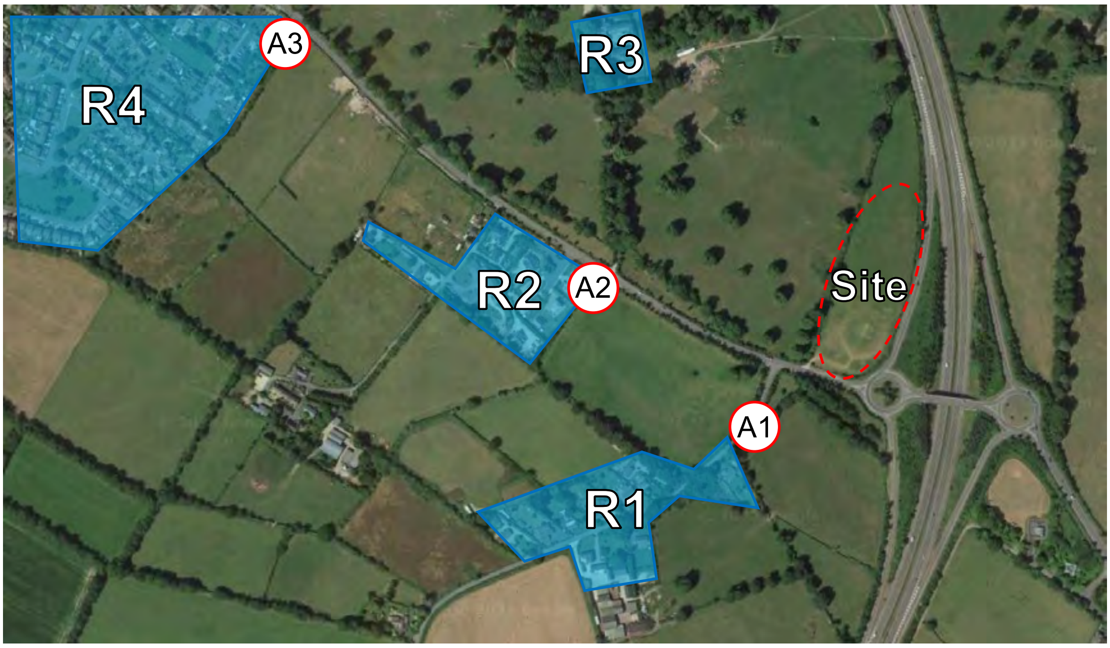


Figure 3 Receptor Locations and Noise Monitoring Locations

3.1 Environmental Noise Survey

An environmental noise survey was conducted in order to quantify the existing noise environment. The survey was conducted in general accordance with ISO1996-2: 2017 *Acoustics - Description, Measurement and Assessment of Environmental Noise – Determination of Environmental Noise Levels.* Specific details are set out in the following sections.

3.2 Choice of Measurement Locations

Three attended noise monitoring locations were selected for measurement. Figure 3 presents the measurement locations.

Location A1 Attended noise measurements located adjacent to the closest residential receptors to the south west of the site on Rosanna Close.

Location A2 Attended noise measurements located adjacent to the residential receptors on the R772.

Location A3 Attended noise measurements located adjacent to the residential receptors on the R772, further west from those at A2.

3.3 Survey Periods

Noise measurements were conducted from 10:58 hrs to 14:30 hrs on 19 July 2023.

3.4 Personnel & Instrumentation

The attended noise measurements were conducted using a B&K 2250 Sound Level Meter (S/N 2818091). The measurement apparatus was check calibrated both before and after the measurement survey using a Brüel & Kjær Type 4231 Sound Level Calibrator.

3.5 Procedure

The attended survey was conducted with three separate 15 minute periods measured cyclically at each of the three measurement positions. The data was saved to the sound level meter for later analysis.

3.6 Measurement Parameters

The noise survey results are presented in terms of the following three parameters:

L_{Aeq} is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period.

L_{Amax} is the instantaneous maximum sound level measured during the sample period.

L_{A90} is the sound level that is exceeded for 90% of the sample period. It is typically used as a descriptor for background noise.

The "A" suffix denotes the fact that the sound levels have been "A-weighted" in order to account for the non-linear nature of human hearing.

All sound levels in this report are expressed in terms of decibels (dB) relative to $2x10^{-5}$ Pa.

3.7 Results

The results of the attended measurements are presented in Table 1.

Location	Start Time	$L_{Aeq,15min}$ dB	L_{AFmax} dB	$L_{A90,15min}$ dB
1	10:58	65	81	49
	12:15	65	80	47
	13:22	65	81	50
2	11:19	74	88	52
	12:36	73	87	53
	13:46	73	86	53
3	11:51	64	86	47
	13:02	65	87	52
	14:08	66	86	50

Table 1 Summary of Attended Measured Noise Levels

It was noted at all locations that road traffic was the dominant source of noise.

3.8 Additional Published Noise Data

Figure 4 presents the existing road traffic noise across the proposed development site as detailed in the Environmental noise directive (END) 2002/49/EC noise mapping (https://gis.epa.ie) for L_{den}. Noise levels for roads adjacent to the receptors are not modelled, however the noise contours do indicate that noise levels of 60 to 69 dB L_{den} are typically experienced across the development site due to the proximity of the M11.

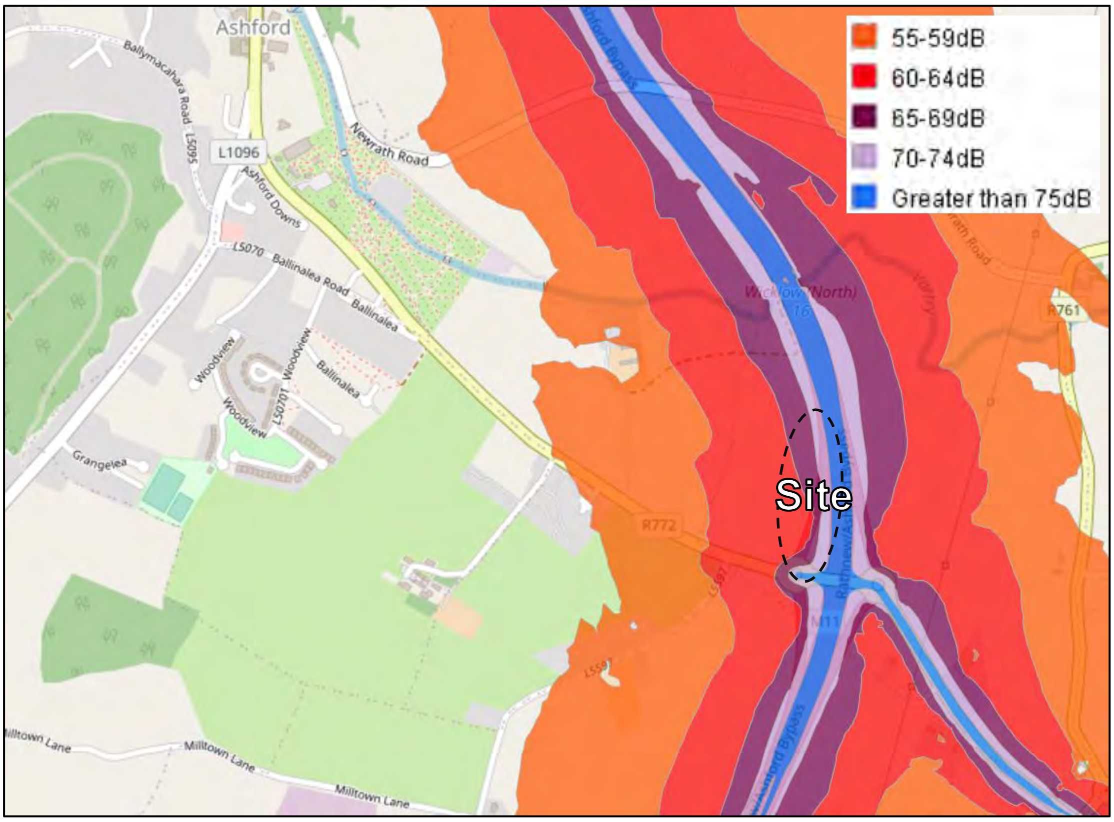


Figure 4 Noise Map of Site

4.0 REVIEW OF RELEVANT GUIDANCE

4.1 Construction Noise Impacts

There is no published statutory Irish guidance relating to the maximum permissible noise level that may be generated during the construction phase of a project. Local authorities normally control construction activities by imposing limits on the hours of operation and consider noise limits at their discretion.

In the absence of specific noise limits, appropriate criteria relating to permissible construction noise levels for a development of this scale may be found in the *British Standard BS 5228 – 1: 2009+A1:2014: Code of practice for noise and vibration control on construction and open sites – Noise*.

The approach adopted here calls for the designation of a noise sensitive location into a specific category (A, B or C) based on existing ambient noise levels in the absence of construction noise. This then sets a threshold noise value that, if exceeded at this location, indicates a significant noise impact is associated with the construction activities.

This document sets out guidance on permissible noise levels relative to the existing noise environment. Table 2 sets out the values which, when exceeded, signify a significant effect at the facades of residential receptors as recommended by BS 5228 – 1. These are cumulative levels, i.e. the sum of both ambient and construction noise levels.

Assessment category and threshold value period (L_{Aeq})	Threshold value, in decibels (dB)		
	Category A [Note A]	Category B [Note B]	Category C [Note C]
Night-time (23:00 to 07:00hrs)	45	50	55
Evenings and weekends [Note D]	55	60	65
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65	70	75

Table 2 Example Threshold of Significant Effect at Dwellings

Note A) Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than these values.
Note B) Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as category A values.
Note C) Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than category A values.
Note D) 19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays and 07:00 – 23:00 Sundays.

It should be noted that this assessment method is only valid for residential properties.

This assessment process determines if a significant construction noise impact is likely. Notwithstanding the outcome of this assessment, the overall acceptable levels of construction noise set out in the Transport Infrastructure Ireland (TII) publication *Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes*[2], which should not be exceeded at noise sensitive locations during the construction phase of the development. Table 3 sets out these levels.

2 *Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes,* March 2014, Transport Infrastructure Ireland

Days and Times	Noise Levels (dB re. $2x10^{-5}$ Pa)	
	$L_{Aeq(1hr)}$	L_{Amax}
Monday to Friday 07:00 to 19:00hrs	70	80
Monday to Friday 19:00 to 22:00hrs	60*	65*
Saturdays 08:00 to 16:30hrs	65	75
Sundays & Bank Holidays 08:00 to 16:30hrs	60*	65*

Table 3 Maximum Permissible Noise Levels at the Facade of Dwellings during Construction

*Note ** Construction activity at these times, other than that required for emergency works, will normally require the explicit permission of the relevant local authority.

Given the measured noise levels and taking account that the properties may be set back further from the roads than the baseline measurement positions the following noise thresholds have been selected. These thresholds are both in line with BS5228 and the TII guidelines:

70dB $L_{Aeq,1hr}$ at noise sensitive location
75dB $L_{Aeq,1hr}$ at commercial property

4.2 Construction Vibration Guidance

Peak particle velocity (PPV) is commonly used to assess the structural response of buildings to vibration. Reference to the following documents has been made for the purposes of this assessment in order to discuss appropriate PPV limit values.

- British Standard BS7385: 1993: *Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration*, and;
- British Standard BS5228-2: 2009 + A1: 2014: *Code of practice for noise and vibration control on construction and open sites – Vibration*.

BS5228-2 and BS7385 advise that, for soundly constructed residential property and similar structures that are generally in good repair, a threshold for minor or cosmetic (i.e. non-structural) damage should be taken as a peak component particle velocity (in frequency range of predominant pulse) of 15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz and 50 mm/s at 40 Hz and above. The standard also notes that below 12.5 mm/s PPV the risk of damage tends to zero.

The recommended vibration limits in order to avoid cosmetic damage to buildings, as set out in both documents referred to above, are reproduced in Table 4. The documents note that minor structural damage can occur at vibration magnitudes which are greater than twice those presented in Table 4. Major damage to a building structure is possible at vibration magnitudes greater than four times the values set out in the Table. It should be noted that these values refer to the base of the building.

Vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration, at a frequency of		
4 to 15 Hz	15 to 40 Hz	40 Hz and above
15 mm/s	20 mm/s	50 mm/s

Table 4 Transient Vibration Guide Values for Cosmetic Damage

Human response to vibration stimuli occurs at orders of magnitudes below those associated with any form of building damage, hence vibration levels lower than those indicated in Table 5 can lead to concern. BS5228-2 also provides a useful guide relating to the assessment of human response to vibration in terms of PPV. Whilst the guide values are commonly used to compare typical human response to construction works, they tend to relate closely to general levels of vibration perception from other general sources. Table 5 below summarises the range of vibration values and the associated potential effects on humans.

Vibration Level, PPV	Effect
0.14 mm/s	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies. At lower frequencies people are less sensitive to vibration.
0.3 mm/s	Vibration might be just perceptible in residential environments.
1 mm/s	It is likely that a vibration level of this magnitude in residential environments will cause complaint.

Table 5 Guidance on Effects of Human Response to PPV Magnitudes

The standards note that single or infrequent occurrences of these levels do not necessarily correspond to the stated effect in every case. Where these values are routinely measured or expected then an assessment in accordance with BS 6472-1 might be more appropriate to determine whether time varying exposure is likely to give rise to any degree of adverse comment.

4.3 Operational Noise Guidance

The key potential noise source associated with the site operation relates to traffic along the existing road network and traffic entering and exiting the car park. Given the existing road network already carries high traffic volumes, it is appropriate to consider the change in traffic noise level that may arise with and without the car park in operation.

In the absence of any Irish guidelines or standards relating to describing the effects associated with changes in road traffic noise levels, reference has been made to the *Design Manual for Roads and Bridges (2020) LA 111 Sustainability & Environmental Appraisal. Noise and Vibration Rev 2* (DMRB Noise and Vibration 2020). This document provides magnitude rating tables relating to changes in road traffic noise. Table 6 summarises the potential impact associated with defined changes in traffic noise level.

DMRB Magnitude of Change	Change in Noise Level, dB
Major	Greater than or equal to 10.0
Moderate	5 to 9.9
Minor	3.0 to 4.9
Negligible	Less than 3.0

Table 6 Significance of Change Criteria

Where changes in traffic noise levels are less than 3dB, the impact is deemed not significant. Where changes in traffic noise levels are greater than 5dB, the impact is deemed to be potentially significant.

5.0 NOISE ASSESSMENT

In order to predict the expected noise levels associated with the proposed development at nearby noise sensitive locations comment and / or predictions have been prepared considering the following expected site activities:

- Construction Noise & Vibration;
- Additional traffic movements on local roads;
- Vehicle activity on new site roads; and,
- Car parking on site

5.1 Construction Noise

The largest noise and vibration impact of the proposed development will occur during the construction phase due to the operation of various plant machinery and HGV movement to, from and around the site. However, the construction phase can be classed as a short-term phase.

Thresholds for significant noise from construction can be determined by referring to Table 2 and the baseline ambient noise levels, as outlined in the assessment criteria section. The daytime significance threshold for construction noise at the site is set at 70 dB $L_{Aeq,1hr}$. A night-time threshold is not included as construction work will not be taking place at night.

BS 5228-1 contains noise level data for various construction machinery. The noise levels relating to site clearance, ground excavation and loading lorries (dozers, tracked excavators and wheeled loaders) reach a maximum of 81 dB $L_{Aeq,1hr}$ at a distance of 10 m. For this assessment, a worst-case scenario is assumed of 3 no. such items with a sound pressure level (SPL) of 81 dB at 10 m operating simultaneously along the closest works boundary. This would result in a total noise level of 86 dB at 10 m and an equivalent combined sound power level of 114 dB L_{WA}. This worst-case scenario is the typical assumption made for developments of this size, on the basis that it is unlikely that more than 3 no. items of such plant/equipment would be operating simultaneously in such close proximity to each other.

Guidance on the approximate attenuation achieved by barriers surrounding the site is also provided in BS 5228-1. It states that when the top of the plant is just visible to the receiver over the noise barrier, an approximate attenuation of 5 dB can be assumed, while a 10 dB attenuation can be assumed when the noise screen completely hides the sources from the receiver.

In this scenario it is assumed that a barrier height will be chosen so as to partially hide the source. Table 7 shows the potential noise levels calculated at various distances based on the assumed sound power level and attenuation provided by the barrier of 5 dB.

Description of Noise Source	Sound Power Level (dB L_w(A))	Calculated noise levels at varying distances (dB $L_{Aeq,1hr}$)				
		10	20	30	50	100
3 no. items each with SPL of 81 dB at 10 m operating simultaneously.	114	81	75	71	67	61

Table 7 Potential construction noise levels at varying distances assuming attenuation of 10 dB from site barrier

Note that the closest receptor location is R1 which is located approximately 225m from the works. The calculated noise levels in Table 7 show that construction noise levels will be well within the adopted criteria and that the impacts will likely be not significant.

5.2 Additional Traffic Movements on Public Roads

A traffic impact assessment relating to the proposed development has been prepared as part of this planning assessment. Information from this report has been used to determine the predicted change in noise levels in the vicinity of a number of roads in the area surrounding the proposed development, for the opening and design years.

For the purposes of assessing potential noise impact, it is appropriate to consider the relative increase in noise level associated with traffic movements on existing roads and junctions with and without the development. This is presented in Table 8.

Ref	Description	AADT (2025)		AADT (2030)		AADT (2040)		Maximum Change in Noise Level (dB)	Impact
		Do Nothing	Do Something	Do Nothing	Do Something	Do Nothing	Do Something		
A	N11 North Ramp	6342	6376	6342	6376	6342	6376	+0.0	Negligible
B	R772 East	13457	13783	13457	13872	13457	14049	+0.2	
C	N11 South Ramp	1157	1429	1157	1518	1157	1695	+1.7	
D	R772 West	9158	9810	9158	9987	9158	10342	+0.5	
E	M11	51080	51148	54016	54084	55656	55724	+0.0	

Table 8 Noise Level Changes Due To Increased Traffic on Public Roads

The results of the predictions indicate that the noise impact due to increased road traffic on existing roads will be negligible and imperceptible.

5.3 Vehicle Activity on New Site Roads and Car Parking

The site entrance and access road is located at a distance of approximately 225m from receptor R1, consequently a traffic noise assessment has been undertaken to determine whether traffic along this new road and car park will have an impact on receptors in this location.

The noise level associated with an event of short duration, such as a passing vehicle movement, may be expressed in terms of its Sound Exposure Level (L_{AX}). The Sound Exposure Level can be used to calculate the contribution of an event or series of events to the overall noise level in a given period.

The appropriate formula is given below:

$$L_{Aeq,T} = L_{AX} + 10\log_{10}(N) - 10\log_{10}(T) + 10\log_{10}(r_1/r_2) \qquad \text{dB}$$

where:

$L_{Aeq,T}$ is the equivalent continuous sound level over the time period T (in seconds);
L_{AX} is the "A-weighted" Sound Exposure Level of the event considered(dB);
N is the number of events over the course of time period T;
r_1 is the distance at which L_{AX} is expressed;
r_2 is the distance to the assessment location.

The assumed mean value of Sound Exposure Level for cars and HGVs is in the order of 73 dB L_{AX} and 88 dB L_{AX} respectively at a distance of 5 metres. These values have been used to calculate the noise levels as a result of site traffic in isolation.

It's understood that worst case peak hour demand for the site will be 80 cars and 12 buses (6 trips total to account for the bus entering and exiting the site). Table 9 provides the calculated noise levels for the operation of the new site road at a distance of 225m where the closest receptor is located.

Predicted Peak Hour Noise Level from P&R Usage			
Number of LGV's	Number of HGV's	Calculated Noise Level dBA @ 5m from road	Calculated Noise Level dBA @ 225m from road (R1)
80	12	64	48

Table 9 Predicted Noise Levels due to Development Traffic in Isolation

Note that this calculation does not account for attenuation due to ground conditions or meteorological conditions, hence it can be considered worst case. The prediction also only considers the worst peak hour of the day, during all other hours the noise level from the car park and access road will be reduced.

The result of the calculation falls considerably below the measured baseline noise levels at the receptor locations, it also falls below the average background noise level at each location, hence it can be concluded that the change in noise level due to the new access road will be negligible at each receptor location.

Additionally, it should be noted that typical noise levels 10m beyond the boundary of a car park over a 16 hour day period are in the order of 44 dB $L_{Aeq,16hr}$. This noise level is the result of a calculation informed by previously measured data at an alternative site. Given the calculated levels of noise for the access road are 64 dB at 5m it can be concluded that the car parking activity on site will not produce any further impacts due to activity on the site access road dominating the noise environment.

6.0 CONCLUSIONS

The applicant is lodging a planning application seeking to develop a new park and ride facility in Ashford, Rathnew.

The relevant criteria adopted have been satisfied in all instances assessed here. Comment has also been presented in relation to expected changes in noise levels due to the development.

During the construction phase predictions indicate that construction noise levels will be within the adopted criteria and that impacts will be not significant.

In all operational instances a negligible impact is identified and therefore, based on the assessment presented here, no significant impact on residential amenity is predicted from the proposed operations.

APPENDIX A
GLOSSARY OF ACOUSTIC TERMINOLOGY

ambient noise The totally encompassing sound in a given situation at a given time, usually composed of sound from many sources, near and far.

background noise The steady existing noise level present without contribution from any intermittent sources. The A-weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90 per cent of a given time interval, T ($L_{AF90,T}$).

broadband Sounds that contain energy distributed across a wide range of frequencies.

dB Decibel - The scale in which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the RMS pressure of the sound field and the reference pressure of 20 micro-pascals (20 μPa).

dB L_{pA} An 'A-weighted decibel' - a measure of the overall noise level of sound across the audible frequency range (20 Hz – 20 kHz) with A-frequency weighting (i.e. 'A'–weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.

Hertz (Hz) The unit of sound frequency in cycles per second.

impulsive noise A noise that is of short duration (typically less than one second), the sound pressure level of which is significantly higher than the background.

$L_{Aeq,T}$ This is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period (T).The closer the L_{Aeq} value is to either the L_{AF10} or L_{AF90} value indicates the relative impact of the intermittent sources and their contribution. The relative spread between the values determines the impact of intermittent sources such as traffic on the background.

L_{AFN} The A-weighted noise level exceeded for N% of the sampling interval. Measured using the "Fast" time weighting.

L_{AFmax} is the instantaneous slow time weighted maximum sound level measured during the sample period (usually referred to in relation to construction noise levels).

$L_{Ar,T}$ The Rated Noise Level, equal to the L_{Aeq} during a specified time interval (T), plus specified adjustments for tonal character and impulsiveness of the sound.

L_{AF90} Refers to those A-weighted noise levels in the lower 90 percentile of the sampling interval; it is the level which is exceeded for 90% of the measurement period. It will therefore exclude the intermittent features of traffic and is used to estimate a background level. Measured using the "Fast" time weighting.

APPENDIX A
GLOSSARY OF ACOUSTIC TERMINOLOGY

L_{AT}(DW) equivalent continuous downwind sound pressure level.

L_{fT}(DW) equivalent continuous downwind octave-band sound pressure level.

L_{day} L_{day} is the average noise level during the day time period of 07:00hrs to 19:00hrs

L_{night} L_{night} is the average noise level during the night-time period of 23:00hrs to 07:00hrs.

low frequency noise LFN - noise which is dominated by frequency components towards the lower end of the frequency spectrum.

noise Any sound, that has the potential to cause disturbance, discomfort or psychological stress to a person exposed to it, or any sound that could cause actual physiological harm to a person exposed to it, or physical damage to any structure exposed to it, is known as noise.

noise sensitive location NSL – Any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or other area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels.

octave band A frequency interval, the upper limit of which is twice that of the lower limit. For example, the 1,000Hz octave band contains acoustical energy between 707Hz and 1,414Hz. The centre frequencies used for the designation of octave bands are defined in ISO and ANSI standards.

rating level See $L_{Ar,T}$.

sound power level The logarithmic measure of sound power in comparison to a referenced sound intensity level of one picowatt (1pW) per m^2 where:

$$Lw = 10 Log \frac{P}{P_0} \text{ dB}$$

Where: p is the rms value of sound power in pascals; and P_0 is 1 pW.

sound pressure level The sound pressure level at a point is defined as:

$$Lp = 20 Log \frac{P}{P_0} \text{ dB}$$

APPENDIX A
GLOSSARY OF ACOUSTIC TERMINOLOGY

specific noise level A component of the ambient noise which can be specifically identified by acoustical means and may be associated with a specific source. In BS 4142, there is a more precise definition as follows: 'the equivalent continuous A-weighted sound pressure level at the assessment position produced by the specific noise source over a given reference time interval ($L_{Aeq,\ T}$)'.

tonal Sounds which cover a range of only a few Hz which contains a clearly audible tone i.e. distinguishable, discrete or continuous noise (whine, hiss, screech, or hum etc.) are referred to as being 'tonal'.

$^{1}/_{3}$ octave analysis Frequency analysis of sound such that the frequency spectrum is subdivided into bands of one–third of an octave each.

APPENDIX D

Air Quality Assessment

ASHFORD PARK AND RIDE

AIR QUALITY

awnconsulting
A Trinity Consultants Company

CONTENTS

1.0 INTRODUCTION

This assessment considers the likely significant air quality impacts associated with the Proposed Development, a 210 space Park and Ride facility, located at Junction 16 on the M11, between Rathnew and Ashford, Co. Wicklow.

This chapter will provide an overview of the existing air quality conditions at the proposed development site, identify the relevant air quality standards and guidelines, describe the sources of air pollution associated and potential impacts of the proposed development, define mitigation measures that will be implemented to minimise the potential air quality impacts, and define the residual effects of the proposed development after the implementation of mitigation measures.

2.0 METHODOLOGY

2.1 RELEVANT LEGISLATION AND GUIDANCE

The principal guidance and best practice documents used to inform the assessment of potential impacts on Air Quality is summarised below.

- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 2018);
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017);
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (hereafter referred to as the Environmental Protection Agency (EPA) Guidelines) (EPA, 2022);
- Guidance on the Assessment of Dust from Demolition and Construction Version 2.2 (Institute of Air Quality Management (IAQM), 2024);
- A Guide To The Assessment Of Air Quality Impacts On Designated Nature Conservation Sites (Version 1.1) (IAQM, 2020);
- TII Guidance Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106 and TII Road Emissions Model (REM) online calculator tool (TII, 2022); and
- TII Road Emissions Model (REM): Model Development Report – GE-ENV-01107 (TII, 2024).

2.1.1 Ambient Air Quality Standards

In order to reduce the risk to health from poor air quality, National and European statutory bodies, the Department of the Environment, Heritage and Local Government in Ireland (DEHLG, 2004) and the European Parliament and Council of the European Union, have set limit values in ambient air for a range of air pollutants. These limit values or “Air Quality Standards” are health or environmental-based levels for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set.

Air quality significance criteria are assessed on the basis of compliance with the appropriate standards or limit values. The applicable standards in Ireland include the Air Quality Standards Regulations 2022, which incorporate European Commission Directive 2008/50/EC which has set limit values for a number of pollutants with the limit values for NO_2, PM_{10} and $PM_{2.5}$ being relevant to this assessment. Council Directive 2008/50/EC combines the previous Air Quality Framework Directive (96/62/EC) and its subsequent daughter directives (including 1999/30/EC and 2000/69/EC) and includes ambient limit values relating to $PM_{2.5}$. The applicable limit values for NO_2, PM_{10}, and $PM_{2.5}$ are set out in Table 1.

Table 1 *Ambient Air Quality Standards & TA Luft*

Pollutant	Regulation Note 1	Limit Type	Value
Dust Deposition	TA Luft (German VDI 2002)	Annual average limit for nuisance dust	350 mg/m^2/day
Nitrogen Dioxide (NO_2)	2008/50/EC	Hourly limit for protection of human health - not to be exceeded more than 18 times/year	200 µg/m^3
		Annual limit for protection of human health	40 µg/m^3
Particulate Matter (as PM_{10})	2008/50/EC	24-hour limit for protection of human health - not to be exceeded more than 35 times/year	50 µg/m^3 PM_{10}
		Annual limit for protection of human health	40 µg/m^3 PM_{10}
Particulate Matter (as $PM_{2.5}$) Stage 1	2008/50/EC	Annual limit for protection of human health	25 µg/m^3 $PM_{2.5}$
Particulate Matter (as $PM_{2.5}$) Stage 2 Note 2	2008/50/EC	Annual limit for protection of human health	20 µg/m^3 $PM_{2.5}$

Note 1 EU 2008/50/EC – Clean Air For Europe (CAFÉ) Directive replaces the previous Air Framework Directive (1996/30/EC) and daughter directives 1999/30/EC and 2000/69/EC

Note 2 Stage 2 indicative limit value for $PM_{2.5}$ to be applied from 1 January 2020 after review by the European Commission

In April 2023, the Government of Ireland published the *Clean Air Strategy for Ireland* (Government of Ireland, 2023), which provides a high-level strategic policy framework needed to reduce air pollution. The strategy commits Ireland to achieving the 2021 WHO Air Quality Guidelines Interim Target (IT) 3 by 2026, the IT4 targets by 2030 and the final targets by 2040. The strategy notes that a significant number of EPA monitoring stations observed air pollution levels in 2021 above the WHO targets; 80% of these stations would fail to meet the final $PM_{2.5}$ target of 5 µg/m^3 (WHO, 2021). The strategy also acknowledges that *"meeting the WHO targets will be challenging and will require legislative and societal change, especially with regard to both $PM_{2.5}$ and NO_2"*. Ireland will revise its air quality legislation in line with the proposed EU revisions to the CAFE Directive, which will set interim 2030 air quality standards and align the EU more closely with the WHO targets. At present, the applicable standards for assessing compliance in relation to air quality are those outlined in Table 2.

Table 2 WHO Air Quality Guidelines

Pollutant	Regulation	Limit Type	IT3 (2026)	IT4 (2030)	Final Target (2040)
NO_2	WHO Air Quality Guidelines	24-hour limit for protection of human health	50 µg/m^3 NO_2	50 µg/m^3 NO_2	25 µg/m^3 NO_2
		Annual limit for protection of human health	30 µg/ m^3 NO_2	20 µg/ m^3 NO_2	10 µg/m^3 NO_2
PM (as PM_{10})		24-hour limit for protection of human health	75 µg/ m^3 PM_{10}	50 µg/m^3 PM_{10}	45 µg/m^3 PM_{10}
		Annual limit for protection of human health	30 µg/ m^3 PM_{10}	20 µg/ m^3 PM_{10}	15 µg/m^3 PM_{10}
PM (as $PM_{2.5}$)		24-hour limit for protection of human health	37.5 µg/m^3 $PM_{2.5}$	25 µg/m^3 $PM_{2.5}$	15 µg/m^3 $PM_{2.5}$
		Annual limit for protection of human health	15 µg/m^3 $PM_{2.5}$5	10 µg/m^3 $PM_{2.5}$	5 µg/m^3 $PM_{2.5}$

2.1.2 Dust Deposition Guidelines

The concern from a health perspective is focused on particles of dust which are less than 10 microns and the EU ambient air quality standards outlined in Section 2.1.1 have set ambient air quality limit values for PM_{10} and $PM_{2.5}$.

Larger dust particles can give rise to dust that causes a nuisance, in Ireland there are no statutory guidelines regarding the maximum dust deposition levels that may be generated during the construction phase of a development.

However, guidelines for dust deposition, the German TA-Luft standard for dust deposition (non-hazardous dust) (German VDI, 2002) sets a maximum permissible emission level for dust deposition of 350 mg/m^2/day averaged over a one-year period at any receptors outside the site boundary. The TA-Luft standard has been applied for the purpose of this assessment based on recommendations from the EPA in Ireland in the document titled 'Environmental Management Guidelines - Environmental Management in the Extractive Industry (Non-Scheduled Minerals) (EPA, 2006). The document recommends that the Bergerhoff limit of 350 mg/m^2/day be applied to the site boundary of quarries. This limit value can be implemented with regard to dust impacts from construction of the proposed development.

2.1.3 Air Quality and Traffic Impact Significance Criteria

The TII document *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2022) details a methodology for determining air quality impact significance criteria for road schemes which can be applied to any project that causes a change in traffic. The degree of impact is determined based on the percentage change in pollutant concentrations relative to the do nothing scenario. The TII significance criteria are outlined in Table 4.9 of *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2022) and reproduced in Table 3 below.

These criteria have been adopted for the proposed development to predict the impact of NO_2 and PM_{10} emissions as a result of the proposed development.

Table 3 *Air Quality Significance Criteria*

Long term average concentration at receptor in assessment year	% Change in concentration relative to Air Quality Standard Value (AQLV)			
	1%	2-5%	6-10%	>10%
75% or less of AQLV	Neutral	Neutral	Slight	Moderate
76 – 94% of AQLV	Neutral	Slight	Moderate	Moderate
95 – 102% of AQLV	Slight	Moderate	Moderate	Substantial
103 – 109% of AQLV	Moderate	Moderate	Substantial	Substantial
110% or more of AQLV	Moderate	Substantial	Substantial	Substantial

Source Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106 (TII, 2022)

2.2 CONSTRUCTION PHASE METHODOLODY

2.2.1 Construction Dust Assessment

The Institute of Air Quality Management in the UK (IAQM) guidance document '*Guidance on the Assessment of Dust from Demolition and Construction*' (IAQM, 2024) outlines an assessment method for predicting the impact of dust emissions from demolition, earthworks, construction and haulage activities based on the scale and nature of the works and the sensitivity of the area to dust impacts. The IAQM methodology has been applied to the construction phase of this development in order to predict the likely risk of dust impacts in the absence of mitigation measures and to determine the level of site-specific mitigation required. Transport Infrastructure Ireland (TII) recommends the use of the IAQM guidance (IAQM, 2024) in the TII guidance document *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2022).

The major dust generating activities are divided into four types within the IAQM guidance (IAQM, 2024) to reflect their different potential impacts. These are:

- Demolition.
- Earthworks.
- Construction.
- Trackout (transport of dust and dirt from the construction site onto the public road network).

The magnitude of each of the four categories is divided into Large, Medium or Small scale depending on the nature of the activities involved. The magnitude of each activity is combined with the overall sensitivity of the area to determine the risk of dust impacts from site activities. This allows the level of site-specific mitigation to be determined.

2.2.2 Construction Traffic Assessment

Construction phase traffic also has the potential to impact air quality. The TII guidance *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2022) states that road links meeting one or more of the following criteria can be defined as being 'affected' by a proposed development and should be included in the local air quality assessment. While the guidance is specific to infrastructure projects the approach can be applied to any development that causes a change in traffic.

- Annual average daily traffic (AADT) changes by 1,000 or more;
- Heavy duty vehicle (HDV) AADT changes by 200 or more;
- Daily average speed change by 10 kph or more;
- Peak hour speed change by 20 kph or more;
- A change in road alignment by 5 m or greater.

Clifton Scannell Emerson Associates Consulting Engineers have prepared a Traffic Impact Assessment for the proposed development and Chapter 12 of the environmental report. It has been determined by Clifton Scannell Emerson Associates Consulting Engineers that the construction stage traffic will not increase by 1,000 AADT, or 200 HDV AADT, the development will not result in speed changes or changes in road alignment, therefore the traffic does not meet the above scoping criteria. As a result, a detailed air quality assessment of construction stage traffic emissions has been scoped out from any further assessment as there is no potential for significant impacts to air quality.

2.3 OPERATIONAL PHASE METHODOLOGY

Operational phase traffic has the potential to impact local air quality as a result of increased vehicle movements associated with the proposed development. The TII scoping criteria detailed in Section 2.2 were used to determine if any road links are affected by the proposed development and require inclusion in a detailed air dispersion modelling assessment. Clifton Scannell Emerson Associates Consulting Engineers have prepared a Traffic Impact Assessment for the proposed development and Chapter 12 of environmental report. It has been determined by Clifton Scannell Emerson Associates Consulting Engineers that the proposed development will result in the operational phase traffic increasing by more than 1,000 AADT on a small number of road links. Therefore, in accordance with the TII scoping criteria a detailed air dispersion modelling assessment of operational phase traffic emissions was conducted.

The impact to air quality as a result of changes in traffic is assessed at sensitive receptors in the vicinity of affected roads. The TII guidance (TII, 2022) states a proportionate number of representative receptors which are located in areas which will experience the highest concentrations or greatest improvements as a result of the proposed development are to be included in the modelling. The TII criteria state that receptors within 200m of impacted road links should be assessed; roads which are more than 200m from a receptor will not impact pollutant concentrations at that receptor. The TII guidance (TII, 2022) defines sensitive receptor locations as residential housing, schools, hospitals, places of worship, sports centres and shopping areas, i.e. locations where members of the public are likely to be regularly present. A total of 5 no. high sensitivity residential receptors (R1 – R5) were included in the modelling assessment (see Figure 1).

The TII guidance (TII, 2022) states that modelling should be conducted for NO_2 and PM_{10} for the Base, Opening and Design years for both the Do Minimum (Do Nothing) and Do Something scenarios. The modelling of PM_{10} can be used to show that the project does not impact on the $PM_{2.5}$ limit value as if compliance with the PM_{10} limit is achieved then compliance with the $PM_{2.5}$ limit will also be achieved. Modelling of operational NO_2 and PM_{10} concentrations has been conducted for the do nothing and do something scenarios using the TII Road Emissions Model (REM) online calculator tool (TII, 2024).

The following inputs are required for the REM tool: receptor locations, light duty vehicle (LDV) annual average daily traffic movements (AADT), annual average daily heavy duty vehicles (HDV AADT), annual average traffic speeds, road link lengths, road type, project county location and pollutant background concentrations. The *Default* fleet mix option was selected along with the *Intermediate Case* fleet data base selection, as per TII Guidance (TII, 2024). The *Intermediate Case* assumes a linear interpolation between the *Business as Usual* case, where current trends in vehicle ownership continue, and the *Climate Action Plan (CAP)* case, where adoption of low emission light duty vehicles occurs.

Using this input data the model predicts the road traffic contribution to ambient ground level concentrations at the identified sensitive receptors using generic meteorological data. The TII REM uses county-based Irish fleet composition for different road types, for different European emission standards from pre-Euro to Euro 6/VI with scaling factors to reflect improvements in fuel quality, retrofitting, and technology conversions. The TII REM also includes emission factors for PM_{10} emissions associated with brake and tyre wear (TII, 2024). The predicted road contributions are then added to the existing background concentrations to give the predicted ambient concentrations. The ambient concentrations are then compared with the relevant ambient air quality standards to assess the compliance of the proposed development with these ambient air quality standards.

2.3.1 Traffic Data Used in Modelling Assessment

Traffic flow information detailed in Table 4 was obtained from Clifton Scannell Emerson Associates Consulting Engineers for the purposes of this assessment. Data for the Base Year 2022 and the Do Nothing and Do Something scenarios for the Opening Year 2025 and Design Year 2040 were provided. A conservative growth factor has been applied to the traffic data to allow for cumulative development within the area. Specific cumulative developments were also investigated but it was found that there were no specific permitted developments that would lead to cumulative traffic impacts due to their increased distance from the site (see Traffic Impact Assessment and Chapter 12 for further details). The increases include an additional 176 bus movements daily on the R772 West by 2040.

The modelling assessment has been undertaken for several road links where impacts on R772 West met the TII scoping criteria in 2040, and which were within 200 m of receptors. Background concentrations have been included as per Section 4.2 of this chapter based on available EPA background monitoring data (EPA, 2023).

Table 4 *Traffic Data used in Air Modelling Assessment*

Road Name	Speed (kph)	Base Year 2022	Opening Year 2025		Design Year 2040	
			Do Nothing	Do Something	Do Nothing	Do Something
		LDV AADT (HDV AADT)	LDV AADT (HDV AADT)	LDV AADT (HDV AADT)	LDV AADT (HDV AADT)	LDV AADT (HDV AADT)
N11 North Ramp	80	5922 (339)	6003 (339)	6003 (373)	6003 (339)	6003 (373)
R772 East	80	12457 (631)	12826 (631)	13064 (719)	12826 (631)	13330 (719)
N11 South Ramp	120	1045 (112)	1045 (112)	1283 (146)	1045 (112)	1549 (146)
R772 West	50	8496 (375)	8783 (375)	9259 (551)	8783 (375)	9791 (551)
M11	120	46257 (2301)	48601 (2479)	48601 (2547)	52488 (3168)	52488 (3236)

Figure 1 *Sensitive Receptors included in Operational Phase Air Quality Modelling Assessment*

3.0 DIFFICULTIES IN COMPILING THE ASSESSMENT

There were no significant difficulties encountered in compiling the specified information for this assessment.

4.0 RECEIVING ENVIRONMENT

4.1 METEOROLOGICAL DATA

A key factor in assessing temporal and spatial variations in air quality is the prevailing meteorological conditions. Depending on wind speed and direction, individual receptors may experience very significant variations in pollutant levels under the same source strength (i.e. traffic levels) (WHO, 2006). Wind is of key importance in dispersing air pollutants and for ground level sources, such as traffic emissions, pollutant concentrations are generally inversely related to wind speed. Thus, concentrations of pollutants derived from traffic sources will generally be greatest under very calm conditions and low wind speeds when the movement of air is restricted. In relation to PM_{10}, the situation is more complex due to the range of sources of this pollutant. Smaller particles (less than $PM_{2.5}$) from traffic sources will be dispersed more rapidly at higher wind speeds. However, fugitive emissions of coarse particles ($PM_{2.5}$ - PM_{10}) will actually increase at higher wind speeds. Thus, measured levels of PM_{10} will be a non-linear function of wind speed.

The nearest representative weather station collating detailed weather records is Dublin Airport meteorological station, which is located approximately 48 km north of the site. Dublin Airport met data has been examined to identify the prevailing wind direction and average wind speeds over a five-year period (see Figure 2). For data collated during five representative years (2018 - 2028), the predominant wind direction is westerly to south-westerly; the mean wind speed over the long term 30-year averaging period 1991 - 2020 is 5.4 m/s (Met Éireann, 2023).

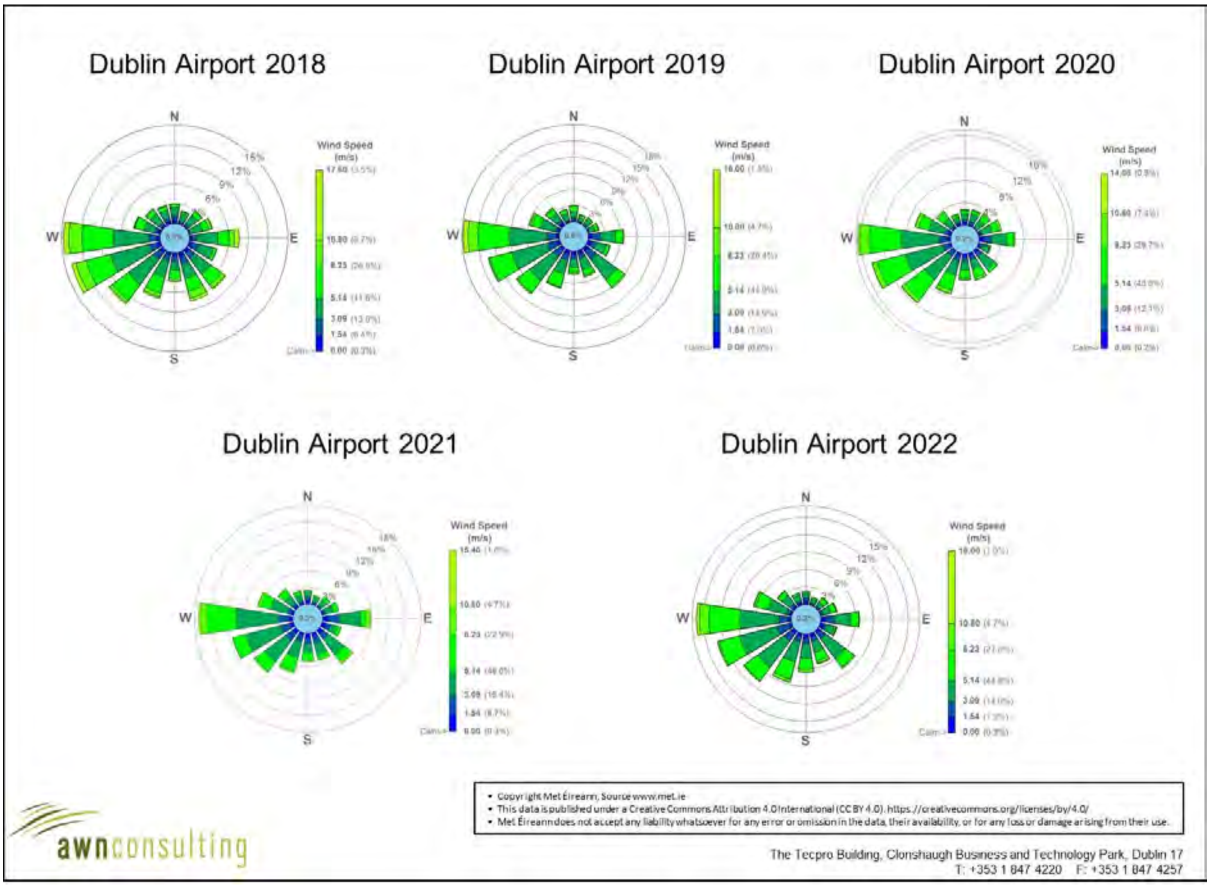


Figure 2 *Dublin Airport Windrose 2018 – 2022 (Met Éireann, 2023)*

4.2 BASELINE AIR QUALITY

Air quality monitoring programs have been undertaken in recent years by the EPA. The most recent annual report on air quality is "*Air Quality In Ireland 2022*" (EPA, 2023). The EPA website details the range and scope of monitoring undertaken throughout Ireland and provides both monitoring data and the results of previous air quality assessments (EPA, 2023).

As part of the implementation of the Framework Directive on Air Quality (1996/62/EC), four air quality zones have been defined in Ireland for air quality management and assessment purposes as outlined within the EPA document titled 'Air Quality In Ireland 2021' (EPA, 2022). Dublin is defined as Zone A and Cork as Zone B. Zone C is composed of 23 towns with a population of greater than 15,000. The remainder of the country, which represents rural Ireland but also includes all towns with a population of less than 15,000 is defined as Zone D. In terms of air monitoring, the area of the proposed development is on the boundary in Zone D.

The long-term monitoring data has been used to determine background concentrations for the key pollutants in the region of the proposed development. The background concentration accounts for all non-traffic derived emissions (e.g. natural sources, industry, home heating etc.). Data for 2020 has been included for indicative purposes only, it has not been used in determining background pollutant levels as the data is not considered representative due to the COVID-19 restrictions that were in place at the time.

4.2.1 *NO_2*

NO_2 monitoring was carried out at two rural Zone D locations in Emo and Kilkitt in recent years (EPA, 2023). The NO_2 annual average over the period 2017 – 2021 ranged from 2 – 5 µg/m^3 at the rural sites (See Table 5). Monitoring was carried out at the suburban background location of Castlebar respectively over the period 2017 – 2021, with annual mean concentrations ranging from 6 – 8 µg/m^3. Hence long-term average concentrations measured at all locations were significantly lower than the annual average limit value of 40 µg/m^3. The maximum 1-hour limit value of 200 µg/m^3 (measured as a 99.8th percentile i.e. 18 exceedances are allowed per year) was not exceeded in any year for any of the Zone D locations. The average results at the rural Zone D locations over the last five years suggests an upper average of 8 µg/m^3 as a background concentration. Based on the above information, a conservative estimate of the current background NO_2 concentration for the region of the development is 8 µg/m^3.

Table 5 *Background NO_2 Concentrations In Zone D Locations (µg/m^3)*

Station	Averaging Period Notes 1, 2	Year				
		2017	2018	2019	2020	2021
Castlebar	Annual Mean NO_2 (µg/m^3)	7	8	8	6	6
	99.8th %ile 1-hr NO_2 (µg/m^3)	60	60	59	76	73
Kilkit	Annual Mean NO_2 (µg/m^3)	2	3	5	2	2
	99.8th %ile 1-hr NO_2 (µg/m^3)	17	22	42	18	15
Emo Court	Annual Mean NO_2 (µg/m^3)	3	3	4	3	4
	99.8th %ile 1-hr NO_2 (µg/m^3)	28	42	28	38	47

Note 1 Annual average limit value of 40 µg/m^3 and hourly limit value of 200 µg/m^3 (EU Council Directive 2008/50/EC & S.I. No. 739 of 2022).

4.2.2 PM_{10}

Long-term PM_{10} measurements carried out at the rural Zone D location in Kilkitt and Claremorris over the period 2017 – 2021 ranged from 7 – 12 µg/m^3 (EPA, 2023). Results are also available for the suburban locations of Castlebar and Claremorris with concentrations ranging from 10 – 18 µg/m^3 over the five-year period. The average results at the Zone D locations over the last five years suggests an upper average of 12 µg/m^3 as a background concentration. Based on the above information an estimate of the current rural background PM_{10} concentration for the region of the development is 12 µg/m^3.

Table 6 *Background PM_{10} Concentrations In Zone D Locations (µg/m^3)*

Station	**Averaging Period** Notes 1, 2	**Year**				
		2017	**2018**	**2019**	**2020**	**2021**
Castlebar	Annual Mean PM_{10} (µg/m^3)	11	11	16	14	14
	90th %ile 24-hr PM_{10} (µg/m^3)	19	20	24	22	22
Kilkit	Annual Mean PM_{10} (µg/m^3)	8	9	7	-	-
	90th %ile 24-hr PM_{10} (µg/m^3)	14	15	13	-	-
Claremorris	Annual Mean PM_{10} (µg/m^3)	11	12	11	10	8
	90th %ile 24-hr PM_{10} (µg/m^3)	17	20	20	16	13
Enniscorthy	Annual Mean PM_{10} (µg/m^3)	-	-	18	15	14
	90th %ile 24-hr PM_{10} (µg/m^3)	17	20	20	16	13

Note 1 Annual average limit value of 40 µg/m^3 and 24-hour limit value of 50 µg/m^3 (EU Council Directive 2008/50/EC & S.I. No. 739 of 2022).

4.2.3 $PM_{2.5}$

Monitoring of both PM_{10} and $PM_{2.5}$ is carried out at the station in Claremorris which allows the $PM_{2.5}/PM_{10}$ ratio to be calculated (EPA, 2023). Over the period 2017 – 2021 annual mean $PM_{2.5}$ concentrations ranged from 4 – 8 µg/m^3 with a $PM_{2.5}/PM_{10}$ ratio ranging from 0.4 – 1. Based on this information, a conservative ratio of 0.9 was used to generate a rural background $PM_{2.5}$ concentration for the region of the development of 10.8 µg/m^3.

4.2.4 Summary

Based on the above information the air quality in the area is generally good, with concentrations of the key pollutants generally well below the relevant limit values. However, the EPA have indicated that road transport emissions are contributing to increased levels of NO_2 with the potential for breaches in the annual NO_2 limit value in future years at locations within urban centres and roadside locations. In addition, burning of solid fuels for home heating is contributing to increased levels of particulate matter (PM_{10} and $PM_{2.5}$). The EPA predict that exceedances in the particulate matter limit values are likely in future years if burning of solid fuels for residential heating continues (EPA, 2023).

The current background concentrations have been used in the operational phase air quality assessment for both the opening and design year as a conservative approach in order to predict pollutant concentrations in future years. This is in line with the TII methodology (TII, 2022).

4.3 SENSITIVITY OF THE RECEIVING ENVIRONMENT

In line with the UK Institute of Air Quality Management (IAQM) guidance document '*Guidance on the Assessment of Dust from Demolition and Construction'* (IAQM, 2024) prior to assessing the impact of dust from a proposed development the sensitivity of the area must first be assessed as outlined below. Both receptor sensitivity and proximity to proposed works areas are taken into consideration. For the purposes of this assessment, high sensitivity receptors are regarded as residential properties where people are likely to spend the majority of their time. Commercial properties and places of work are regarded as medium sensitivity while low sensitivity receptors are areas where people are present for short periods or where the public would not expect a high level of amenity.

In terms of receptor sensitivity to dust soiling, there are no high sensitivity residential properties within 100 m of the proposed development site boundary. There are between 10-100 no. high sensitivity residential between 100 and 350 m from the boundary. Therefore, the overall sensitivity of the area to dust soiling impacts is considered **low** based on the IAQM criteria outlined in Table 7.

Table 7 *Sensitivity of the Area to Dust Soiling Effects on People and Property*

Receptor Sensitivity	Number Of Receptors	Distance from source (m)			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	**Low**
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

In addition to sensitivity to dust soiling, the IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to human health impacts. The criteria take into consideration the current annual mean PM_{10} concentration, receptor sensitivity based on type (residential receptors are classified as high sensitivity) and the number of receptors affected within various distance bands from the construction works. A conservative estimate of the current annual mean PM_{10} concentration in the vicinity of the proposed development is 12 μg/m^3. There are between 10-100 no. high sensitivity residential between 100 and 350 m from the boundary. Based on the IAQM criteria outlined in Table 8, the worst-case sensitivity of the area to human health is considered **low**.

Table 8 *Sensitivity of the Area to Dust Related Human Health Impacts*

Receptor Sensitivity	Annual Mean PM_{10} Concentration	Number Of Receptors	Distance from source (m)				
			<20	<50	<100	<200	<350
High	< 24 µg/m^3	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	**Low**
		1-10	Low	Low	Low	Low	Low
Medium	< 24 µg/m^3	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	< 24 µg/m^3	>1	Low	Low	Low	Low	Low

The IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to dust-related ecological impacts. Dust emissions can coat vegetation leading to a reduction in the photosynthesising ability of the plant as well as other effects. The guidance states that dust impacts to vegetation can occur up to 50 m from the site and 50 m from site access roads, up to 500 m for the site entrance. There are no designated ecological sites within 50 m of the site or 500 m of the site entrance therefore there is no potential for impacts.

5.0 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed Project will consist of the redevelopment of the site to provide for:

- Two hundred and ten (210) private car parking spaces including disabled and electric vehicle spaces.
- Bus-stops with passenger shelters.
- Good quality pedestrian and cycle infrastructure.
- A new site access junction onto the adjacent road to facilitate seamless access from/to the motorway.

A full description of the development is available in Section 3 of the EIAR screening report. The sections below outline the characteristics of the proposed development as they relate to air quality. The following describes the primary sources of potential air and the primary sources of potential air quality impacts during the construction and operational phase.

5.1 CONSTRUCTION PHASE

During the construction stage the main source of air quality impacts will be as a result of fugitive dust emissions from site activities. Dust emissions will primarily occur as a result of demolition works, site preparation works, earthworks and the movement of trucks on site and exiting the site.

Construction stage traffic also has the potential to impact air quality through vehicle exhaust emissions. Clifton Scannell Emerson Associates Consulting Engineers have prepared a Traffic Impact Assessment for the proposed development and Chapter 12 of this environmental report. The construction stage traffic has been reviewed in line with the TII screening criteria (Section 2.2) and it was determined that a detailed air quality modelling assessment of construction stage traffic was not required due to the low level changes in traffic.

5.2 OPERATIONAL PHASE

The primary sources of air emissions in the operational context are deemed long term and will involve the change in traffic flows in the local areas which are associated with the development. There are small number of road links in close proximity to the proposed development that will experience a change in traffic volumes that meet the TII screening criteria (Section 2.2). Therefore, a detailed air quality modelling assessment of operational phase traffic emissions was conducted.

6.0 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

6.1 DO NOTHING SCENARIO

Under the Do Nothing Scenario no construction works will take place and the identified impacts of fugitive dust and particulate matter emissions will not occur. Impacts from increased traffic volumes and associated air emissions will also not occur. The ambient air quality at the site will remain as per the baseline and will change in accordance with trends within the wider area (including influences from new developments in the surrounding area, changes in road traffic, etc.). The Do Nothing scenario for the operational phase is assessed within Section 6.3 and was assessed to be neutral. Therefore, overall the Do-Nothing scenario can be considered neutral in terms of air quality.

6.2 CONSTRUCTION PHASE

The greatest potential impact on air quality during the construction phase of the proposed development is from construction dust emissions and the potential for nuisance dust. While construction dust tends to be deposited within 350 m of a construction site, the majority of the deposition occurs within the first 50 m. The extent of any dust generation depends on the nature of the dust (soils, peat, sands, gravels, silts etc.) and the nature of the construction activity. In addition, the potential for dust dispersion and deposition depends on local meteorological factors such as rainfall, wind speed and wind direction. A review of Dublin Airport meteorological data (see Section 4.1) indicates that the prevailing wind direction is westerly to south-westerly and wind speeds are generally moderate in nature. In addition, dust generation is considered negligible on days where rainfall is greater than 0.2 mm. A review of historical 30-year average data for Dublin Airport indicates that on average 199 days per year have rainfall over 0.2 mm (Met Éireann, 2023) and therefore it can be determined that over 54% of the time dust generation will be reduced.

In order to determine the level of dust mitigation required during the proposed works, the potential dust emission magnitude for each dust generating activity needs to be taken into account, in conjunction with the previously established sensitivity of the area (see Section 4.3). As per Section 2.2 the major dust generating activities are divided into four types within the IAQM guidance to reflect their different potential impacts. These are:

- Demolition;
- Earthworks;
- Construction; and
- Trackout (transport of dust and dirt from the construction site onto the public road network).

6.2.1 Demolition

There is no demolition associated with the proposed development.

6.2.2 Earthworks

Earthworks primarily involve excavating material, loading and unloading of materials, tipping and stockpiling activities. Activities such as levelling the site and landscaping works are also considered under this category. The dust emission magnitude from earthworks can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

- **Large** Total site area > 110,000 m^2, potentially dusty soil type (e.g. clay which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds > 6 m in height;
- **Medium** Total site area 18,000 m^2 – 110,000 m^2, moderately dusty soil type (e.g. silt), 5 – 10 heavy earth moving vehicles active at any one time, formation of bunds 3 – 6 m in height;
- **Small** Total site area < 18,000 m^2, soil type with large grain size (e.g. sand), < 5 heavy earth moving vehicles active at any one time, formation of bunds < 3 m in height.

The site area is between 18,000 m^2 and 110,000 m^2. Therefore, the dust emission magnitude for the proposed earthwork activities can be classified as medium. As outlined in Table 9 and combined with the sensitivity from Section 4.3, this results in an overall low risk of dust soiling impacts and human health impacts as a result of the proposed earthworks activities.

Table 9 *Criteria for Rating Risk of Dust Impacts – Earthworks (IAQM, 2024)*

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table 10 *Risk of Dust Impacts – Earthworks*

Receptor	Receptor Sensitivity	Dust Emission Magnitude – Earthworks	Risk of Dust-Related Impacts
Dust Soiling	Low	Medium	Low Risk
Human Health	Low		Low Risk

6.2.3 Construction

Dust emission magnitude from construction can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

- **Large** Total building volume > 75,000 m^3, on-site concrete batching, sandblasting;
- **Medium** Total building volume 12,000 m^3 – 75,000 m^3, potentially dusty construction material (e.g. concrete), on-site concrete batching;

- **Small** Total building volume < 12,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber).

The dust emission magnitude for the proposed construction activities can be classified as small with some passenger shelters, bike shelter and lockers and driver welfare facilities. The construction processes will have low dust potential due to elements being preconstructed. As outlined in Table 11 and combined with the sensitivity from Section 4.3, this results in an overall negligible risk of dust soiling impacts and human health impacts as a result of the proposed construction activities.

Table 11 *Criteria for Rating Risk of Dust Impacts – Construction (IAQM, 2024)*

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table 12 *Risk of Dust Impacts – Construction*

Receptor	Receptor Sensitivity	Dust Emission Magnitude – Earthworks	Risk of Dust-Related Impacts
Dust Soiling	Low	Small	Negligible
Human Health	Low		Negligible

6.2.4 Trackout

Factors which determine the dust emission magnitude are vehicle size, vehicle speed, number of vehicles, road surface material and duration of movement. Dust emission magnitude from trackout can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

- **Large** > 50 HGV (> 3.5 t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length > 100 m;
- **Medium** 10 - 50 HGV (> 3.5 t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 - 100 m;
- **Small** < 10 HGV (> 3.5 t) outward movements in any one day, surface material with low potential for dust release, unpaved road length < 50 m.

During the peak excavation phase there will be a maximum of 50 outward HGV movements per day. In addition there is some areas of up to 100 m of unpaved road on site. Therefore, the dust emission magnitude for the proposed trackout can be classified as large. As outlined in Table 13 and combined with the sensitivity from Section 4.3, this results in an overall low risk of dust soiling impacts and human health impacts as a result of the proposed trackout activities.

Table 13 *Criteria for Rating Risk of Dust Impacts – Trackout (IAQM, 2024)*

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small

High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table 14 *Risk of Dust Impacts – Trackout*

Receptor	Receptor Sensitivity	Dust Emission Magnitude – Earthworks	Risk of Dust-Related Impacts
Dust Soiling	Low	Large	Low Risk
Human Health	Low		Low Risk

6.2.5 Summary of Dust Emission Risk

The risk of dust impacts as a result of the proposed development are summarised in Table 15 for each activity. The magnitude of risk determined is used to prescribe the level of site-specific mitigation required for each activity in order to prevent significant impacts occurring.

There is at most a high risk of dust soiling impacts and a medium risk of human health impacts associated with the proposed works therefore dust mitigation measures associated with low-risk sites will be implemented to ensure there are no significant impacts at nearby sensitive receptors. In the absence of mitigation, dust impacts are predicted to be ***short-term, direct, negative*** and ***slight***.

Table 15 *Summary of Dust Impact Risk used to Define Site-Specific Mitigation*

Potential Impact	Dust Emission Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Emission Magnitude	N/A	Medium	Small	Large
Dust Soiling Risk	N/A	Low Risk	Negligible Risk	Low Risk
Human Health Risk	N/A	Low Risk	Negligible Risk	Low Risk

There is also the potential for traffic emissions to impact air quality in the short-term over the construction phase. Particularly due to the movements of HGVs and construction workers accessing the site. It is estimated that on average 10 no. staff will be working on the site during the construction phase. The construction stage traffic was reviewed in line with the TII assessment criteria in Section 2.2 to determine whether a detailed air quality assessment of traffic emissions was required. As the construction stage traffic did not meet the screening criteria, a detailed air quality assessment of construction stage traffic emissions was screened out. It can be concluded that construction phase traffic emissions will have a ***short-term, localised, neutral*** and ***non-significant*** impact on air quality.

6.3 OPERATIONAL PHASE

6.3.1 Operational Phase Traffic Assessment

The potential impact of the proposed development has been assessed by modelling emissions from the traffic generated as a result of the development. The traffic data includes the Do Nothing and Do Something scenarios (see Section 2.3). The impact of NO_2 and PM_{10} emissions for the opening and design years was predicted at the nearest sensitive receptors to the development. This assessment allows the significance of the development, with respect to both relative and absolute impacts, to be determined.

The TII guidance PE-ENV-01106 (TII, 2022) details a methodology for determining air quality impact significance criteria for TII road schemes and infrastructure projects however, this significance criteria can be applied to any development that causes a change in traffic. The degree of impact is determined based on both the absolute and relative impact of the proposed development. Results are compared against the 'Do-Nothing' scenario, which assumes that the proposed development is not in place in future years, in order to determine the degree of impact.

6.3.1.1 NO_2

The results of the assessment of the impact of the proposed development on NO_2 in the opening year 2025 and design year 2040 are shown in Table 16. The annual average concentration is in compliance with the limit value at the worst-case receptors in 2025 and 2040. Concentrations of NO_2 are at most 27% of the annual limit value in 2025 and 2040. There are predicted to be some increases in traffic between the opening and design years therefore, any decrease in concentration is due to increased uptake in electric vehicles and lower vehicle exhaust emissions. In addition, the TII guidance (TII, 2022) states that the hourly limit value for NO_2 of 200 µg/m^3 is unlikely to be exceeded at roadside locations unless the annual mean is above 60 µg/m^3. As predicted NO_2 concentrations are significantly below 60 µg/m^3 (Table 16) it can be concluded that the short-term NO_2 limit value will be complied with at all receptor locations.

The impact of the proposed development on annual mean NO_2 concentrations can be assessed relative to "Do Nothing (DN)" levels. NO_2 concentrations at the receptors assessed will increase as a result of the proposed development when compared with the Do-Nothing scenario. There will be at most an increase of 0.19 µg/m^3 at receptor R1, this is a 0.19% change from baseline conditions. Where the predicted annual mean concentrations are less than 75% of the air quality standard (see Table 1) and there is a less than 5% change in concentrations compared with the Do-Nothing scenario then the impact is considered neutral as per the TII significance criteria (see Table 3). Therefore, the impact of the proposed development on NO_2 concentrations is neutral.

Table 16 *Annual Mean NO_2 Concentrations (µg/m^3)*

Receptor	Impact Opening Year				Impact Design Year			
	DN	DS	Impact (DS-DN)	Description	DN	DS	DS-DN	Description
1	10.1	10.2	0.18	Neutral	8.7	8.8	0.10	Neutral
2	10.2	10.4	0.19	Neutral	8.8	8.9	0.10	Neutral
3	8.1	8.1	0.01	Neutral	8.0	8.1	0.01	Neutral
4	10.9	10.9	0.00	Neutral	9.0	9.0	0.01	Neutral
5	8.4	8.4	0.00	Neutral	8.1	8.1	0.00	Neutral

6.3.1.2 PM_{10}

In relation to changes in PM_{10} concentrations as a result of the proposed development, the results of the assessment can be seen in Table 17 for the opening year 2025 and design year 2040. The annual average concentration is in compliance with the limit value at the worst-case receptors in 2025 and 2040. Concentrations of PM_{10} are at most 33% of the annual limit value in 2025 and 2040. In addition, the proposed development will not result in any exceedances of the daily PM_{10} limit value of 50 µg/m^3. The impact of the proposed development on annual mean PM_{10} concentrations can be assessed relative to "Do Nothing (DN)" levels. PM_{10} concentrations at the receptors assessed will increase as a result of the proposed development when compared with the Do-Nothing scenario. There will be at most an increase of 0.14 µg/m^3 at receptor R2, this is a 1.1% change from baseline conditions. As with NO_2, where the predicted annual mean concentrations are less than 75% of the air quality standard (see Table 1) and there is a less than 5% change in concentrations compared with the Do-Nothing scenario then the impact is considered neutral as per the TII significance criteria (see Table 3). Therefore, the impact of the proposed development on PM_{10} concentrations is neutral.

Overall, the potential impact of the proposed development on ambient air quality in the operational stage is considered ***long-term, localised, neutral, imperceptible*** and ***non-significant***.

Table 17 *Annual Mean PM_{10} Concentrations (µg/m^3)*

Receptor	Impact Opening Year				Impact Design Year			
	DN	DS	Impact (DS-DN)	Description	DN	DS	DS-DN	Description
1	12.8	12.9	0.10	Neutral	12.8	12.9	0.13	Neutral
2	12.9	13.0	0.10	Neutral	12.8	13.0	0.14	Neutral
3	12.1	12.1	0.01	Neutral	12.1	12.1	0.01	Neutral
4	12.9	12.9	0.00	Neutral	12.9	12.9	0.00	Neutral
5	12.1	12.1	0.00	Neutral	12.1	12.1	0.00	Neutral

7.0 REMEDIAL AND MITIGATION MEASURES

7.1 CONSTRUCTION PHASE MITIGATION

The proposed development has been assessed as having a low risk of dust soiling impacts and a low risk of dust related human health impacts during the construction phase as a result of demolition, earthworks, construction and trackout activities (see Section 6.2). Therefore, the following dust mitigation measures shall be implemented during the demolition and construction phases of the proposed development. These measures are appropriate for sites with a low risk of dust impacts and aim to ensure that no significant nuisance occurs at nearby sensitive receptors. The mitigation measures draw on best practice guidance from Ireland, Air Quality Monitoring and Noise Control Unit's Good Practice Guide for Construction and Demolition (DCC, 2018), the UK, Guidance on the Assessment of Dust from Demolition and Construction Version 2.2 (IAQM, 2024), Controlling Particles, Vapours & Noise Pollution from Construction Sites (BRE, 2003), Planning Advice Note PAN50 Annex B: Controlling The Environmental Effects Of Surface Mineral Workings Annex B: The Control of Dust at Surface Mineral Workings (The Scottish Office, 1996), Controlling the Environmental Effects of Recycled and Secondary Aggregates Production Good Practice Guidance (ODPM, 2002)) and the USA, Fugitive Dust Technical Information Document for the Best Available Control Measures (USEPA, 1997). Specific attention has been given to the measures required by Dublin City Council in their document *Air Quality Monitoring and Noise Control Unit's Good Practice Guide for Construction and Demolition* (DCC, 2018). These measures will be incorporated into the overall Construction Environmental Management Plan (CEMP) prepared for the site. The CEMP details the commitments and mitigation measures to be implemented by the developer and their appointed contractors for the construction of the proposed development. The measures are divided into different categories for different activities.

Communications

- The name and contact details of a person to contact regarding air quality and dust issues shall be displayed on the site boundary, this notice board should also include head/regional office contact details.

Site Management

- During working hours, dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions. Dry and windy conditions are favourable to dust suspension therefore mitigations must be implemented if undertaking dust generating activities during these weather conditions.

- A complaints register will be kept on site detailing all telephone calls and letters of complaint received in connection with dust nuisance or air quality concerns, together with details of any remedial actions carried out

Preparing and Maintaining the Site

- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
- Fully enclose specific operations where there is a high potential for dust production and the site is active for an extensive period.
- Avoid site runoff of water or mud.
- Keep site fencing, barriers and scaffolding clean using wet methods.
- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.
- Cover, seed or fence stockpiles to prevent wind whipping.

Operating Vehicles / Machinery and Sustainable Travel

- Ensure all vehicles switch off engines when stationary - no idling vehicles.
- Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
- Impose and signpost a maximum-speed-limit of 15 kph haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
- Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.

Operations

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes and conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
- Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

Waste Management

- Avoid bonfires and burning of waste materials.

Measures Specific to Earthworks

- During dry and windy periods, and when there is a likelihood of dust nuisance, a bowser will operate to ensure moisture content is high enough to increase the stability of the soil and thus suppress dust.

Measures Specific to Construction

- Avoid scabbling (roughening of concrete surfaces) if possible.
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.

Measures Specific to Trackout

- A speed restriction of 15 kph will be applied as an effective control measure for dust for on-site vehicles.
- Street and footpath cleaning must be undertaken during the demolition and ground works phase to minimise dust emissions. This can be carried out using water-assisted dust sweeper(s). If sweeping using a road sweeper is not possible due to the nature of the surrounding area then a suitable smaller scale street cleaning vacuum will be used.
- Avoid dry sweeping of large areas.
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
- Record all inspections of haul routes and any subsequent action in a site log book.
- Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).

Monitoring

- Undertake daily on-site and off-site inspections, where receptors (including roads) are nearby, to monitor dust, record inspection results in the site inspection log. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100 m of site boundary, with cleaning to be provided if necessary.
- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

7.2 OPERATIONAL PHASE

No mitigation is proposed for the operational phase of the proposed development as impacts to air quality will be neutral and non-significant.

8.0 MONITORING

8.1 CONSTRUCTION PHASE

During working hours, dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions. The Principal Contractor or equivalent must monitor the contractors' performance to ensure that the proposed mitigation measures are implemented and that dust impacts and nuisance are minimised.

Monitoring of construction dust deposition at nearby sensitive receptors during the construction phase of the proposed development will be carried out to ensure mitigation measures are working satisfactorily. This will be done using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2m above ground level. Dust deposition monitoring will be carried out on a monthly basis (between 28 - 32 days) for at least one month (ideally three months) in order to capture baseline conditions pre enabling works, as well as for the duration of the enabling works and construction period. An independent contractor will be appointed to carry out this monitoring. The TA Luft limit value is 350 mg/m2/day during the monitoring period of 30 days (+/- 2 days).

8.2 OPERATIONAL PHASE

There is no monitoring recommended for the operational phase of the development as impacts to air quality is predicted to be imperceptible.

9.0 RESIDUAL EFFECTS OF THE PROPOSED DEVELOPMENT

9.1 CONSTRUCTION PHASE

9.1.1 Air Quality

When the dust mitigation measures detailed in the mitigation section of this report (Section 7.1) are implemented, the residual effect of fugitive emissions of dust and particulate matter from the site will be ***short term, direct, negative*** and ***slight*** in nature, posing no nuisance at nearby receptors.

9.1.2 Human Health

Best practice mitigation measures are proposed for the construction phase of the proposed development which will focus on the pro-active control of dust and other air pollutants to minimise generation of emissions at source. The mitigation measures that will be put in place during construction of the proposed development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of human health. Therefore, the residual effect of construction of the proposed development will be ***short term, direct, negative*** and ***imperceptible*** with respect to human health.

9.2 OPERATIONAL PHASE

9.2.1 Air Quality

Air dispersion modelling of operational traffic emissions associated with the proposed development was carried out using the TII REM tool. The modelling assessment determined that the change in emissions of NO_2 and PM_{10} at nearby sensitive receptors as a result of the proposed development will be neutral. Therefore, the operational phase impact to air quality is ***long-term, localised, neutral, imperceptible*** and ***non-significant***.

9.2.2 Human Health

Emissions of air pollutants are predicted to be significantly below the ambient air quality standards which are based on the protection of human health. Therefore, impacts to human health are ***long-term, direct, neutral***, ***imperceptible*** and ***non-significant***.

10.0 CUMULATIVE IMPACTS

A full list of developments that are currently permitted or under construction within the surrounding area are identified in Appendix A and discussed in Section 3.2 and 5.10 of the EIAR screening report.

10.1 CONSTRUCTION PHASE

According to the IAQM guidance (IAQM, 2024) should the construction phase of the proposed development coincide with the construction phase of any other development within 350 m then there is the potential for cumulative construction dust impacts to nearby sensitive receptors.

There is the potential for cumulative construction dust impacts should the construction phases overlap with that of the proposed development. However, the dust mitigation measures outlined in Section 7.1 will be applied throughout the construction phase of the proposed development which will avoid significant cumulative impacts on air quality. With appropriate mitigation measures in place, the predicted cumulative impacts on air quality associated with the construction phase of the proposed development are deemed short-term, direct, localised, negative and slight.

10.2 OPERATIONAL PHASE

There is the potential for cumulative impacts to air quality during the operational phase due to traffic associated with other existing and permitted developments within the area. The traffic data provided for the operational stage air quality assessment included cumulative traffic. A conservative growth factor was applied to the traffic data to allow for cumulative development within the area in the wider context. In addition, specific cumulative developments were also investigated as part of the traffic assessment, but it was found that there were no specific permitted developments that would lead to cumulative traffic impacts due to their increased distance from the site (see Traffic Impact Assessment in Appendix F for further details). Therefore, the cumulative operational phase impact is assessed within Section 6.3 and was found to have a neutral impact on air quality. The cumulative operational stage impact is **long-term**, **localised, direct, neutral, imperceptible** and **non-significant**.

11.0 REFERENCES

BRE (2003) Controlling Particles, Vapours & Noise Pollution from Construction Sites

Department of Housing, Planning & Local Government (DHPLG) (2018) Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment

Department of the Environment Heritage and Local Government (DEHLG) (2004) Quarries and Ancillary Activities, Guidelines for Planning Authorities

Dublin City Council (2018) Air Quality Monitoring and Noise Control Unit's Good Practice Guide for Construction and Demolition

Environmental Protection Agency (2006) Environmental Management Guidelines - Environmental Management in the Extractive Industry (Non-Scheduled Minerals)

Environmental Protection Agency (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports

Environmental Protection Agency (2023) Air Quality Monitoring Report 2022 (& previous annual reports)

European Commission (2017) Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report

German VDI (2002) Technical Guidelines on Air Quality Control – TA Luft

Government of Ireland (2023) Clean Air Strategy for Ireland

Institute of Air Quality Management (IAQM) (2020) A Guide To The Assessment Of Air Quality Impacts On Designated Nature Conservation Sites (Version 1.1)

Institute of Air Quality Management (IAQM) (2024) Guidance on the Assessment of Dust from Demolition and Construction (Version 2.2)

Met Éireann (2023) Met Éireann website: https://www.met.ie/

The Scottish Office (1996) Planning Advice Note PAN50 Annex B: Controlling The Environmental Effects Of Surface Mineral Workings Annex B: The Control of Dust at Surface Mineral Workings

Transport Infrastructure Ireland (2022) Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106

Transport Infrastructure Ireland (2024) TII Road Emissions Model (REM): Model Development Report – GE-ENV-01107

UK Office of Deputy Prime Minister (2002) Controlling the Environmental Effects of Recycled and Secondary Aggregates Production Good Practice Guidance

USEPA (1997) Fugitive Dust Technical Information Document for the Best Available Control Measures

World Health Organisation (2006) Air Quality Guidelines - Global Update 2005 (and previous Air Quality Guideline Reports 1999 & 2000)

World Health Organisation (2021) Air Quality Guidelines 2021

APPENDIX E

Climate Assessment

ASHFORD PARK AND RIDE

CLIMATE

awnconsulting
A Trinity Consultants Company

CONTENTS

1.0 INTRODUCTION

This assessment considers the likely significant climate impacts associated with the Proposed Development, a 210 space Park and Ride facility, located at junction 16 on the M11, between Rathnew and Ashford, Co. Wicklow.

This assessment will provide an overview of the existing climate baseline, identify the relevant climate policies and guidelines, describe the sources of greenhouse gases (GHGs) associated with the proposed Project and potential impacts of the proposed Project, define mitigation measures that will be implemented to minimise the potential climate impacts, and define the residual effects of the proposed Project after the implementation of mitigation measures. The vulnerability of the proposed Project to climate change has also been considered.

1.1 Characteristics of the Proposed Project

The proposed Project will consist of the redevelopment of the site to provide for:

- Two hundred and ten (210) private car parking spaces including disabled and electric vehicle spaces.
- Bus-stops with passenger shelters.
- Good quality pedestrian and cycle infrastructure.
- A new site access junction onto the adjacent road to facilitate seamless access from/to the motorway.

A full description of the development is available in Chapter 2 (Description of the Proposed Project). The sections below outline the characteristics of the proposed Project as they relate to climate. The following describes the primary sources of potential climate impacts during the construction and operational phase.

1.1.1 Construction Phase

During the construction stage the main source of climate impacts will be as a result of GHG emissions and embodied carbon associated with the proposed construction materials and activities for the proposed P&R.

1.1.2 Operational Phase

During the operational phase vehicle emissions from traffic accessing the site has the potential to release CO_2 and other GHGs which will impact climate. In addition, the vulnerability of the proposed Project in relation to future climate change must be considered during the operational phase.

1.2 ASPECTS RELEVANT TO THIS ASSESSMENT

During the construction phase engine emissions from site vehicles and machinery have the potential to impact climate through the release of CO_2 and to a lesser extent, other greenhouse gases (GHGs). Embodied carbon of materials used in the construction of the development along with site activities will impact climate. Impacts to climate are assessed against Ireland's obligations under the EU 2030 GHG targets and sectoral emissions ceilings.

The climate assessment is divided into two distinct sections – a greenhouse gas assessment (GHGA) and a climate change risk assessment (CCRA).

- Greenhouse Gas Emissions Assessment (GHGA) – Quantifies the GHG emissions from a project over its lifetime. The assessment compares these emissions to relevant carbon budgets, targets and policy to contextualise magnitude.
- Climate Change Risk Assessment (CCRA) – Identifies the impact of a changing climate on a project and receiving environment. The assessment considers a projects vulnerability to climate change and identifies adaptation measures to increase project resilience.

The significance criteria for each assessment are described below.

2.0 METHODOLOGY

2.1 RELEVANT LEGISLATION, POLICY AND GUIDANCE

2.1.1 Legislation

In 2015, the Climate Action and Low Carbon Development Act 2015 (No. 46 of 2015) (Government of Ireland, 2015) was enacted (the 2015 Climate Act). The purpose of the Act was to enable Ireland '*to pursue, and achieve, the transition to a low carbon, climate resilient and environmentally sustainable economy by the end of the year 2050'* (3.(1) of No. 46 of 2015). This is referred to in the Act as the '*National Transition Objective*'. The 2015 Climate Act made provision for a national low carbon transition and mitigation plan (now known as a Climate Action Plan), and a national adaptation framework. In addition, the 2015 Climate Act provided for the establishment of the Climate Change Advisory Council with the function to advise and make recommendations on the preparation of the national mitigation and adaptation plans and compliance with existing climate obligations.

The first Climate Action Plan (CAP) was published by the Irish Government in June 2019 (Government of Ireland, 2019). The Climate Action Plan 2019 (CAP19) outlined the current status across key sectors including Electricity, Transport, Built Environment, Industry and Agriculture and outlined the various broadscale measures required for each sector to achieve ambitious decarbonisation targets. CAP19 also detailed the required governance arrangements for implementation including carbon-proofing of policies, establishment of carbon budgets, a strengthened Climate Change Advisory Council and greater accountability to the Oireachtas. The current Climate Action Plan is CAP24, published in December 2023 (DECC, 2024).

Following on from Ireland declaring a climate and biodiversity emergency in May 2019, and the European Parliament approving a resolution declaring a climate and environment emergency in Europe in November 2019, the Government published the Climate Action and Low Carbon Development (Amendment) Act 2021 (hereafter referred to as the 2021 Climate Act) in March 2021 (Government of Ireland, 2021). The 2021 Climate Act was signed into Law on the 23rd of July 2021, giving statutory effect to the core objectives stated within the first Climate Action Plan.

The purpose of the 2021 Climate Act is to provide for the approval of plans "to reduce the extent of further global warming, pursue and achieve, by no later than the end of the year 2050, the transition to a climate resilient, biodiversity rich, environmentally sustainable and climate neutral economy". This is known as the "national climate objective", which supersedes the 2015 Climate Act "national transition objective". The

2021 Climate Act will also "provide for carbon budgets and a decarbonisation target range for certain sectors of the economy". The 2021 Climate Act defines the carbon budget as "the total amount of greenhouse gas emissions that are permitted during the budget period".

In relation to carbon budgets, the 2021 Climate Action Act states "*A carbon budget, consistent with furthering the achievement of the national climate objective, shall be proposed by the Climate Change Advisory Council, finalised by the Minister and approved by the Government for the period of 5 years commencing on the 1 January 2021 and ending on 31 December 2025 and for each subsequent period of 5 years (in this Act referred to as a 'budget period')*". The carbon budget is to be produced for three sequential budget periods, as shown in Table 1. The carbon budget can be revised where new obligations are imposed under the law of the European Union or international agreements or where there are significant developments in scientific knowledge in relation to climate change. In relation to the sectoral emissions ceiling, the Minister for the Environment, Climate and Communications (the Minister for the Environment) shall prepare and submit to government the maximum amount of Greenhouse Gas (GHG) emissions that are permitted in different sectors of the economy during a budget period and different ceilings may apply to different sectors. The sectorial emission ceilings for 2030 were published in the Climate Action Plan 2024 (CAP"4) (DECC, 2024) and are shown in Table 2. Industry and Buildings (Residential) have a 35% and 40% reduction requirement respectively and a 2030 emission ceiling of 4 Mt $MtCO_2e$[1].

Table 1 *5-Year Carbon Budgets 2021-2025, 2026-2030 and 2031-2025*

Sector	Reduction Required	2018 Emissions ($MtCO_2e$)
2021-2025	295 Mt CO_2e	Reduction in emissions of 4.8% per annum for the first budget period.
2026-2030	200 Mt CO_2e	Reduction in emissions of 8.3% per annum for the second budget period.
2031-2035	151 Mt CO_2e	Reduction in emissions of 3.5% per annum for the third provisional budget.

[1] Mt CO_2e denotes million tonnes carbon dioxide equivalent.

Table 2 *Sectoral Emission Ceilings 2030*

Sector	Baseline ($MtCO_2e$)	Carbon Budgets ($MtCO_2e$)		2030 Emissions ($MtCO_2e$)	Indicative Emissions % Reduction in Final Year of 2025- 2030 Period (Compared to 2018)
	2018	2021-2025	2026-2030		
Transport	12	54	37	6	50
Electricity	10	40	20	3	75
Built Environment - Residential	7	29	23	4	40
Built Environment - Commercial	2	7	5	1	45
Agriculture	23	106	96	17.25	25
Industry	7	30	24	4	35
Other (F-gases, waste, petroleum refining)	2	9	8	1	50
Land Use, Land-use Change and Forestry (LULUCF)	5	Reflecting the continued volatility for LULUCF baseline emissions to 2030 and beyond, CAP24 puts in place ambitious activity targets for the sector reflecting an EU-type approach.			
Total	**68**				
Unallocated Savings	-	-	26	-5.25	-
Legally Binding Carbon Budgets and 2030 Emission Reduction Targets	**-**	**295**	**200**	**-**	**51**

2.1.2 Policy

In December 2023, current Climate Action plan CAP24 was published (DECC, 2024). CAP24 builds on the progress of CAP23, which first published carbon budgets and sectoral emissions ceilings, and it aims to implement the required changes to achieve a 51% reduction in carbon emissions by 2030 and 2050 net zero goal. CAP24 has six vital high impact sectors where the biggest savings can be made: renewable energy, energy efficiency of buildings, transport, sustainable farming, sustainable business and change of land-use. CAP24 states that the decarbonisation of Ireland's manufacturing industry is key for Ireland's economy and future competitiveness. There is a target to reduce the embodied carbon in construction materials by 10% for materials produced and used in Ireland by 2025 and by at least 30% for materials produced and used in Ireland by 2030. CAP24 states that these reductions can be brought about by product substitution for construction materials and reduction of clinker content in cement. Cement and other high embodied carbon construction elements can be reduced by the adoption of the methods set out in the Construction Industry Federation 2021 report Modern Methods of Construction. In order to ensure economic growth can continue alongside a reduction in emissions, the IDA Ireland will also seek to attract businesses to invest in decarbonisation technologies.

In April 2023 the Government published *Long-term Strategy on Greenhouse Gas Emissions Reductions* (DECC 2023). This strategy provides a long-term plan on how Ireland will transition towards net carbon zero by 2050, achieving the interim targets set out in the Climate Action Plan.

2.1.3 Guidance

The assessment of potential impacts on climate has been prepared in accordance with the most relevant principal guidance and best practice documents as follows:

- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 2018);
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022);
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017);
- GE-GEN-01101: Guide to the Implementation of Sustainability for Transport Infrastructure Ireland Projects (TII, 2023);
- PE-ENV-01104: Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document (TII, 2022a);
- PE-ENV-01105: Climate Assessment Standard for Proposed National Roads (TII, 2022b);
- GE-ENV-01106: TII Carbon Assessment Tool for Road and Light Rail Projects and User Guidance Document (TII, 2022c);
- Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (European Commission, 2013);
- 2030 Climate and Energy Policy Framework (European Commission, 2014);
- Technical guidance on the Climate Proofing of Infrastructure in the Period 2021-2027 (European Commission, 2021a).
- 2030 EU Climate Target Plan (European Commission, 2021b);
- Climate Action and Low Carbon Development (Amendment) Act 2021 (the 2021 Climate Act) (No. 32 of 2021) (Government of Ireland, 2021).
- Climate Action Plan 2024 (DECC, 2024);
- Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation (hereafter referred to as the IEMA 2020 EIA Guide) (IEMA, 2020a);
- GHG Management Hierarchy (hereafter referred to as the IEMA 2020 GHG Management Hierarchy) (IEMA, 2020b);
- Assessing Greenhouse Gas Emissions and Evaluating their Significance (Institute of Environmental Management & Assessment (IEMA), 2022);
- Environmental Impact Assessment Guide to: Assessing GHG Emissions and Evaluating their Significance (hereafter referred to as the IEMA GHG Guidance) (IEMA, 2022); and
- UK Design Manual for Roads and Bridges (DMRB) Volume 11 Environmental Assessment, Section 3 Environmental Assessment Techniques, Part 14 LA 114 Climate (Highways England, 2021).

2.2 GREENHOUSE GAS ASSESSMENT

As per the EU guidance document *Guidance on Integrating Climate Change and* Biodiversity into Environmental Impact Assessment (European Commission, 2013) the climate baseline is first established with reference to EPA data on annual GHG emissions (see Section 4.0).

2.2.1 Construction Phase

PE-ENV-01104 (TII, 2022a) recommends the calculation of the construction stage embodied carbon using the TII Online Carbon Tool (TII, 2022b). Embodied carbon refers to the sum of the carbon needed to produce a good or service. It incorporates the energy needed in the mining or processing of raw materials, the manufacturing of products and the delivery of these products to site. The TII Online Carbon Tool (TII, 2022b) uses emission factors from recognized sources including the Civil Engineering Standard Method of Measurement (CESSM) Carbon and Price Book database (CESSM, 2013), UK National Highways Carbon Tool v2.4 and UK Government 2021 Greenhouse Gas Reporting Conversion Factors. The tool aligns with PAS 2080. The carbon emissions are calculated by multiplying the emission factor by the quantity of the material that will be used over the entire construction / maintenance phase. This assessment includes the transport of materials and worker's travel.

The TII Online Carbon Tool (TII, 2022b) has been commissioned by TII to assess GHG emissions associated with road or rail projects in Ireland. The TII Carbon Tool (TII, 2022c) uses emission factors from recognised sources including the Civil Engineering Standard Method of Measurement (CESSM) Carbon and Price Book database (CESSM, 2013), which can be applied to a variety of developments, not just road or rail. The use of the TII carbon tool is considered appropriate as the material types and construction activities employed by the proposed development are accounted for in the tool. The carbon emissions are calculated by multiplying the emission factor by the quantity of the material that will be used over the entire construction / maintenance phase. The outputs are expressed in terms of tCO2e (tonnes of carbon dioxide equivalent).

Reasonable conservative estimates based on professional experience of similar developments have been used in this assessment where necessary to provide an estimate of the GHGs associated with the proposed development.

Information on the material quantities, site clearance activities, land clearance, excavations, fuel usage during construction, waste quantities and construction traffic (material, staff and waste transport) were provided by the design team for input into the TII carbon tool and are also discussed in Chapter 18 - Traffic and Transportation and Chapter 19 - Material Assets Waste. This information was used to determine an estimate of the GHG emissions associated with the development.

Embodied carbon is carbon dioxide emitted during the manufacture, transport and construction of building materials, together with site activities. As part of the proposed development, construction stage embodied GHG emissions have been calculated under the following headings within the TII Carbon Tool (TII, 2022c) where applicable:

- Pre-Construction;
- Embodied Carbon of Materials;
- Construction Activities;
- Construction Waste; and
- Maintenance.

Pre-construction includes land-use changes and site clearance activities which includes demolition of existing structures and alterations and partial demolition of the perimeter wall. There are no significant land-use changes associated with the proposed development.

Transport GHG emissions associated with delivery of materials to site and removal of waste materials off site were included in the calculator. In addition, construction worker travel to site was also included within the calculations. The exact location of all facilities to be used is not known at this stage, therefore an approximate radius from the site was used for the purposes of this assessment. Where specific locations were known the exact transport distance was included within the calculations.

2.2.2 Operational Phase

2.2.2.1 Operational Traffic Emissions

Emissions from road traffic associated with the proposed Project have the potential to emit carbon dioxide (CO_2) which will impact climate.

The Highways England DMRB guidance document in relation to climate impact assessments *LA 114 Climate* (Highways England, 2021) contains the following scoping criteria to determine whether a detailed climate assessment is required for a proposed project during the operational stage. If any of the road links impacted by the proposed Project meet or exceed the below criteria, then further assessment is required.

- A change of more than 10% in AADT;
- A change of more than 10% to the number of heavy-duty vehicles; and
- A change in daily average speed of more than 20 km/hr.

There are a small number of road links that will experience a change of over 10% in the AADT during the operational phase as a result of the proposed Project. As a result a detailed assessment of traffic related carbon dioxide (CO_2) emissions was conducted.

PE-ENV-01104 (TII, 2022a) states that road traffic related emissions information should be obtained from an Air Quality Practitioner to show future user emissions during operation without the development in place. The Air Quality Practitioner calculated the traffic related emissions through the use of the TII REM tool (TII, 2022c) which includes detailed fleet predictions for age, fuel technology, engine size and weight based on available national forecasts. The output is provided in terms of CO_2e for the base year 2022, opening year 2025 and design year 2040. Both the Do Nothing and Do Something scenarios are quantified in order to determine the degree of change in emissions as a result of the proposed Project.

Traffic data was obtained from Clifton Scannell Emerson Associates Consulting Engineers for the purpose of this assessment. Inputs include light duty vehicle (LDV) annual average daily traffic movements (AADT), annual average daily heavy-duty vehicles (HDV AADT), annual average traffic speeds, road link lengths, road type and project county location. Further details are provided in the Air Quality Appendix. The traffic data used in the operational phase modelling assessment is detailed in Table 3.

Table 3 Traffic Data used in Operational Phase Modelling Assessment

Road Name	Speed (kph)	Base Year 2022	Opening Year 2025		Design Year 2040	
			Do Nothing	Do Something	Do Nothing	Do Something
		LDV AADT (HDV AADT)	LDV AADT (HDV AADT)	LDV AADT (HDV AADT)	LDV AADT (HDV AADT)	LDV AADT (HDV AADT)
N11 North Ramp	80	5922 (339)	6003 (339)	6003 (373)	6003 (339)	6003 (373)
R772 East	80	12457 (631)	12826 (631)	13064 (719)	12826 (631)	13330 (719)
N11 South Ramp	120	1045 (112)	1045 (112)	1283 (146)	1045 (112)	1549 (146)
R772 West	50	8496 (375)	8783 (375)	9259 (551)	8783 (375)	9791 (551)
M11	120	46257 (2301)	48601 (2479)	48601 (2547)	52488 (3168)	52488 (3236)

2.2.3 *Operational Phase Energy Use*

The EU Guidance (European Commission, 2013) also states indirect GHG emissions as a result of a development must be considered, which includes emissions associated with energy usage. An Energy Statement was prepared by EDC Engineering in relation to the proposed development and is submitted separately with this planning application. The report outlines a number of measures which have been incorporated into the overall design of the development which will have the benefit of reducing the impact to climate where possible during operation. Information on some of the measures in relation to operational energy usage and sustainability measures has been supplied to inform the climate assessment.

2.2.4 *Significance Criteria for GHGA*

The Transport Infrastructure Ireland (TII) guidance document entitled *PE-ENV-01104 Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document* (TII, 2022a) outlines a recommended approach for determining the significance of both the construction and operational phases of a development.

The significance of GHG effects set out in PE-ENV-01104 (TII, 2022a) is based on IEMA guidance (IEMA, 2022) which is broadly consistent with the terminology contained within Figure 3.4 of the EPA's *'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports'* (EPA, 2022).

The 2022 IEMA Guidance (IEMA, 2022) sets out the following principles for significance:

- When evaluating significance, all new GHG emissions contribute to a negative environmental impact; however, some projects will replace existing development or baseline activity that has a higher GHG profile. The significance of a project's emissions should therefore be based on its net impact over its lifetime, which may be positive, negative or negligible;
- Where GHG emissions cannot be avoided, the goal of the EIA process should be to reduce the project's residual emissions at all stages; and

- Where GHG emissions remain significant, but cannot be further reduced, approaches to compensate the project's remaining emissions should be considered.

The criteria for determining the significance of effects are a two-stage process that involves defining the magnitude of the impacts and the sensitivity of the receptors (i.e. Ireland's National GHG targets). In relation to climate, there is no project specific assessment criteria, but the project will be assessed against the recommended IEMA significance determination. This takes account of any embedded or committed mitigation measures that form part of the design which should be considered.

TII (TII, 2022a) states that professional judgement must be taken into account when contextualising and assessing the significance of a project's GHG impact. In line with IEMA Guidance (IEMA, 2022), TII state that the crux of assessing significance is "*not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero*[2] *by 2050*".

Significance is determined using the criteria outlined in Table 4 (derived from Table 6.7 of PE-ENV-01104 (TII, 2022a)) along with consideration of the following two factors:

- The extent to which the trajectory of GHG emissions from the project aligns with Ireland's GHG trajectory to net zero by 2050; and
- The level of mitigation taking place.

Table 4 *GHGA Significance Criteria*

Effects	Significance level Description	Description
Significant adverse	Major adverse	• The project's GHG impacts are not mitigated. • The project has not complied with do-minimum standards set through regulation, nor provided reductions required by local or national policies; and • No meaningful absolute contribution to Ireland's trajectory towards net zero.
	Moderate adverse	• The project's GHG impacts are partially mitigated. • The project has partially complied with do-minimum standards set through regulation, and have not fully complied with local or national policies; and • Falls short of full contribution to Ireland's trajectory towards net zero.
Not significant	Minor adverse	• The project's GHG impacts are mitigated through 'good practice' measures. • The project has complied with existing and emerging policy requirements; and • Fully in line to achieve Ireland's trajectory towards net zero.

[2] Net Zero: "*When anthropogenic emissions of greenhouse gases to the atmosphere are balanced by anthropogenic removals over a specified period.*" Net zero is achieved where emissions are first educed in line with a 'science-based' trajectory with any residual emissions neutralised through offsets.

Effects	Significance level Description	Description
	Negligible	• The project's GHG impacts are mitigated beyond design standards. • The project has gone well beyond existing and emerging policy requirements; and • Well 'ahead of the curve' for Ireland's trajectory towards net zero.
Beneficial	Beneficial	• The project's net GHG impacts are below zero and it causes a reduction in atmosphere GHG concentration. • The project has gone well beyond existing and emerging policy requirements; and • Well 'ahead of the curve' for Ireland's trajectory towards net zero, provides a positive climate impact.

Ireland's carbon budgets can also be used to contextualise the magnitude of GHG emissions from the proposed development (TII, 2022a). The approach is based on comparing the net proposed development GHG emissions to the relevant carbon budgets (DECC, 2024). With the publication of the Climate Action Act in 2021 and CAP24, sectoral carbon budgets have been published for comparison with the net GHG emissions from the proposed development over its lifespan. The relevant sector budgets are the Industry Buildings (Residential) sector, Transport sector, Electricity sector and Waste sector. The Industry and Buildings (Residential) sectors each emitted approximately 7 Mt CO_2e in 2018 and have a ceiling of 4 Mt CO_2e in 2030 which is a 35% and 40% reduction respectively over this period (see Table 2). The Transport sector emitted approximately 12 MtCO_2e in 2018 and has a ceiling of 6 Mt CO_2e in 2030 which is a 50% reduction over this period.

2.3 CLIMATE CHANGE RISK ASSESSMENT

The assessment involves determining the vulnerability of the proposed Project to climate change. This involves an analysis of the sensitivity and exposure of the development to climate hazards which together provide a measure of vulnerability.

PE-ENV-01104 (TII, 2022a) states that the CCRA is guided by the principles set out in the overarching best practice guidance documents:

- Technical guidance on the climate proofing of Infrastructure in the Period 2021-2027 (European Commission, 2021a); and
- The Institute of Environmental Management and Assessment, Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation (2nd Edition) (IEMA, 2020).

The baseline environment information provided in Section 4.0, future climate change modelling and input from other experts working on the proposed Project (i.e. hydrologists) should be used in order to assess the likelihood of a climate risk.

First an initial screening CCRA based on the operational phase is carried out, according to the TII guidance PE-ENV-01104. This is carried out by determining the sensitivity of proposed development assets (i.e. receptors) and their exposure to climate change hazards.

The proposed development asset categories must be assigned a level of sensitivity to climate hazards. PE-ENV-01104 (TII, 2022a) provides the below list of asset categories and climate hazards to be considered. The asset categories will vary for development type and need to be determined on a development by development basis.

- **Asset Categories** Pavements; drainage; structures; utilities; landscaping; signs, light posts, buildings, and fences.

- **Climate Hazards** Flooding (coastal, pluvial, fluvial); extreme heat; extreme cold; wildfire; drought; extreme wind; lightning and hail; landslides; fog.

The sensitivity is based on a High, Medium or Low rating with a score of 1 to 3 assigned as per the criteria below.

- **High Sensitivity** The climate hazard will or is likely to have a major impact on the asset category. This is a sensitivity score of 3.

- **Medium Sensitivity** It is possible or likely the climate hazard will have a moderate impact on the asset category. This is a sensitivity score of 2.

- **Low Sensitivity** It is possible the climate hazard will have a low or negligible impact on the asset category. This is a sensitivity score of 1.

Once the sensitivities have been identified the exposure analysis is undertaken. The exposure analysis involves determining the level of exposure of each climate hazard at the project location irrespective of the project type for example: flooding could be a risk if the project location is next to a river in a floodplain. Exposure is assigned a level of High, Medium or Low as per the below criteria.

- **High Exposure** It is almost certain or likely this climate hazard will occur at the project location i.e. might arise once to several times per year. This is an exposure score of 3.

- **Medium Exposure** It is possible this climate hazard will occur at the project location i.e. might arise a number of times in a decade. This is an exposure score of 2.

- **Low Exposure** It is unlikely or rare this climate hazard will occur at the project location i.e. might arise a number of times in a generation or in a lifetime. This is an exposure score of 1.

Once the sensitivity and exposure are categorised, a vulnerability analysis is conducted by multiplying the sensitivity and exposure to calculate the vulnerability, as shown in Table 5.

2.3.1.1 Significance Criteria for CCRA

The CCRA involves an initial screening assessment to determine the vulnerability of the proposed Project to various climate hazards. The vulnerability is determined by combining the sensitivity and the exposure of the proposed Project to various climate hazards. The vulnerability assessment takes any proposed mitigation into account.

Vulnerability = Sensitivity x Exposure

Table 5 details the vulnerability matrix; vulnerabilities are scored on a high, medium and low scale. A risk that is low or medium is classed as non-significant, while a high or extreme risk is classed as a significant risk.

TII guidance (TII, 2022a) and the EU technical guidance (European Commission, 2021a) note that if all vulnerabilities are ranked as low in a justified manner, no detailed climate risk assessment may be needed. The impact from climate change on a development would therefore be considered not significant.

Where residual medium or high vulnerabilities exist the assessment may need to be progressed to a detailed climate change risk assessment and further mitigation implemented to reduce risks. An assessment of construction phase CCRA impacts is only required according to the TII guidance (TII, 2022a) if a detailed CCRA is required.

Table 5 *Vulnerability Matrix*

		Exposure		
		High (3)	Medium (2)	Low (1)
Sensitivity	High (3)	9 - High	6 – High	3 - Medium
	Medium (2)	6 - High	4 - Medium	2 - Low
	Low (1)	3 - Medium	2 – Low	1 - Low

The screening CCRA, detailed in Section 5.1.3, did not identify any residual medium or high risks to the proposed development as a result of climate change. Therefore, a detailed CCRA for the construction and operational phase were scoped out.

While a CCRA for the construction phase was not required, best practice mitigation against climate hazards is still recommended in Section 6.1.1.

3.0 DIFFICULTIES IN COMPILING THE ASSESSMENT

There were no significant difficulties encountered in compiling the specified information for this assessment.

4.0 RECEIVING ENVIRONMENT

PE-ENV-01104 (TII, 2022a) states that a baseline climate scenario should identify, consistent with the study area for the project, GHG emissions without the project for both the current and future baseline.

Ireland declared a climate and biodiversity emergency in May 2019 and in November 2019 there was European Parliament approval of a resolution declaring a climate and environment emergency in Europe. This, in addition to Ireland's current failure to meet its EU binding targets under Regulation 2018/842 (European Union, 2018) results in changes in GHG emissions either beneficial or adverse being of more significance than previously considered prior to these declarations.

4.1 CURRENT GHGA BASELINE

Data published in May 2024 (EPA, 2024) indicates that Ireland exceeded (without the use of flexibilities) its 2022 annual limit set under EU's Effort Sharing Decision (ESD) (EU 2018/842) by 3.54 Mt CO_2e. When the available flexibilities are taken into account, Ireland is in compliance with the 2022 ESR limit with an emissions surplus of 1.05 Mt CO_2e (EPA, 2024). The sectoral breakdown of 2023 GHG emissions is shown in Table 6. The sector with the highest emissions in 2023 was agriculture at 36% of the total, followed by transport at 19%. For 2023 total national emissions (excluding LULUCF) were estimated to be 57.4 Mt CO_2e as shown in Table 6 (EPA, 2024).

Table 6 *Total National GHG Emissions in 2023 (EPA, 2024)*

Sector	2022 Emissions (Mt CO_2e)	2023 Emissions (Mt CO_2e)	% Total 2023 (including LULUCF)	% Change from 2022 to 2023
Agriculture	23.357	22.997	36%	-1.5%
Transport	11.751	11.782	19%	0.3%
Energy Industries	10.078	7.513	12%	-25.5%
Residential	5.787	5.793	9%	0.1%
Manufacturing Combustion	4.302	4.167	7%	-3.1%
Industrial Processes	2.288	2.179	3%	-4.8%
F-Gases	0.741	0.728	1%	-1.8%
Commercial/Public Services	1.422	1.386	2%	-2.5%
Waste Note 1	0.878	0.849	1%	-3.3%
LULUFC	3.983	5.614	9%	40.9%
National Total Excluding LULUFC	**60.605**	**57.394**	**91%**	**-5.3%**
National Total Including LULUFC	**64.588**	**63.008**	**100%**	**-2.4%**

Note 1 Waste includes emissions from solid waste disposal on land, solid waste treatment (composting and anaerobic digestion), wastewater treatment, waste incineration and open burning of waste.

4.2 FUTURE GGHA BASELINE

The future baseline with respect to the GHGA can be considered in relation to the future climate targets which the assessment results will be compared against. In line with TII (TII, 2022c) and IEMA Guidance (IEMA, 2022) the future baseline is a trajectory towards net zero by 2050, "*whether it* [the project] *contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050*".

The future baseline will be determined by Ireland meeting its targets set out in the CAP23, and future CAPs, alongside binding 2030 EU targets. In order to meet the commitments under the Paris Agreement, the European Union (EU) enacted *'Regulation (EU) 2018/842 on binding annual GHG emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No. 525/2013'* (hereafter referred to as the Regulation) (European Union, 2018). The Regulation aims to deliver, collectively by the EU in the most cost-effective manner possible, reductions in GHG emissions from the Emission Trading Scheme (ETS) and non-ETS sectors amounting to 43% and 30%, respectively, by 2030 compared to 2005. The Regulation was amended in April 2023 and Ireland must now limit its greenhouse gas emissions by at least 42% by 2030. The ETS is an EU-wide scheme which regulates the GHG emissions of larger industrial emitters including electricity generation, cement manufacturing and heavy industry. The non-ETS sector includes all domestic GHG emitters which do not fall under the ETS scheme and thus includes GHG emissions from transport, residential and commercial buildings and agriculture.

4.3 CURRENT CCRA BASELINE

The region of the proposed development has a temperate, oceanic climate, resulting in mild winters and cool summers. The Met Éireann weather station at Dublin Airport is the nearest weather and climate monitoring station to the proposed development with meteorological data recorded for the 30-year period from 1991 to 2020. The historical regional weather data for Dublin Airport Metrological station is representative of the current climate in the region of the proposed development. The data for the 30-year period from 1991 to 2020 (Met Éireann, 2023a) indicates that the wettest months at Dublin Airport Metrological Station were November and December, and the driest month on average was June. July was the warmest month with a mean temperature of 15.4 Celsius. January was the coldest month with a mean temperature of 5.2 Celsius.

Met Éireann's 2023 Climate Statement (Met Éireann, 2023a) states 2023's average shaded air temperature in Ireland is provisionally 11.20 °C, which is 1.65°C above the 1961-1990 long-term average. Previous to this 2022 was the warmest year on record, however 2023 was 0.38 °C warmer (see Figure 1).

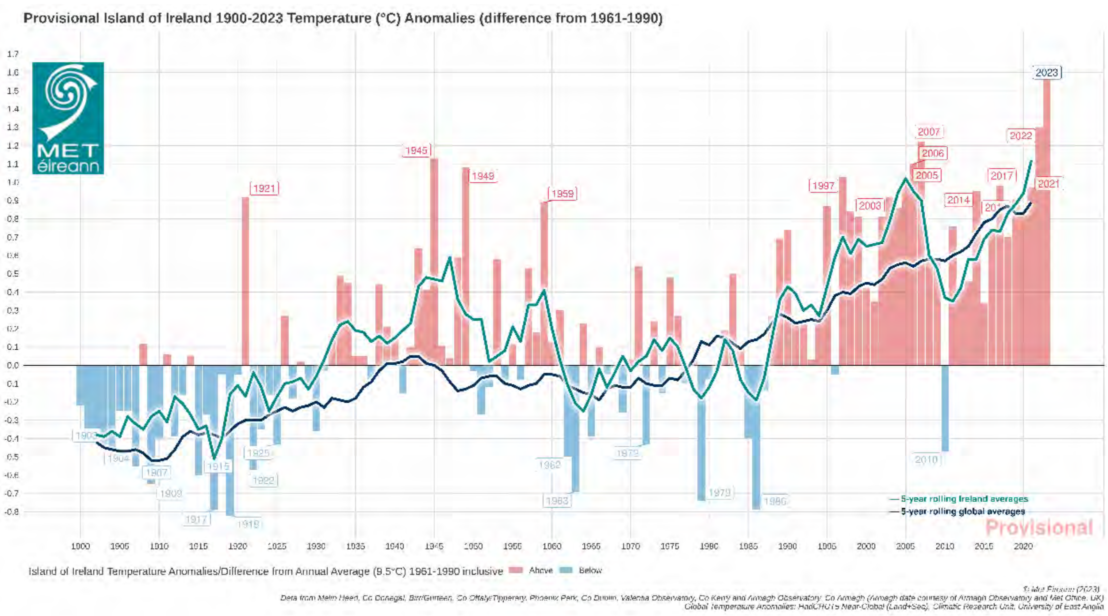


Figure 1 *1900-2023 Temperature (°C) Temperature Anomalies (Differences from 1961-1990)*

The year 2023 also had above average rainfall, this included the warmest June on record and the wettest March and July on record. Record high sea surface temperatures (SST) were recorded since April 2023 which included a severe marine heatwave[3] to the west of Ireland during June 2023. This marine heatwave contributed to the record rainfall in July.

[3] https://www.met.ie/marine-heat-wave-2023-a-warning-for-the-future

Recent weather patterns and records of extreme weather events recorded by Met Éireann have been reviewed. Considering the extraordinary 2023 data, Met Éireann states that the latest Irish climate change projections indicate further warming in the future, including warmer winters. The record temperatures means the likelihood of extreme weather events occurring has increased. This will result in longer dry periods and heavy rainfall events. Storm surges and coastal flooding due to sea level rise. Compound events, where coastal surges and extreme rainfall events occur simultaneously will also increase. Met Éireann has high confidence in maximum rainfall rates increasing but not in how the frequency or intensity of storms will change with climate change.

4.4 FUTURE CCRA BASELINE

Impacts as a result of climate change will evolve with a changing future baseline, changes have the potential to include increases in global temperatures and increases in the number of rainfall days per year. Therefore, it is expected that the baseline climate will evolve over time and consideration is needed with respect to this within the design of the proposed Project.

Ireland has seen increases in the annual rainfall in the north and west of the country, with small increases or decreases in the south and east including in the region where the proposed Project will be located (EPA, 2021b). The EPA have compiled a list of potential adverse impacts as a result of climate change including the following which may be of relevance to the proposed Project (EPA, 2021a):

- More intense storms and rainfall events;
- Increased likelihood and magnitude of river and coastal flooding;
- Water shortages in summer in the east;
- Adverse impacts on water quality; and
- Changes in distribution of plant and animal species.

The EPA's State of the Irish Environment Report (Chapter 2: Climate Change) (EPA, 2020a) notes that projections show that full implementation of additional policies and measures, outlined in the 2019 Climate Action Plan, will result in a reduction in Ireland's total GHG emissions by up to 25% by 2030 compared with 2020 levels. Climate change is not only a future issue in Ireland, as a warming of approximately 0.8°C since 1900 has already occurred. The EPA state that it is critically important for the public sector to show leadership and decarbonise all public transport across bus and rail networks to the lowest carbon alternatives. The report (EPA, 2020a) underlines that the next decade needs to be one of major developments and advances in relation to Ireland's response to climate change in order to achieve these targets and that Ireland must accelerate the rate at which it implements GHG emission reductions. The report states that mid-century mean annual temperatures in Ireland are projected to increase by between 1.0°C and 1.6°C (subject to the emissions trajectory). In addition, heat events are expected to increase by mid-century (EPA, 2020a). While individual storms are predicted to have more severe winds, the average wind speed has the potential to decrease (EPA, 2020a).

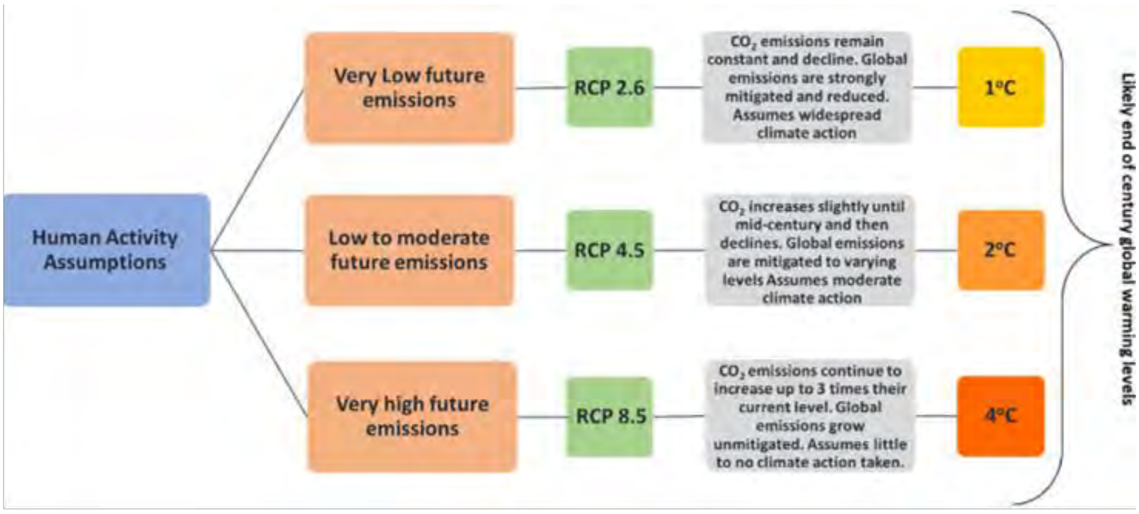
TII's Guidance document PE-ENV-01104 (TII, 2022a) states that for future climate change a moderate to high Representative Concentration Pathways (RCP) should be adopted. RPC4.5 is considered moderate while RPC8.5 is considered high. Representative Concentration Pathways (RCPs) describe different 21st century pathways of GHG emissions depending on the level of climate mitigation action undertaken.

Future climate predictions undertaken by the EPA have been published in *'Research 339: High-resolution Climate Projections for Ireland – A Multi-model Ensemble Approach'* (EPA, 2020b). The future climate was simulated under both Representative Concentration Pathway 4.5 (RCP4.5) (medium-low) and RCP8.5 (high) scenarios. This study indicates that by the middle of this century (2041–2060). Mid-century mean annual temperatures are projected to increase by 1 to 1.2°C and 1.3 to 1.6°C for the RCP4.5 and RCP8.5 scenarios, respectively, with the largest increases in the east. Warming will be enhanced at the extremes (i.e. hot days and cold nights), with summer daytime and winter night-time temperatures projected to increase by 1 to 2.4°C. There is a projected substantial decrease of approximately 50% for the number of frost and ice days. Summer heatwave events are expected to occur more frequently, with the largest increases in the south. In addition, precipitation is expected to become more variable, with substantial projected increases in the occurrence of both dry periods and heavy precipitation events. Climate change also has the potential to impact future energy supply which will rely on renewables such as wind and hydroelectric power. Wind turbines need a specific range of wind speeds to operate within and droughts or low ground water levels may impact hydroelectric energy generating sites. More frequent storms have the potential to damage the communication networks requiring additional investment to create resilience within the network.

The EPA's Critical Infrastructure Vulnerability to Climate Change report (EPA, 2021b) assesses the future performance of Irelands critical infrastructure when climate is considered. With respect to road infrastructure, fluvial flooding and coastal inundation/coastal flooding are considered the key climate change risks with snowstorm and landslides being medium risks. Extreme winds and heatwaves/droughts are considered low risk to road infrastructure. One of the key outputs of the research was a framework that will provide quantitative risk-based decision support for climate change impacts and climate change adaptation analysis for infrastructure.

National Framework for Climate Services (NFCS) was founded in June 2022 to streamline the provision of climate services in Ireland and will be led by Met Éireann. The aim of the NFCS is to enable the co-production, delivery and use of accurate, actionable and accessible climate information and tools to support climate resilience planning and decision making. In addition to the NFCS, further work has been ongoing into climate projects in Ireland through research under the TRANSLATE project. TRANSLATE (Met Éireann, 2023) has been led by climate researchers from University of Galway – Irish Centre for High End Computing (ICHEC), and University College Cork – SFI Research Centre for Energy, Climate and Marine (MaREI), supported by Met Éireann climatologists. TRANSLATE's outputs are produced using a selection of internationally reviewed and accepted models from both CORDEX and CMIP5. Representative Concentration Pathways (RCPs) provide a broad range of possible futures based on assumptions of human activity. The modelled scenarios include for "least" (RCP2.6), "more" (RCP4.5) or "most" (RCP8.5) climate change, see Figure 2.

Figure 2 *Representative Concentration Pathways associated emission levels*



*Source: TRANSLATE Project Storymap (*Met Éireann *2023)*

TRANSLATE (Met Éireann, 2023) provides the first standardised and bias-corrected national climate projections for Ireland to aid climate risk decision making across multiple sectors (for example, transport, energy, water), by providing information on how Ireland's climate could change as global temperatures increase to 1.5˚C ,2˚C, 2.5˚C, 3˚C or 4˚C (Figure 3). Projections broadly agree with previous projections for Ireland. Ireland's climate is dominated by the Atlantic Meridional Overturning Circulation (AMOC), a large system of ocean currents – including the Gulf Stream – characterised by a northward flow of warm water and a southward flow of cold water. Due to the AMOC, Ireland does not suffer from the extremes of temperature experienced by other countries at a similar latitude. Recent studies have projected that the AMOC could decline by 30 – 40 % by 2100, resulting in cooler North Atlantic Sea surface temperatures (SST)s (Met Éireann, 2023). Met Éireann projects that Ireland will nevertheless continue to warm, although the AMOC cooling influence may lead to reduced warming compared with continental Europe. AMOC weakening is also expected to lead to additional sea level rise around Ireland. With climate change Ireland's temperature and rainfall will undergo more and more significant changes e.g. on average summer temperature could increase by more than 2°C, summer rainfall could decrease by 9% while winter rainfall could increase by 24%. Future projects also include a 10-fold increase in the frequency of summer nights (values > 15°C) by the end of the century, a decrease in the frequency of cold winter nights and an increase in the number of heatwaves. A heatwave in Ireland is defined as a period of 5 consecutive days where the daily maximum temperature is greater than 25°C.

Figure 3 *Change of climate variables for Ireland for different Global warming thresholds*

*Source: TRANSLATE Project Storymap (*Met Éireann, *2023)*

5.0 POTENTIAL IMPACTS OF THE PROPOSED PROJECT

5.1.1 Do Nothing Scenario

Under the Do-Nothing Scenario no demolition or construction works will take place and the site will remain as it currently is. The climate baseline will continue to develop in line with the identified trends (see Section 4.0). This scenario is considered neutral in relation to climate.

5.1.2 Construction Phase

5.1.2.1 Greenhouse Gas Assessment

There is the potential for the release of a number of greenhouse gas emissions to the atmosphere during the construction of the proposed Project.

The embodied carbon within the construction materials has been calculated. This calculation was based on the online TII Carbon tool (TII, 2022b) and the breakdown of the activities between the different phases of the proposed Project has been assessed. As shown in Table 7, the assessment indicates that the key sources of GHG emissions are associated with the embodied carbon of the construction materials and construction waste.

The proposed Project is estimated to result in total construction phase GHG emissions of 2,918 tonnes embodied CO_2e for the product and construction processes and maintenance over a 60-year lifecycle. The majority of the embodied carbon relates to road surfacing materials and its ongoing maintenance. This is equivalent to an annualised total of 0.07% of the 2030 industrial sector budget or 0.0021% when annualised over the lifespan of the proposed Project.

In line with TII (TII, 2022a) and IEMA guidance (IEMA, 2022), the impact of GHG emissions associated with a proposed development on climate should be assessed over its lifetime, rather than for individual phases. The overall impact of the

Proposed Scheme on climate due to GHG emissions is therefore discussed in Section 6.0, where the Operational Phase and mitigation is also taken into account.

Table 7 *Construction Stage Greenhouse Gas Emissions*

Activity	**Tonnes CO_2e**
Pre-Construction	0.7
Embodied Carbon	2865.2
Construction Activities	50.0
Construction Waste	2.6
Total	2,918
As % of 2030 industrial sectoral budget	0.07%
As % of 2030 industrial sectoral budget (annualised over 60 years)	0.0012%

5.1.2.2 <u>Climate Change Risk Assessment</u>

Examples of potential climate impacts during operation are included in Annex D (Climate proofing and environmental impact assessment) of the technical guidance on the climate proofing of infrastructure (European Commission, 2021a). Potential impacts of climate change of the proposed Project include:

- Flood Risk due to increased precipitation, and intense periods of rainfall. This includes fluvial and pluvial flooding;
- Increased temperatures potentially causing drought, wildfires and prolonged periods of hot weather;
- Reduced temperatures resulting in ice or snow;
- Geotechnical impacts; and
- Major Storm Damage – including wind damage.

Each of these potential risks are considered with respect to the operational phase of the proposed Project as detailed in Section 5.1.3.2. During the construction phase no assessment is required however consideration will be given to the project's vulnerability to climate impacts. During construction, the Contractor will be required to mitigate against the effects of extreme rainfall / flooding through site risk assessments and method statements. The Contractor will also be required to mitigate against the effects of extreme wind / storms, temperature extremes through site risk assessments and method statements. All materials used during construction will be accompanied by certified datasheets which will set out the limiting operating temperatures. Temperatures can affect the performance of some materials, and this will require consideration during construction.

During construction, the Contractor will be required to mitigate against the effects of fog, lighting and hail through site risk assessments and method statements.

5.1.3 Operational Phase

5.1.3.1 <u>Climate and Traffic Emissions</u>

There is the potential for increased traffic volumes to impact climate. The change in traffic was reviewed against the DMRB screening criteria outlined in Section 2.2.2.1

(UK Highways Agency, 2019) and a detailed climate assessment of traffic emissions was conducted.

The predicted concentrations of CO_2 for the future years of 2025 and 2040 are detailed in Table 8. These are significantly less than the 2025 and 2030 targets set out under EU legislation (targets beyond 2030 are not available). It is predicted that in 2024 the proposed Project will decrease CO_2 emissions by 0.00036% of the EU 2025 target. Similarly low decreases in CO_2 emissions are predicted to occur in 2040 with emissions decreasing by 0.00048% of the EU 2030 target. however, it should be noted that these emission changes are only associated with the roads in close proximity to the P&R and therefore do not indicate the full extent of the potential benefits of the proposed P&R. The modal shift to from private vehicles to public transport at the P&R is likely to have a beneficial impact if emissions across a wider area are considered.

Table 8 *Climate Traffic Impact Assessment*

Year	Scenario	CO_2e (tonnes/annum)
2024	Do Nothing	9,448
	Do Something	9,588
2039	Do Nothing	9,547
	Do Something	9,706
Increment in 2024		139
Increment in 2039		159
Emission Ceiling (Tonnes) 2024		38,991,362
Emission Ceiling (Tonnes) 2030		33,381,312
Impact in 2024 (%)		0.00036%
Impact in 2039 (%)		0.00048%

Note 1 Target under *Regulation (EU) 2018/842 of the European Parliament and of the Council of 30 May 2018 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No 525/2013*

5.1.3.2 Climate Change Vulnerability Assessment

In order to determine the vulnerability of the proposed Project to climate change the sensitivity and exposure of the development to various climate hazards must first be determined. The following climate hazards have been considered in the context of the proposed Project: flooding (coastal, pluvial, fluvial); extreme heat; extreme cold; wildfire; drought; extreme wind; lightning, hail, landslides and fog. Wildfire and landslides were not considered relevant to the proposed Project due to the project location and have been screened out of the assessment.

The sensitivity of the proposed Project to the above climate hazards is assessed irrespective of the project location. Table 9 details the sensitivity of the proposed Project on a scale of high (3), medium (2) and low (1). Once the sensitivity has been established the exposure of the proposed Project to each of the climate hazards is determined, this is the likelihood of the climate hazard occurring at the project location and is also scored on a scale of high (3), medium (2) and low (1). The product of the sensitivity and exposure is then used to determine the overall vulnerability of the proposed Project to each of the climate hazards as per Table 5. The results of the vulnerability assessment are detailed in Table 9 below.

Table 9 *Climate Change Vulnerability Assessment*

Climate Hazard	Sensitivity	Exposure	Vulnerability
Flooding (coastal, pluvial, fluvial)	2 (Medium) for Earthworks and Drainage	1 (Low)	2 (Low Risk)
Extreme Heat	1 (Low)	2 (Medium)	2 (Low Risk)
Extreme Cold	1 (Low)	2 (Medium)	2 (Low Risk)
Wildfire	1 (Low)	1 (Low)	1 (Low Risk)
Drought	2 (Medium) for Landscape	2 (Medium)	4 (Medium Risk)
Extreme Wind	1 (Low)	2 (Medium)	2 (Low Risk)
Lightning & Hail	1 (Low)	1 (Low)	1 (Low Risk)
Landslides	1 (Low)	1 (Low)	1 (Low Risk)
Fog	1 (Low)	1 (Low)	1 (Low Risk)

The sensitivity and exposure of the area was determined with reference to a number of online tools and with input from the various discipline specialists on the project team. It was concluded that proposed development does not have any significant vulnerabilities to the identified climate hazards as described in the below sections.

5.1.3.2.1 Extreme Temperatures (Heat & Cold) & Drought

There is a medium risk with respect to drought due to the vulnerability of landscaping at the site to be impacted by extreme cold or drought conditions. The site is predicted to have a medium exposure to extreme heat, cold, drought in high-risk future climate scenarios.

In relation to extreme temperatures, both extreme heat and extreme cold, these have the potential to impact the proposed Project infrastructure. However, high quality, durable materials will be selected for the proposed Project to reduce the maintenance required due to impacts from freeze/thaw actions due to low temperatures. Residual risks will be reviewed during detailed design to ensure mitigation is robust. In addition, the TII Climate Adaptation Strategy 2022 and Department of Transport’s Climate Change Sectoral Adaptation Plan, including future iterations, will ensure that resilience to climate vulnerabilities are considered during the operational phase of the proposed Project.

5.1.3.2.2 Flooding

A flood risk assessment conducted for the proposed location notes that the probability of flooding from rivers and the sea is low (less than 1:1000) for both river and coastal flooding which would be equivalent to Flood Zone C. The risks of flooding are low and the assessment concludes that the surface water discharge from the site does not adversely affect or increase the flood risk to adjacent or downstream sites.

The drainage design will account for a 20% increase in flows for all return periods up to 100 years. The drainage design will factor all rainfall intensities by 1.1 to account for a 10% increase in design rainfall. Additionally, the time series rainfall will be modified in accordance with the Greater Dublin Strategic Drainage Study climate change policy document to ensure that the drainage system is designed to handle the projected rainfall patterns.

The proposed Project will be drained with the help of a traditional gully and piped drainage system into an underground attenuation tank that will ultimately be discharged into the existing storm water network on R772. Unlike above-ground water tanks, which are exposed to changing weather conditions throughout the year, underground systems like the proposed one are less susceptible to extreme cold spells. The hydrobrake in the tank will control the release of excess rainwater at a controlled rate, minimizing the risk of freezing.

5.1.3.2.3 Landslide

The GSI landslide susceptibility mapping database (GSI, 2023) was reviewed in order to determine the risk from landslides at the proposed development. There have not been any historical landslide events in the vicinity of the proposed development and the area has a low susceptibility to future landslides. Therefore, landslides are not a risk for the proposed development site.

5.1.3.2.4 Extreme Wind, Fog, Lightning & Hail

In relation to extreme winds, the appropriate wind loadings are to be calculated in line with the relevant structure requirements (e.g. signage and lamp poles). The EPA published Ireland's Climate Change Assessment Synthesis Report Volume 1 (EPA 2024c) in early 2024 which states that there is a likely reduction in mean average wind speeds and an increase in wind variability. However any increase in variability or storminess have not been able to be comprehensively assessed to date and projections require further assessment by the EPA or other agencies.

Lightning and hail are not deemed to pose an unusual risk to the structure.

Fog can obscure visibility of signs, light posts, and fences, reducing their effectiveness and potentially causing hazards for motorists and pedestrians however reflective designs and actions taken by drivers to reduce speeds in such scenarios are put in place to ensure risks are low as it is an adverse event that can be absorbed by taking business continuity actions.

5.1.3.2.5 Wildfire

In relation to wildfires, the *Think Hazard!* tool developed by the Global Facility for Disaster Reduction and Recovery (GFDRR, 2024), indicates that the wildfire hazard is classified as low for the Wicklow County area. This means that there is between a 4% to 10% chance of experiencing weather that could support a hazardous wildfire that may pose some risk of life and property loss in any given year. Future climate modelling indicates that there could be an increase in the weather conditions which are favourable to fire conditions, these include increases in temperature and prolonged dry periods. However, as the project location is not in an area of the road network, the risk of wildfire is significantly lessened. It can be concluded that the proposed development is of low vulnerability to wildfires.

Wildfire may cause issues with pavement softening due to extreme heat conditions however this would be classed as an adverse event that may require repair work, however it is unlikely to require emergency repair works

6.0 REMEDIAL AND MITIGATION MEASURES

6.1.1 Construction Phase

The construction traffic and the embodied energy of construction materials will be the dominant source of GHG emissions as a result of the Construction Phase of the proposed development. During the construction phase the following best practice measures shall be implemented on site to prevent significant GHG emissions and reduce impacts to climate:

- Alignment with requirements under the Local and National Climate Action Plan;
- Where possible, adoption of the methods set out in the Construction Industry Federation 2021 report Modern Methods of Construction.
- Creating a construction program which allows for sufficient time to determine reuse and recycling opportunities for construction wastes;
- Materials will be reused on site where possible;
- Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods;
- Ensure all plant and machinery are well maintained and inspected regularly;
- Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site;
- Material choices and quantities will be reviewed during detailed design, to identify and implement lower embodied carbon options where feasible;
- Sourcing materials locally where possible to reduce transport related CO_2 emissions; and
- The project shall review and determine compliance with the requirements set out in the EU Taxonomy Regulation (Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment and amending Regulation (EU) 2019/2088 in relation to circular economy. This is specific to reuse, recycling and material recovery of demolition and construction wastes.

The construction traffic GHG emissions associated with the Construction Phase of the proposed development will be short-term and temporary in nature. The appointed contractor will develop a Construction Traffic Management Plan (CTMP) to manage traffic during the Construction Phase.

In addition, during construction the Contractor will be required to mitigate against the effects of extreme rainfall/flooding through site risk assessments and method statements. The Contractor will also be required to mitigate against the effects of extreme wind/storms, temperature extremes through site risk assessments and method statements. All materials used during construction will be accompanied by certified datasheets which will set out the limiting operating temperatures. Temperatures can affect the performance of some materials, and this will require consideration during construction. During construction, the Contractor will be required to mitigate against the effects of fog, lighting and hail through site risk assessments and method statements

6.1.2 Operational Phase

A number of measures have been incorporated into the design of the development in order to mitigate against the impacts of future climate change. For example, adequate attenuation and drainage have been incorporated into the design of the development to avoid potential flooding impacts as a result of increased rainfall events in future years. These measures have been considered when assessing the vulnerability of the proposed Project to climate change (see Section 5.1.3.2).

All lighting uses energy-efficient light-emitting diode (LED) technology. Further mitigation measures will be put in place during detailed design in line with the TII Sustainability Implementation Plan (TII, 2021).

The proposed Project has been designed to reduce the impact on climate as a result of modal shift from private vehicles to public transport. The transfer of a proportion of these single occupancy car trips onto public transport would not only reduce carbon emissions, but also reduce congestion along this corridor The P&R will also provide secure bike parking to facilitate use of active transport options for the initial stage of the journey.

By creating a more accessible public and active transport network, the proposed infrastructural works will provide an attractive alternative to private car travel, encouraging more passenger travel by more sustainable modes while providing a better quality of life for citizens. Total trip demand is increasing into the future in line with population, employment and growth of jobs.

7.0 RESIDUAL EFFECTS OF THE PROPOSED PROJECT

The TII guidance states that the following two factors should be considered when determining significance:

- The extent to which the trajectory of GHG emissions from the project aligns with Ireland's GHG trajectory to net zero by 2050; and
- The level of mitigation taking place.

The level of mitigation described in Section 6.0 has been taken into account when determining the significance of the proposed development's GHG emissions. The proposed development will result in some impacts to climate through the release of GHGs. TII state that the crux of assessing significance is "*not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050*".

The proposed development has proposed some best practice mitigation measures and is committing to reducing climate impacts including alignment with CAP24, where feasible.

It should be noted that operational phase emission changes are only associated with the roads in close proximity to the Park and Ride facility and therefore do not indicate the full extent of the potential benefits of the proposed Park and Ride facility. The modal shift to from private vehicles to public transport at the P&R is likely to have a beneficial impact if emissions across a wider area are considered and therefore the likely operational effect is beneficial. The promotion of Park and Ride facilities aligns with CAP24 which aligns with the SHIFT element of the 'Avoid-Shift-Improve' transport framework. The Park and Ride facility aims to shift people from completing full journey in private vehicles to only using their private vehicles for part journeys or facilitating use of active travel due to bike storage.

The Fully in line to achieve Ireland's trajectory towards net zero.

As per the assessment criteria in Table 4 the impact of the proposed development in relation to GHG emissions is considered direct, ***long-term, negative*** and ***slight,*** which is overall ***not significant*** in EIA terms.

In relation to climate change vulnerability, it has been assessed that there are no significant risks to the proposed development as a result of climate change. The residual effect of climate change on the proposed development is considered ***direct, long-term, negative*** and ***imperceptible***, which is overall ***not significant*** in EIA terms

8.0 CUMULATIVE IMPACTS

With respect to the requirement for a cumulative assessment PE-ENV-01104 (TII, 2022a) states that *"the identified receptor for GHG Assessment is the global climate and impacts on the receptor from a project are not geographically constrained, the normal approach for cumulative assessment in EIA is not considered applicable. By presenting the GHG impact of a project in the context of its alignment to Ireland's trajectory of net zero and any sectoral carbon budgets, this assessment will demonstrate the potential for the project to affect Ireland's ability to meet its national carbon reduction target. Therefore, the assessment approach is considered to be inherently cumulative".*

As per the above, the cumulative impact of the proposed development in relation to GHG emissions is considered **direct, long-term, negative** and **slight**, which is overall **not significant** in EIA terms.

9.0 REFERENCES

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Transport Infrastructure Ireland (TII) (2022a) PE-ENV-01104: Climate Guidance for National Rods, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document

Transport Infrastructure Ireland (TII) (2022b) GE-ENV-01106: TII Carbon Assessment Tool for Road and Light Rail Projects and User Guidance Document

Transport Infrastructure Ireland (TII) (2022c) TII Roads Emissions Model (REM) Online Tool

APPENDIX F

Traffic and Transportation Assessment

Clifton Scannell Emerson Associates

Traffic and Transport Assessment

Ashford Park & Ride

Client: National Transport Authority

Date: 28/07/2023

Job Number: 20_008L

Civil Engineering | Structural Engineering | Transport Engineering | Environmental Engineering | Project Management | Health and Safety

CONSULTING ENGINEERS

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Document Control Sheet

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Project Number:	20_008L
Report Title:	Traffic and Transport Assessment
Filename:	RPT-20_008L-001

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1st	FINAL	28/07/2023	JS	GE

Table of Contents

Executive Summary

CSEA has been appointed by the National Transport Authority's (NTA) Park and Ride Development Office (PRDO) to prepare a Traffic and Transport Assessment for the development of a high-quality Park and Ride facility in the west of Junction 16, located 1.3 km east of Ashford town on the M11/N11 radial corridor and 52 km south of Dublin. The site is reasonably close (circa 75 m west of the interchange) to the motorway and is easily accessible from the N11 via Junction-16 and R772 West Arm. It is proposed to convert the existing site access located on R772 into a standard all-movement priority junction for the Park & Ride facility.

The proposed Park and Ride facility site covers a total area of 23,000 sq. meters. The development of the proposed Park and Ride facility complies with the policy set down in Wicklow County Development Plan 2022-2028. The number of car parking proposed on the site is based on the demand analysis, using East Regional Model (ERM), conducted along M11 near south of Junction 16 by Park and Ride Development Office (PRDO). An overview of the proposed parking is presented in the table below.

Car Parking	210 no. spaces, including 13 no. disabled spaces and 21 no. electric charging spaces
Cycle Parking	20 no. bicycle parking Sheffield stands, 20 no. bike lockers

Table 1 *Summary of Parking Provision*

It will consist of a new car parking area with 210 car parking spaces, set-down areas, and taxi ranks with dedicated access. A new bus standing area is proposed with a dedicated turning circle, 2 new bus bays and 2 passenger shelters. 20 no. bicycle parking Sheffield stands, and 20 no. bike lockers will also be provided within the site to cater for cyclists accessing the facility.

It is anticipated that the proposed development will become operational by 2025.

The estimated daily usage of the proposed Park and Ride facility is 204 no. car trips in the year of opening 2025 (based on the demand analysis using ERM conducted by PRDO). The peak hours in the vicinity of the site are determined to be 08:15-09:15 AM and 16:15-17:15 PM, and the overall trips are likely to be concentrated around the peak hours due to the nature of the development's operations. The bus services will include rerouting of the existing services in the nearby area to cater for the Park and Ride facility.

Classified Junction Turning Counts were carried out at the priority double roundabout interchange- Junction 16 along M11 on Thursday 29th September 2022 between 07:00 to 19:00. The survey was undertaken by IDASO on behalf of CSEA. In this study, for traffic modelling purpose, different labels are assigned to different junctions on which the traffic impact assessment is performed. The western roundabout at the intersection of N11, R772 ramp and R772 West Arm is referred to as J16-A and the eastern roundabout at the intersection of N11, R772 ramp and R772 East Arm is referred to as J16-B.

2025 Opening- Year	Junction will operate within capacity and at the best level of Service (A). J16-A: 5.97 seconds delay in AM Peak; 5.32 seconds delay in PM Peak. J16-B: 6.11 seconds delay in AM Peak; 5.90 seconds delay in PM Peak
2030 Future-Year	Junction will operate within capacity and at the best level of Service (A). J16-A: 5.96 seconds delay in AM Peak; 5.34 seconds delay in PM Peak. J16-B: 6.11 seconds delay in AM Peak; 5.92 seconds delay in PM Peak
2040 Future-Year	Junction will operate within capacity and at the best level of Service (A). J16-A: 5.94 seconds delay in AM Peak; 5.39 seconds delay in PM Peak. J16-B: 6.11 seconds delay in AM Peak; 5.96 seconds delay in PM Peak

Table 2 *Summary of Junction 16 Analysis with Proposed Development*

The modelling results obtained shows that the junction will operate at a Level of Service A, with or without this proposed development.

While the performance of the junction does become slightly lower, as would be expected with the opening of the proposed development, it should be noted that the impact of the development is minor and that the reduced performance of the junction is for the most part due to background traffic growth.

On that basis, the traffic impact of the operational phase of the proposed development can be described as ***long-term***, ***neutral*** and ***imperceptible***. During construction stage the impact of the proposed development is expected to be ***short-term***, ***negative*** and ***not significant***.

1 Introduction

1.1 Overview

CSEA has been appointed by the National Transport Authority's (NTA) Park and Ride Development Office (PRDO) to prepare a Traffic and Transport Assessment for the development of a high-quality Park and Ride facility in the west of Junction 16, located 1.3 km east of Ashford town on the M11/N11 radial corridor and 52 km south of Dublin. The site is reasonably close (circa 75 m west of the interchange) to the motorway and is easily accessible from the N11 via Junction-16 and R772 West Lane. It is proposed to convert the existing site access located on R772 into a standard all-movement priority junction for the Park & Ride facility.

The proposed Park and Ride facility site covers a total area of 23,000 sq. meters. It will consist of a new car parking area with 210 car parking spaces, set-down areas, and taxi ranks with dedicated access. A new bus standing area is proposed with a dedicated turning circle, 2 new bus bays and 2 passenger shelters. 20 no. bicycle parking Sheffield stands, and 20 no. bike lockers will also be provided within the site to cater for cyclists accessing the facility.

It is anticipated that the proposed development will become operational by 2025.

1.2 *Need for Transport Assessment*

Table 1.4 of the Traffic Management Guidelines (DoT/ DoEHLG/ DTO, 2003) and Table 2.1 of TII's Traffic and Transport Assessment Guidelines (PE-PDV-02045), May 2014 sets out thresholds above which a Transport Assessment is automatically required (duplicated in Figure 1-1, below).

Table 2.1 Traffic Management Guidelines Thresholds For Transport Assessments

Traffic to and from the development exceeds 10% of the traffic flow on the adjoining road.
Traffic to and from the development exceeds 5% of the traffic flow on the adjoining road where congestion exists or the location is sensitive.*
Residential development in excess of 200 dwellings.
Retail and leisure development in excess of 1,000m$^{2.}$
Office, education and hospital development in excess of 2,500m^2.
Industrial development in excess of 5,000m^2.
Distribution and warehousing in excess of 10,000m^2.

* In locations that experience particularly heavy congestion and when traffic flows from a proposed development are less than 5% of the traffic flows on the adjoining road, a Transport Assessment may still be required. When in doubt, the requirement for a Transport Assessment should always be scoped with the relevant local authority.

Figure 1-1 *Threshold for Transport Assessments*

The traffic to and from the development is expected to be more than 10% of the traffic flow on the adjoining road, therefore a Traffic and Transport Assessment has been undertaken to assess the impacts associated with the proposal. More details on trip generation from the proposed Park and Ride facility can be found in **Section 5.3**.

2 Methodology

This report has been prepared taking the following documents into account:

- Project Ireland 2040 – National Planning Framework;
- Wicklow County Development Plan 2022-2028;
- TII Traffic and Transport Assessment Guidelines, 2014;
- TII Geometric Design of Junctions DN-GEO-03060, June 2017;
- TII Project Appraisal Guidelines for National Roads Unit 5.3 - Travel Demand Projections
- Greater Dublin Area Transport Strategy 2022-2042
- Proposed Residential Development at Rossana Lower, Rathnew, TTA, AECOM, October 2021;
- Ashford Lands, Housing Development, Wicklow, TTA, PUNCH consulting, February 2021.

The methodology used to conduct the assessment is as follows:

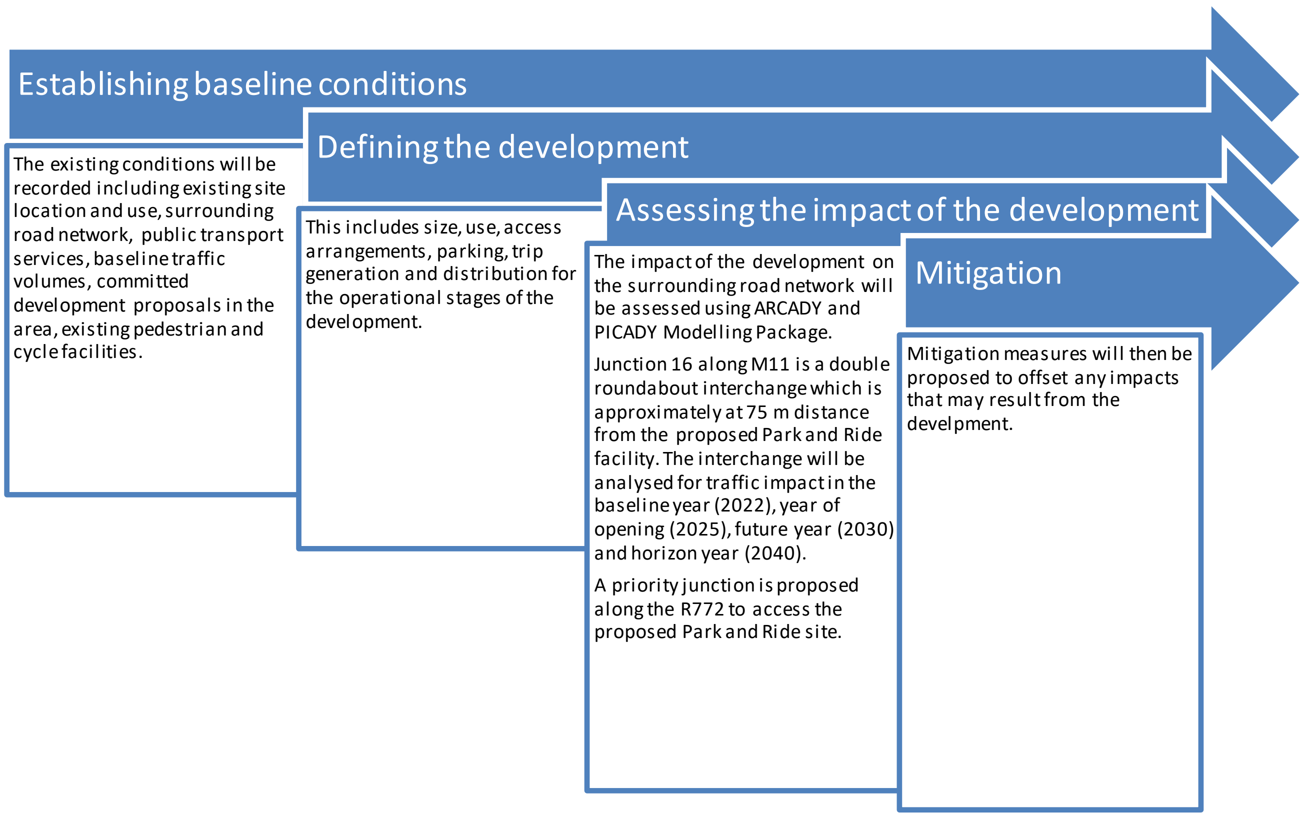


Figure 2-1 Methodology

3 Relevant Policy

3.1 *Project Ireland 2040 – National Planning Framework*

The development of the proposed Park and Ride facility complies with the following policy set down in the Project Ireland 2040 – National Planning Framework.

National Strategic Outcome 4: Sustainable Mobility - Public Transport: Expand attractive public transport alternatives to car transport to reduce congestion and emissions and enable the transport sector to cater for the demands associated with longer term population and employment growth in a sustainable manner.

Deliver the key public transport objectives of the Transport Strategy for the Greater Dublin Area 2016-2035 by investing in projects such as New Metro Link, DART Expansion Programme, BusConnects in Dublin and key bus-based projects in the other cities and towns.

3.2 *Wicklow County Development Plan (2022-2028)*

The development of the proposed Park & Ride facility complies with the following policy set down in Wicklow County Development Plan 2022-2028:

CPO 11.29: To support tourist/visitor park and ride facilities at appropriate locations that will facilitate access to upland amenity areas as may be identified in the Glendalough and Wicklow Mountains National Park Masterplan, or by strategies / plans of the Wicklow Outdoor Recreation Committee, Wicklow Tourism or other tourism agencies.

Sustainable Transportation-12.2.2 Park & Ride Facilities

The purpose of a 'Park and Ride' facility is to encourage car commuters to drive or cycle to a specific location with a car and secure bicycle park close to a high quality public transport service and to transfer to public transport, thereby reducing congestion and promoting public transport. Park and Ride sites often use valuable land adjacent to high-capacity public transport stations/stops which might be better used to provide intensive development, and therefore careful consideration will be given to ensure optimal locations, at the edge of or just outside town centres, that are attractive to users and developed for such use. The NTA has established a dedicated Park and Ride design office. Wicklow County Council is working with the NTA to determine locations for park and ride facilities along primary routes such as the M11/N11.

CPO 12.1: Through coordinated land-use and transport planning, to reduce the demand for vehicular travel and journey lengths by facilitating initiatives like carpooling and park and ride.

CPO 12.21: To promote the development of transport interchanges and 'nodes' where a number of transport types can interchange with ease. In particular: to facilitate the development of park and ride facilities at appropriate locations along strategic transport corridors which will be identified through the carrying out of required coordinated, plan-led transport studies and consultation with the appropriate transport agencies and/or Regional Authority.

CPO 16.28: To encourage carpooling and facilitate park and ride facilities for public transport.

3.3 Greater Dublin Area Transport Strategy (2022-2042)

Section 9.5.1 of Greater Dublin Area Transport Strategy (2022-2042), published by NTA, describes the overall proposed Park and Ride strategy for the Greater Dublin Area. As per the strategy: *A Park & Ride Development Office was established within the NTA in February 2020 as recommended in the Climate Action Plan 2019. Through this office a set of recommendations for the development of park and ride facilities have been developed. Those recommendations have been incorporated into the Transport Strategy and the locations selected for potential development are shown in Figure 9.1* (**Figure 3-1** in this report).

GDA transport strategy states that: *Appropriately located and designed Park & Ride facilities can enable these people to access public transport and enhance their options to reach a wide range of destinations in a sustainable manner and increase the usage of public transport, thereby maximising the value of investment in existing and new schemes.*

As per *Measure INT4-Park & Ride: It is the intention of the NTA to secure the development of a network of regional level bus and rail based Park and Ride facilities in the GDA at appropriate locations where the national road network meets, or is in close proximity to, high capacity bus and rail services.*

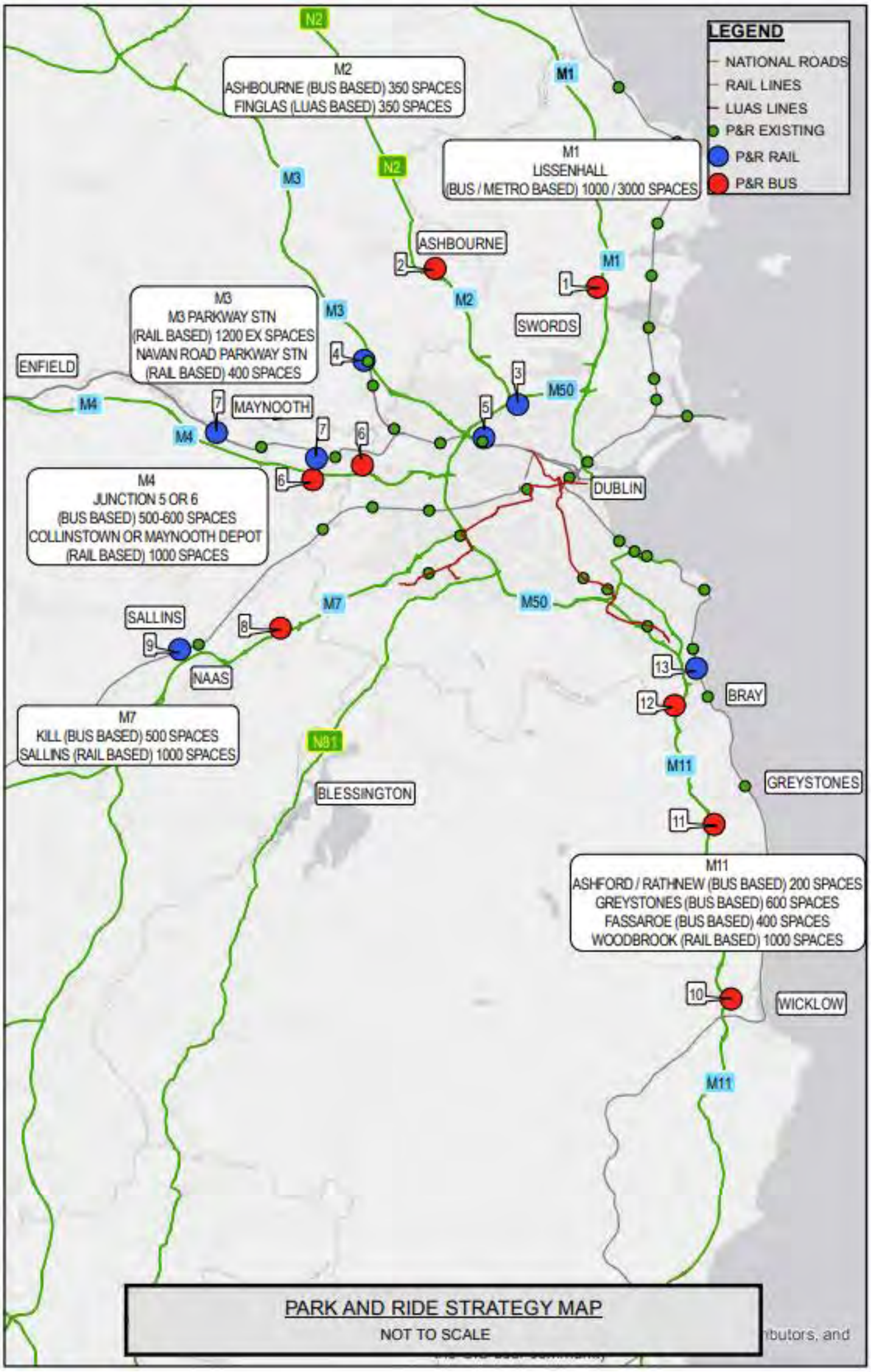


Figure 3-1: *Park and Ride Strategy Map- GDA Transport Strategy*

4 Existing Conditions

4.1 Existing Site Location and Use

The proposed Park and Ride site is located to the west of Junction 16-M11, approximately 1.3 km east of Ashford town and 180 meters from M11 motorway. The Park and Ride site is currently a privately owned land with an area of 2.3 hectares. This land is currently not zoned in the Wicklow County Council Development Plan (2022-2028).

The proposed Park and Ride site is a part of the 13 strategic locations selected for the provision of new Park and Ride facilities in the Greater Dublin Area. The proposed site will provide a new car parking area along with set down area for taxis, bike shelters and bus standing area. The objective of the proposal is to facilitate good public transport connectivity from the site to Dublin City Centre and vice versa, by allowing people to access the site via different modes of transport and taking the bus service. This is discussed in further detail in **Section 5**.

The site is well connected with the existing road network and can be accessed via Junction 16- M11 followed R772 beside the proposed Park and Ride. Junction 16 is a priority double roundabout interchange connecting M11 with R772 and access roads to residential areas. **Figure 4-1** below, illustrates the site location in relation to the surrounding road network.

Figure 4-1 *Site Location*

4.2 Existing Road network

The proposed Park and Ride site is well connected to the existing road network via the following road links:

- R772 West- a single carriageway road beside the proposed Park and Ride site
- M11 via Junction 16- M11/N11 radial corridor connects Dublin City to Rosslare Port and is of strategic importance nationally;
- R772 East via Junction 16; a regional road that connects M11 to Rathnew and Ashford

4.3 Existing Public Transport Services

Buses are the most convenient mode of public transport servicing the site. Currently, bus priority is provided in both directions on the N11 between Loughlinstown and the N11's northern extent at Mount Merrion Avenue, where it continues onto the R138. Bus priority is also provided in both directions along the R138 between this point and Dublin's City Centre. Bus Éireann 2/X2, 133, 133x, and Wexford Bus 740 and 740A currently pass Junction-16 throughout the day connecting the hinterland (Wicklow, Wexford) and Dublin City through the Dublin suburban area. Currently, these buses do not have a stop in the area close to the proposed site.

4.4 Existing Traffic Volumes

4.4.1 2022 Traffic Survey

Classified Junction Turning Counts were carried out at the priority double roundabout interchange-Junction 16 along M11 on Thursday 29th September 2022 between 07:00 to 19:00. The survey was undertaken by IDASO on behalf of CSEA. **Figure 4-2** below illustrates the location of the survey in relation to the proposed development site. In this study, for traffic modelling purpose, different labels are assigned to different junctions on which the traffic impact assessment is performed. The western roundabout at the intersection of M11, R772 West and R772 ramp is referred to as J16-A and the eastern roundabout at the intersection of R772 ramp, M11 and R772 East is referred to as J16-B.

Junction 2 will be utilized as an entrance to the proposed Park and Ride site, and is proposed to be built with the Park and Ride development. Traffic flow through Junction 2 is estimated using the proposed Park and Ride facility's trip generation data. More details on Junction 2 can be found in **Section 5.4**.

Figure 4-2 *Survey Location*

Following the analysis of the survey results for the junctions mentioned above (J16-A and J16-B), it was determined that the network AM peak hour occurs between 08:15-09:15hrs and, while the network PM peak hour occurs between 16:15-17:15 hrs. The survey results for these junctions are summarised within **Table 4-1** and **Table 4-2** below. Traffic flow through Junction 2 is determined in **Section 7.6**25 using the trip generation data for the proposed Park and Ride facility. Traffic figures presented in the below are in Passenger Car Units (PCUs) with the following factors assumed: *medium goods vehicles 1.5, bus 2.0, and HGV 2.3. Source: TII, Project Appraisal Guidelines for National Roads Unit 5.2 (October 2016).*

Junction Arm	Approach flows J16-A PCUs	
	AM Peak (08:15-09:15)	PM Peak (16:15-17:15)
M11- North	0	0
R772	837	774
M11- South	155	90
R772 West	392	388
Total Flows	1,384	1,252

Table 4-1 *Traffic Survey Results 2022 Survey- J16-A*

Junction Arm	Approach flows J16-B PCUs	
	AM Peak (08:15-09:15)	PM Peak (16:15-17:15)
M11-North	474	679
R772 East	851	777
M11-South	0	0
R772	364	359
Total Flows	1,689	1,815

Table 4-2: *Traffic Survey Results 2022 Survey- J16-B*

Figure 4-3 and **4.4** below, illustrate the turning proportions at each arm for Junction 16-A and 16-B respectively.

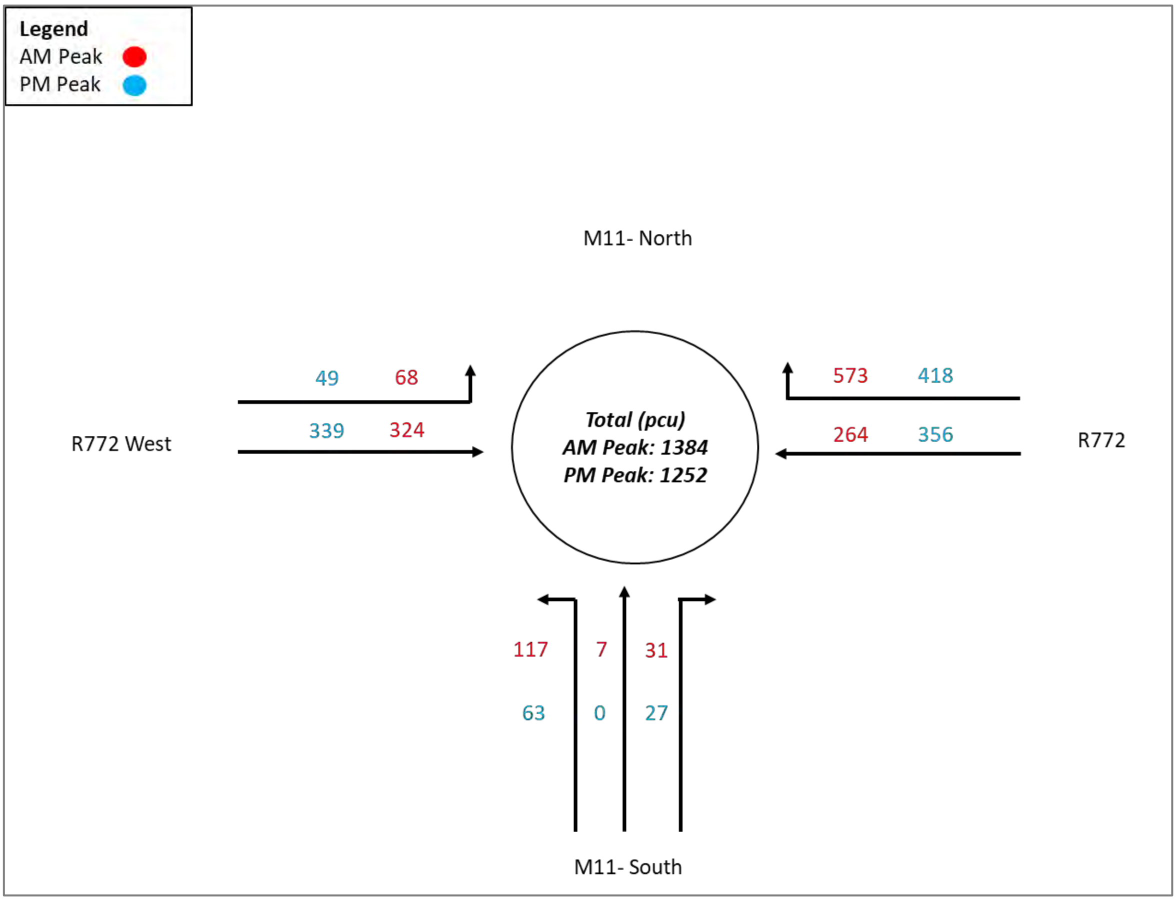


Figure 4-3 *Traffic Survey Turning Proportions at Junction 16-A 2022 Survey*

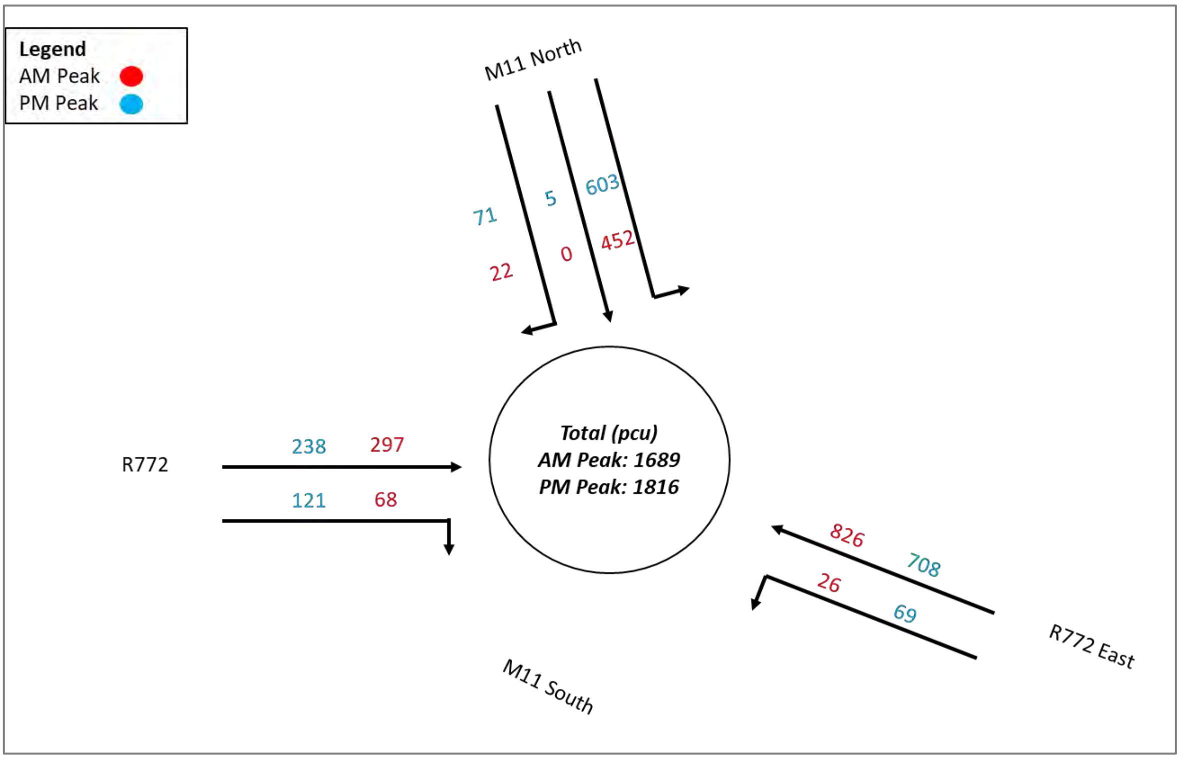


Figure 4-4*: Traffic Survey Turning Proportions at Junction 16-B 2022 Survey*

4.5 *Committed Developments in the Vicinity of the Site*

4.5.1 Residential Development at Rossana Lower

Karla Clarke is proposing a residential development on a site located off the R761 in Rathnew, Co. Wicklow. The planning application submitted relating to this development has an associated planning reference of *211195*.

The proposed development will include 90 No. residential units (64 No. houses and 26 No. duplexes) and a childcare facility of 196 sq.m together with all associated site development works including estate roads, footpaths, car parking, bins & bicycle storage, boundary treatment, services infrastructure including watermains, foul sewerage, surface water sewerage and on-site attenuation tanks at Rossana Lower, Rathnew, Co. Wicklow.

The site is located close to Junction 16 along N11/M11. The proposed development includes for measures to upgrade and realign the Newcastle Road (R761) which will provide for turning lanes at the entrance to the proposed development and Clermont College and new pedestrian crossing. The year of opening of this development is expected to be 2024.

4.5.2 Ashford Lands, Housing Development

A Strategic Housing Development is proposed within Ashford, Co. Wicklow. The proposed development is bounded by existing residential buildings to the west and by greenfield sites to the north, east and south. The planning application submitted relating to this development has an associated planning reference of *SH202101.*

The Strategic Housing Development (SHD) will consist of 117 no. dwellings comprising 99 no. 2-4 bed houses (1- 2 storey) and a 3-storey block of 18 no., 2 & 3 bed duplex apartments. Provision of a creche, bin and bicycle storage, parking, open spaces, pump station and connection to the public road and footpath network via the adjoining Rossana Close / Woodview / Aishleigh estate road. All associated site development, landscaping, boundary treatments, and services connections. It is proposed to access the proposed development via the existing residential development Roassana Close. The year of opening of the proposed SHD is assumed to be 2023.

4.6 *Existing pedestrian and cyclist facilities*

4.6.1 Pedestrian facilities

The proposed Park and Ride site will be accessed via R772 West arm of Junction 16-A and an existing access at the entrance of the site which is proposed to be developed into an all-movement priority junction. R772 West arm is a single carriageway regional road with existing footpath on either side of this road on the southern side between Ashford town and J16-A. The M11 South and North ramp of J16-A lacks adequate pedestrian facilities. R772 ramp of J16-A has continuous pedestrian facility along either side of the road. R772 East arm of J16-B has a segregated footpath on one side of the road. The M11 North and South arms of J16-B lack adequate pedestrian facilities.

4.6.2 Cyclist facilities

The proposed Park and Ride site will be accessed via R772 West arm of Junction 16-A and an existing access at the entrance of the site which is proposed to be developed into an all-movement priority junction. Currently there are no cycle facilities along the arms of J16-A and J16-B.

As a part of the proposal, new active travel connections (pedestrian and cycle) with a crossing facility have been proposed on R772 West arm linking the existing infrastructure to the Park & Ride as part of the junction improvement. This has been discussed in detail in **Section 5.2** of this report.

5 Proposed Development

5.1 General Description and Use

The proposed development comprises of a park and ride facility located to the west of Junction 16 on N11, 1.3 km east of Ashford town. The site is reasonably close (circa 180 m) to the motorway and is easily accessible from the N11 via Junction-16 and the existing single carriageway regional road R772 (west arm).

The proposed site is a part of the 13 strategic park and ride facilities to be provided by NTA Park and Ride Development Office in the Greater Dublin Area. The overall objectives of the proposed Park and Ride development are:

- To maximise the opportunities provided by on-going investment in public transport infrastructure and services, particularly in relation to the commencement of service of new public transport projects.
- To provide the appropriate type and scale of Park and Ride at the right locations, with connectivity to the road and public transport networks and design that supports integration with the surrounding walking and cycling network.
- Reduce reliance on the private car, reduce distances travelled by car and ensure Park and Ride facilitates greater use of sustainable modes.
- Deliver an enhanced customer experience through safe, secure, and user-friendly facilities that consider opportunities for interchange and to address barriers to public transport use.

As a strategic Park & Ride, this facility aims to intercept motorway car traffic that originates in catchment areas further south of Junction 16 location and transfer them to a bus suitable for their destination at the facility.

The proposed Park and Ride facility will consist of a new parking area with a total of 210 car parking spaces, including 13 no. mobility impaired parking spaces (including 1 EV MID spaces) and 21 no. e-car charging spaces. Along with this, a new bus standing area, set down areas, taxi ranks, and bike shelters and lockers will be provided. More details on the breakdown of parking in the proposed area can be found in **Section 6** of this report.

The development includes the provision of access arrangements to serve the site, landscaping, boundary treatments, lighting, services, and all associated and ancillary works.

5.2 Access Arrangements

5.2.1 Vehicular Access

Vehicular access to the proposed Park and Ride development will be majorly via Junction 16 followed by R772 West arm. It is proposed to convert the existing site access located on R772 into a standard all-movement priority junction for the Park & Ride facility.

Bus servicing the nearby areas will be rerouted to serve the proposed Park & Ride facility. These bus services will be provided for the people from the Park and Ride site to Dublin city centre and vice versa. The proposed site consists of a wide bus loop with bus bays and shelters on the side. The proposed site also has dedicated set down areas and taxi ranks. The proposed site will provide an internal network of roads to facilitate smooth and safe movement of cars, buses, taxis, cyclists, and pedestrians. The parking area can be accessed at the northern end of the proposed site from the new internal access road. A separate egress point will be located at the southwest edge of the car park, circa 45m north of the new main access junction (J2). **Figure 5-1** below illustrates the plan of the proposed site with major facilities and access points.

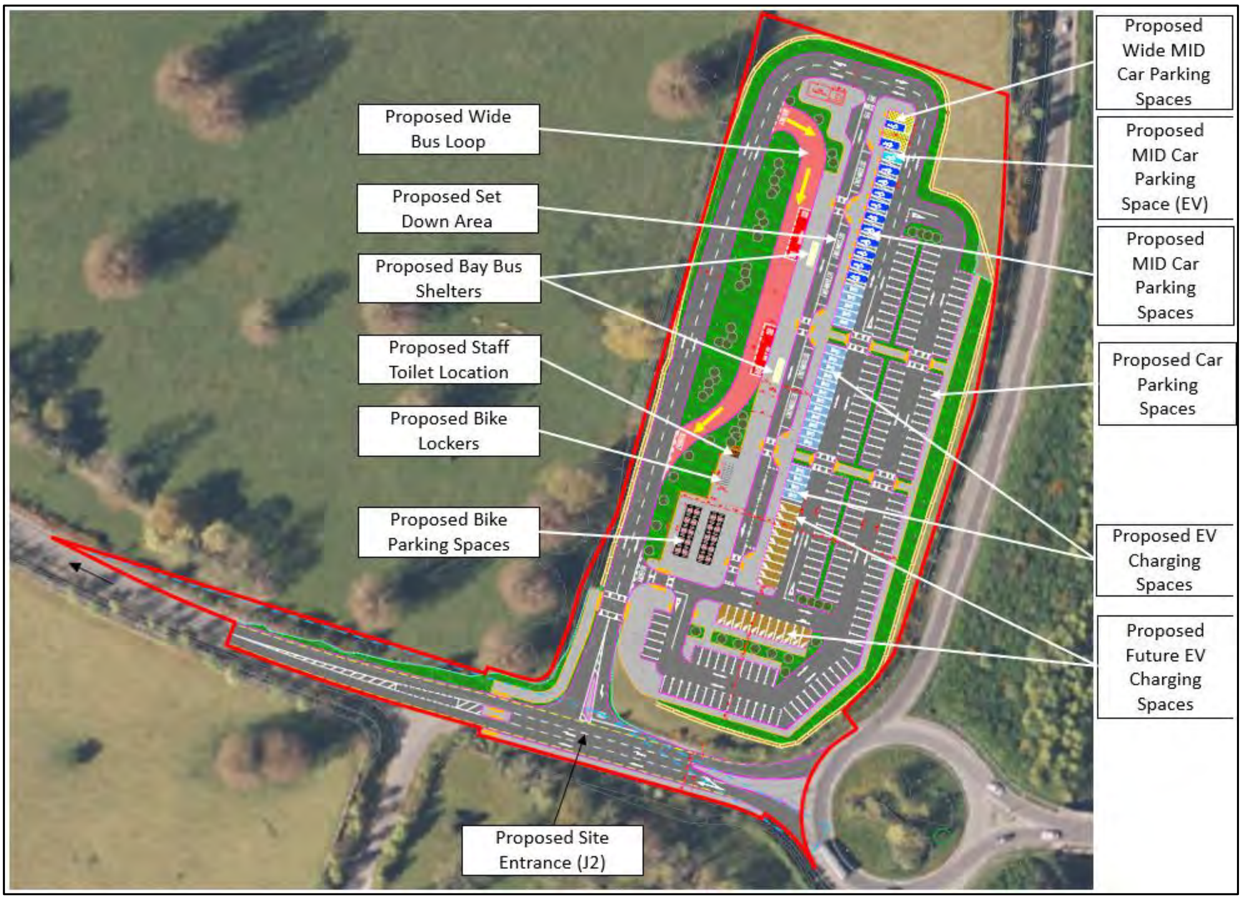


Figure 5-1 *Proposed Site Plan*

5.2.2 Pedestrian/ Cyclists Access

Existing pedestrian facilities are present along the southern part of R772 West arm. As a part of the scheme, new realigned and standardised footway has been proposed that will link to the existing facilities.

New active travel connections (pedestrian and cycle) with a new uncontrolled crossing facility have been proposed on R772 West linking the existing infrastructure to the Park & Ride as part of the J2 junction improvement.

Inside the proposed Park and Ride site, well connected and standardised shared footpaths and cycle paths are proposed with minimum width of 2 meters to safely access the services within the facility such as car parking, bus services etc. 20 no. bicycle parking Sheffield stands, and 20 no. bike lockers will also be provided within the site to facilitate cyclists wishing to avail this facility. **Figure 5-2** below illustrates the provision for pedestrians/cyclists inside the sites.

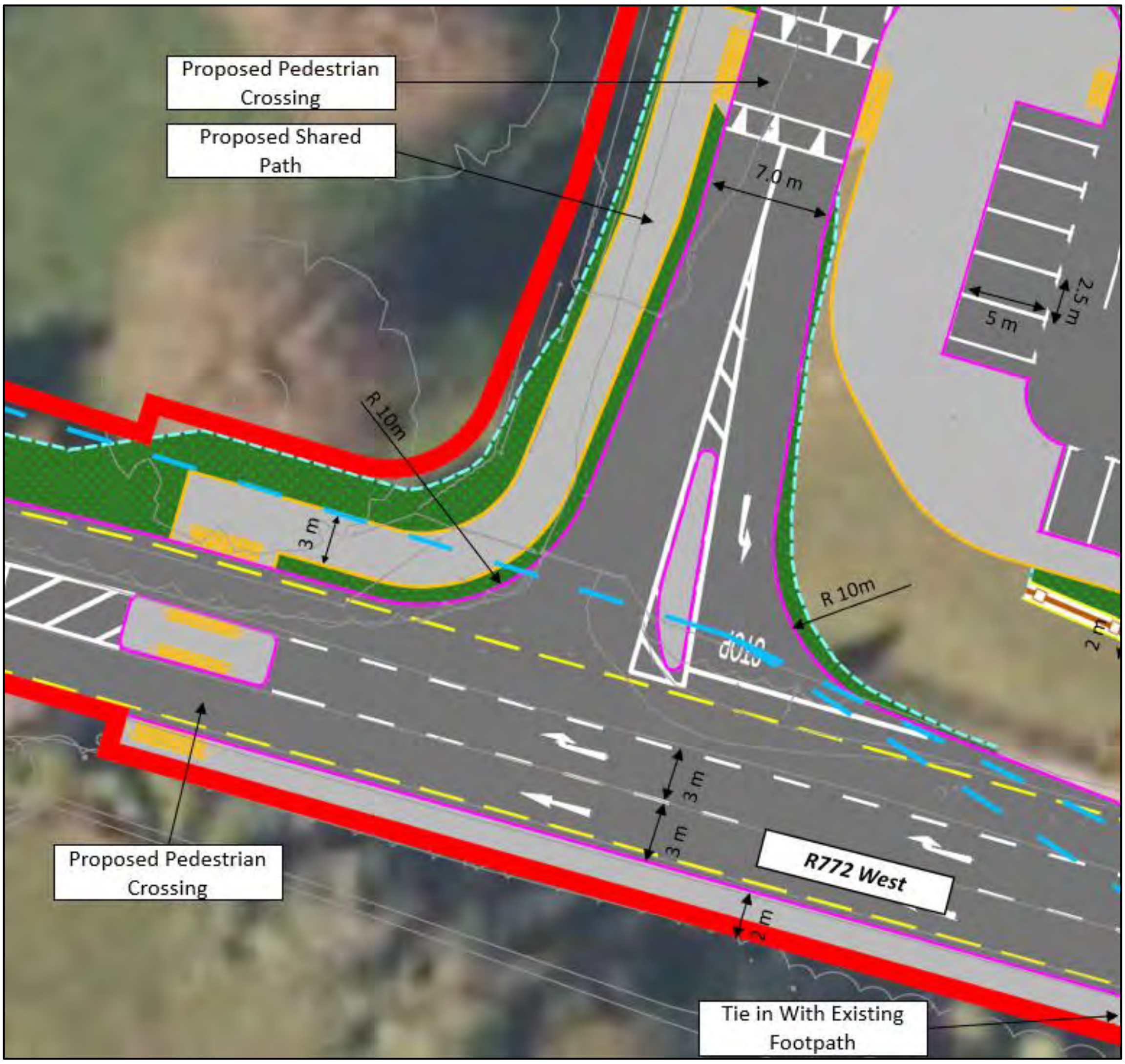


Figure 5-2 *Pedestrian/ Cyclist Access to the Proposed Site*

5.3 Trip Generation

Vehicular trip rates were estimated for the proposed Park and Ride site using the data provided by Park and Ride Development Office (PRDO). Demand analysis using East Regional Model was performed by PRDO along N11, south of Junction 16 to estimate the number of trips attracted by the proposed Park and Ride facility for different years. Over the demand, it is assumed that there would be an additional 20% of the number of car trips for drop-offs/pick-ups to/from the Park and Ride site. There are four existing bus service that could potentially be rerouted to cater for Park and Ride bus services from this location to Dublin city centre and vice versa. While it is anticipated only one of these services would stop at the site, resulting in an approximately 60 minute service to the site. However, taking a highly conservative approach, a ten minute service has been assumed during peak hours for modelling purposes.

The number of arriving and departing trips expected during the peak hours of the day in the year of opening (YoO 2025), YoO+5 and YoO+15 is shown in **Table 5-1**.

Trip Generation								
Year of Assessment	AM Peak 08:15-09:15				PM 16:15-17:15			
	Incoming		Outgoing		Incoming		Outgoing	
	Trips	% HV	Trips	% HV	Trips	% HV	Trips	% HV
YoO 2025	42	17%	13	54%	12	42%	48	10%
YoO+5 (2030)	57	12%	15	47%	15	33%	63	8%
YoO+15 (2040)	87	8%	20	35%	25	20%	92	5%

Table 5-1: *Proposed Development Estimated Trip Generation-Vehicles*

5.4 Proposed Junction- Junction 2

It is proposed to convert the existing site access located on R772 West arm of J16-A into a standard all-movement priority junction for the Park & Ride facility. The junction will be operational with the proposed Park and Ride Site in 2025. **Figure 5-3:** Proposed layout of Junction 2**Figure 5-3** presents the proposed layout of the junction.

Figure 5-3: *Proposed layout of Junction 2*

A new 50m long and 3m wide right-turning lane will be built on R772 as part of the proposed junction by realigning the existing eastbound lane towards north to facilitate the local widening. The new junction will be constructed in line with the requirements of Section 5.6.4 of the Geometric Design of Junctions published by Transport Infrastructure Ireland (Ref. No. DN-GEO-03060). New height restriction barriers with a 2.7-metre-high clearance will be installed at the northern entrances of the car parking area.

6 Parking

Wicklow County Council Plan 2022-2028 states that *"The purpose of a 'Park and Ride' facility is to encourage car commuters to drive or cycle to a specific location with a car and secure bicycle park close to a high-quality public transport service and to transfer to public transport, thereby reducing congestion and promoting public transport."* The development plan also focuses on transition to EV by prioritising EV parking and effectively managing parking to make public transport, walking, and cycling more attractive option. One of the objectives (CPO 12.58) of the development plan is- "*Provision shall be made in all new / expanded developments for Age Friendly and Disabled parking (and associated facilities such as signage, dished kerbs etc), at a suitable and convenient location for users.*"

6.1 Car Parking Provision

The proposed Park and Ride facility site covers a total area of 23,000 sq. meters approximately. It will consist of a new car parking area with 210 car parking spaces and set-down areas and taxi ranks with dedicated access. The proposed scheme shall provide 21 no. parking and charging points for Electric Vehicles (excluding EV MID spaces). This represents 10% of the total parking capacity of the facility which is in line with the recommendation set out in the *Wicklow County Development Plan 2022-2028*. In addition, 21 no. standard parking spaces (~10%) will be futureproofed with ducting etc. to facilitate easy conversion to EV parking in the future.

The proposed scheme shall provide 13 no. parking spaces for mobility-impaired users which represents more than ~5% of the total parking capacity of the facility. One (1 no.) of these spaces will be equipped with electric vehicle charging capability and 2 are large spaces (7.8m x 5.4 m). All standard parking bays within the proposed development will have dimensions of 2.5m x 5.0m. The parking area can be accessed at the northern end of the proposed site from the new internal access road. A separate egress point will be located at the southwest edge of the car park, circa 45m north of the new main access junction.

It is unlikely that the Park and Ride facility would be fully occupied (there may be some unoccupied disabled and electric vehicle charging spaces, and typically a proportion of spaces within a car park are made redundant due to drivers in adjacent spaces parking incorrectly). Given the nature of the proposed development, most of the trips to and from Park and Ride facility will be made during the AM and PM peak hours.

From the demand analysis conducted by PRDO using ERM, for the year of opening (2025) it is estimated that the estimated daily usage of the proposed Park and Ride facility is expected to be 204 spaces.

6.2 Cycle parking provision

New active travel connections (pedestrian and cycle) with a new uncontrolled crossing facility have been proposed on R772 linking the existing infrastructure to the Park and Ride as part of the junction improvement.

20 no. bicycle parking Sheffield stands, 20 no. bike lockers will also be provided within the site to facilitate cyclists wishing to avail this facility.

6.3 Public Transport

The proposed Park and Ride site consists of a new bus standing area with a dedicated turning circle, two new bus bays and two passenger shelters. The proposed bus turning circle will be 7 metres wide and 60 metres long, sufficient in length to safely accommodate 2 coaches. A bus service plan will also be proposed to provide bus services from this location to Dublin city centre and vice versa. The bus services will include rerouting of existing services in the nearby area to cater for the Park and Ride facility. These services might include Dublin buses- 133, 133X, Bus Éireann 2, X2 and Wexford buses740 and 740A. The frequency of the different bus services during the peak period would be 1 in 60 minutes approximately in each direction. It is assumed that the frequency of service stopping at the Park and Ride site would be in the order of one service every 60 minutes. However, in the highly unlikely event that all existing bus services would stop at the site and taking a highly conservative approach, a 10 minute bus service frequency has been assumed for modelling purposes.

7 Traffic Growth Forecasting

7.1 Introduction

This section of the TTA Report sets out the approach pursued in estimating the baseline traffic growth in the road network in the vicinity of the site. The contents within this section present the estimated traffic volumes at the relevant junction in future years without and with the development in place. Furthermore, this chapter also presents the estimated development traffic distribution throughout the network.

7.2 Baseline Traffic Growth Forecasting

In order to understand the impact of the development proposals on the local road network, it is first necessary to understand the without development or 'do-nothing' scenario for the base year (2022), the year of opening (YoO, 2025), future year (YoO+5, 2030), and horizon year (YoO+15, 2040). Traffic levels in the do-nothing scenario comprises of base year's background traffic flows and traffic flow from the committed developments.

Existing traffic flows on the surrounding road network was determined via surveys discussed in **Section 4.4**. For this assessment, the existing traffic was not grown utilising the growth factors from Transport Infrastructure Ireland (TII) *Project Appraisal Guidelines for National Roads.* This is because the vehicular traffic is expected to decrease in the future considering different policies that are being followed in regards with shift towards more sustainable modes of transport. Moreover, PRDO considered a growth in vehicular traffic expected to utilise the Park and Ride site in different future years in the demand analysis. Apart from this, growth of committed developments in the future years is also included in the traffic flowing through Junction 16. Therefore, the baseline traffic is assumed to be the same in all assessment years. **Table 4-1** and **Table 4-2** presents the baseline traffic flows across Junction 16A and 16B.

7.3 Committed Developments

As discussed in section 4.5, a residential development is proposed at Rossana Lower in Rathnew, and a Strategic Housing Development is proposed in Ashford. The residential development is expected to become operational in 2024, and the SHD in 2023.

Both these developments include residential units with works on the estate roads, parking facilities for cars and bicycles, footpaths and childcare facilities.

The sites are located close the N11/ M11 with access achievable via Junction 16 interchange.

The traffic flow from the developments were estimated by the property development's relevant team using TRICS for different hours of the day. For this TTA, same data has been used and the traffic flow for the relevant peaks hours at Junction 16 is considered and is presented in **Table 7-1** below.

	Assessment Period	Junction 16A (Tot. PCUs)	Junction 16B (Tot. PCUs)
2025 (Year of Opening/YoO)	AM Peak (08:15-09:15)	36	42
	PM Peak (16:15-17:15)	28	36

Table 7-1: *Committed Development Traffic Through Relevant Junctions*

7.4 Trip Distribution

Vehicular traffic expected to utilise the proposed Park and Ride site is estimated by performing a demand analysis using East Regional Model on N11 near Junction 16 for different years. As discussed in **Section 5** of this report, the traffic utilising the proposed Park and Ride site will access/exit the site using Junction 16A (Western Roundabout), 16B (Eastern Roundabout), and Junction 2. Based on this, the following assumptions for trip distribution in the road network have been made for all the trips to/from the Park and Ride site and the committed development:

1. Ashford Rathnew Park and Ride facility is one of the 3 road-based Park and Ride facilities proposed along M11 to attract on route car users going to the Dublin City Centre. This facility is

expected to attract car users coming from the south of Junction 16 along M11. Therefore, it is assumed that all the car traffic utilising Park and Ride facility will and enter/exit the site through Junction 2 and Junction 16 via R772 West arm.

2. Additional 20% of the total number of Park and Ride car traffic will be pick-up and drop-off traffic. Therefore, these trips will be counted twice in each peak hour in the demand utilised for traffic modelling.
3. It is assumed that 100% of the Park and Ride car traffic will enter the site using M11 South arm of Junction 16A, and exit using the R772 ramp followed by M11 South arm of Junction 16B.
4. Existing bus services in the nearby area are proposed to be rerouted to serve the Park and Ride site. It is assumed that the buses going towards Dublin City Centre will access/exit the site using M11 arm of Junction 16A. The buses which will be returning from the city will access/exit the site using R772 ramp, and N11 arm of Junction 16B. Bus lines 133/133X will follow the existing route and enter the site using R772 East arm of Junction 16B and go towards Dublin city from the west, without using J16, following the R772 West arm.
5. Committed Developments in the nearby areas will generate traffic of which a certain proportion will pass through Junction 16. The committed development's traffic flow and its distribution is referenced from the data available on the development on Co. Wicklow's planning permission website.
6. For traffic modelling of Junction 2, it is assumed that all the traffic turning in to the R772 west arm arm from Junction 16 will go straight, except for the traffic accessing the Park and Ride facility. Traffic entering the Park and Ride facility would turn right from R772 West arm to enter the site. Traffic exiting the Park and Ride facility is assumed to turn left from the facility into R772 West arm to go towards Junction 16.

7.5 Do-Nothing Traffic Flows

Taking in consideration the trip distribution assumptions presented in preceding sections, the figures presented in **Table 7-1** have been added to the background traffic forecast presented in **Table 4-1** and **Table 4-2** to estimate the turning movements at junctions in the 'do-nothing' scenario future years, i.e., 2025, 2030, and 2040. The total do-nothing approach flows are presented in **Table 7-2** and **Table 7-3**, which follows. Do Nothing flows for Junction 2 are irrelevant, as there is no development on the site in this scenario, and the junction will be upgraded and utilised to access the Park and Ride site in Do Something scenarios.

Assessment Period	Do-Nothing Traffic Through Junction 16A (PCUs)		
	YoO (2025)	YoO+5 (2030)	YoO+15 (2040)
AM Peak (08:15-09:15)	1419	1419	1419
PM Peak (16:15-17:15)	1279	1279	1279

Table 7-2: *Junction 16A Do-Nothing Traffic Flows (PCUs)*

Assessment Period	Do-Nothing Traffic Through Junction 16B (PCUs)		
	YoO (2025)	YoO+5 (2030)	YoO+15 (2040)
AM Peak (08:15-09:15)	1733	1733	1733
PM Peak (16:15-17:15)	1851	1851	1851

Table 7-3:*Junction 16B Do-Nothing Traffic Flows (PCUs)*

7.6 Proposed Development Trip Generation

The vehicle trip generation estimated for the proposed development is presented in Table 5-1**:** Proposed Development Estimated Trip Generation-Vehicles

These trip generation values were converted to Passenger Car Units to input into the model with the following factors assumed: *medium goods vehicles 1.5, bus 2.0, and HGV 2.3. Source: TII, Project Appraisal Guidelines for National Roads Unit 5.2 (October 2016).*

7.7 Mode Split

The proposed development is a Park and Ride facility with car parking, bicycle parking, car drop off area and bus shelter area. Some trips to the site may be made via public transport, car drop-off, walking or on bicycle. Using the demand analysis on M11 around the South of Junction 16, number of cars utilising this Park and Ride facility has been estimated. For a worst case scenario, it has been assumed that all the demand attracted by this Park and Ride facility will access the site using cars. Additional 20% of the total car trips would be drop-offs, and rest of the car users will park in the facility to access the bus service to the Dublin City.

7.8 Do-Something Traffic Flows

As the proposed Park and Ride site will be accessed via Junction 2 and Junction 16, 100% of the development trip generation discussed in **Section 7.6** has been added to the do-nothing traffic flows presented in **Section 7.5** to estimate the 'do-something' traffic volumes for the junctions under study. The traffic figures for 2025, 2030 and 2040 with the proposed development in place are presented within **Table 7-5**, **Table 7-5** and **Table 7-6**, which follows.

Assessment Period	Do-Something Traffic Through Junction 2 (PCUs)		
	YoO (2025)	YoO+5 (2030)	YoO+15 (2040)
AM Peak (08:15-09:15)	878	877	912
PM Peak (16:15-17:15)	896	913	948

Table 7-4: *Do-Something Traffic Flows (PCUs) for Junction 2*

Assessment Period	Do-Something Traffic Through Junction 16A (PCUs)		
	YoO (2025)	YoO+5 (2030)	YoO+15 (2040)
AM Peak (08:15-09:15)	1481	1499	1534
PM Peak (16:15-17:15)	1343	1360	1395

Table 7-5: *Do-Something Traffic Flows (PCUs) for Junction 16A*

Assessment Period	Do-Something Traffic Through Junction 16B (PCUs)		
	YoO (2025)	YoO+5 (2030)	YoO+15 (2040)
AM Peak (08:15-09:15)	1751	1753	1758
PM Peak (16:15-17:15)	1901	1916	1946

Table 7-6: *Do-Something Traffic Flows (PCUs) for Junction 16B*

The traffic figures presented above have been used as an input to the capacity analysis undertaken to assess the traffic impacts of the proposed Park and Ride facility on Junction 2, Junction 16A and 16B. This is discussed within **Section 8** of this Report.

8 Proposed Development Traffic Impact

8.1 Introduction

This section of the TTA Report sets out the approach pursued in assessing the proposed Park and Ride facility's traffic impacts and its findings. The industry standard ARCADY modelling software has been used for predicting capacities, queues, and delays of priority double roundabout Junction 16 (16A and 16B), and PICADY modelling software has been used to model the proposed priority Junction 2.

8.2 Analysis Scope, Assessment Years and Time Periods, and Assessment Scenarios

Analysis Scope

The analysis presented within this Report has focused on assessing the impact of the proposed Park and Ride facility on the priority double roundabout Junction 16 (16A and 16B) and the proposed priority Junction 2.

Assessment Years and Time Periods

As recommended by TII's TTA Guidelines, four assessment years are considered, namely: base year (2022), year of opening (YoO) which is assumed to be 2025; future year (YoO+5) i.e., 2030, and a horizon year (YoO+15), i.e., 2040. The assessment will focus on the critical time periods for the local road network i.e., the AM peak (08:15-09:15hrs) and the PM peak period (16:15hrs-17:15hrs) for assessing the proposed development's traffic impact.

Assessment Scenarios

The following scenarios have been developed in assessing the proposed development's traffic impacts:

- **Do-Nothing Scenario**: To assess the traffic impact of the development proposals on the local road network, it is first necessary to establish background traffic conditions without the proposed development, also referred to as the 'do-nothing' scenario. Such background traffic flows have been determined from the traffic survey detailed in **Section 4.4** of this Report and discussed in **Section 7.5**. The committed development traffic presented in **Section 7.3** has been accounted for in the do-nothing scenario.
- **Do-Something Scenario**: The with-development or 'do-something' scenario represents traffic conditions following the completion and the start of operation of the proposed Park and Ride site, i.e., do-nothing plus additional traffic expected to utilise the Park and Ride facility. The estimated do-something traffic flows are presented within **Section 7.8** of this Report.

8.3 Traffic Modelling Software and Outputs

Traffic Modelling Software

The industry standard ARCADY traffic modelling software has been used to assess the existing double roundabout (Junction 16A and 16B) under study, and predict its capacities, queues, and delays for different scenarios. The industry standard PICADY traffic modelling software has been used to assess the proposed junction (Junction 2) under study, and predict its capacities, queues, and delays for different Do-Something scenarios. ARCADY (Junctions 10 software) is used for modelling the impact of traffic flows on priority roundabouts and PICADY is used for modelling the impact of traffic flows on priority junctions. Such models analyse the junctions with respect to their geometry and traffic flows and calculate key performance indicators such as Ratio to Flow Capacity (RFC) for the models.

Traffic Modelling Outputs.

Outputs obtained from the ARCADY and PICADY models are listed below:

- Queue Length (PCU): The values are the total number of queueing vehicles on the arm in PCUs.
- Junction Delay (seconds): This is the total delay experienced by a quantity of traffic at a particular junction in a given time period.
- Ration of Flow to Capacity (RFC): 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.
- LOS (Level of Service) – is a qualitative measure used to relate the quality of motor vehicle traffic service. It is a term used to qualitatively describe the operating conditions of a roadway based on factors such as speed, travel time, manoeuvrability, delay, and safety. There are six LOS ranging from A (free flow) to F (Forced or breakdown flow).

8.4 Modifications to Road Network

Junction 16 is a priority double roundabout interchange connecting M11 with R772, and access roads to residential areas. The layout of the existing roundabout can be seen in **Figure 4-2**. To study the traffic impacts of the proposed Park and Ride site on this roundabout, the two inter-connected roundabouts are modelled independently as two standard roundabouts. The Western Roundabout is referred to as Junction 16A and the Eastern Roundabout is referred to as Junction 16B. The results showing the performances of both the models are discussed in **Section 8.5** below.

8.5 Traffic Modelling Results

8.5.1 Junction- 16A

Junction 16A is considered here to be the Western Roundabout of Junction 16. Traffic Modelling results obtained for this roundabout in different scenarios are presented below.

8.5.1.1 AM Peak

Comparison of the junction's performance for the different AM Peak scenarios are shown in **Table 8-1** below. ARCADY modelling results have been included within Appendix B of this Report.

Assessment Year	AM Peak (08:00 - 09:00 hrs)				
	Scenario	Max Ratio of Flow to Capacity (RFC)	Maximum Queue (PCU)	Level of Service (LOS)	Junction Delay (Seconds)
Year of Opening 2024	Do-Nothing	0.37	0.6	A	3.39
	Do-Something	0.44	0.8	A	3.72
Year of Opening +5 2029	Do-Nothing	0.38	0.6	A	3.37
	Do-Something	0.46	0.9	A	3.71
Year of Opening + 15 2039	Do-Nothing	0.39	0.7	A	3.38
	Do-Something	0.47	0.9	A	3.75

Table 8-1: *AM Peak Traffic Modelling Results for J16A*

The results obtained for the AM Peak traffic modelling show that the junction is expected to perform within acceptable levels in all assessed years and scenarios. The Level of Service remains at Level A for all the scenarios. In the Do Something scenarios, the maximum RFC obtained is 0.63, which occurs across all temporal scenarios, an increase of 0.01 from the respective Do Nothing scenarios. Similarly the Proposed Development has a maximum queue of 1.7 PCUs across the Do Nothing scenarios and 1.8PCUs across the Do Something scenarios. This is due to the fact that the volume of traffic is so low, the junction is effectively operating in free-flow for the predicted baseline volumes. The predicated traffic volumes associated with the Proposed Development are not of a high enough magnitude to change this free flow of movement substantially. This shown by the LoS being Level A for all scenarios assessed. The maximum overall delay obtained f is 5.94 seconds in the Do Something Year of Opening + 15 years scenarios which is the expected result. This value is comparable with the overall of junction delay of 5. 91 seconds for the Do Nothing Year of Opening scenario.

8.5.1.2 PM Peak

Comparison of the junction's performance for the different PM Peak scenarios are shown in **Table 8-2** below. ARCADY modelling results have been included within Appendix B of this Report.

Assessment Year	PM Peak (16:15 - 17:15 hrs)				
	Scenario	Max Ratio of Flow to Capacity (RFC)	Maximum Queue (PCU)	Level of Service (LOS)	Junction Delay (Seconds)
Base Year 2022	Do Nothing	0.56	1.3	A	5.09
Year of Opening 2025	Do-Nothing	0.58	1.4	A	5.23
	Do-Something	0.58	1.4	A	5.32
Year of Opening +5 2030	Do-Nothing	0.58	1.4	A	5.23
	Do-Something	0.58	1.4	A	5.34
Year of Opening + 15 2040	Do-Nothing	0.58	1.4	A	5.23
	Do-Something	0.58	1.4	A	5.39

Table 8-2: *PM Peak Traffic Modelling Results for J16A*

The results obtained for the 'do-something' scenarios presented above show that, with the proposed Park and Ride in place, the junction will continue to operate successfully in all future years. In the Year of Opening, the maximum RFC obtained was 0.58, which occurs with or without the Proposed Development across all temporal scenarios. Similarly, the Proposed Development has a maximum queue of 1.4 PCU across all scenarios. This is due to the fact that the volume of traffic is so low, the junction is effectively operating in free-flow for the predicted baseline volumes. The predicated traffic volumes associated with the Proposed Development are not significant enough to change this free flow of movement. This shown by the LoS being Level A for all scenarios assessed. The maximum overall delay obtained f is 5.39 seconds in the Do Something Year of Opening + 15 years scenarios which is the expected result. This value is comparable with the overall of junction delay of 5.23 seconds for the Do Nothing Year of Opening scenario..

On that basis, the traffic impact of the proposed development can be described as ***long-term, neutral,*** and ***imperceptible.*** Detailed modelling results of all the scenarios are included as Appendix B of this Report.

8.5.2 Junction- 16B

Junction 16B is considered to be the Eastern Roundabout of Junction 16. Traffic Modelling results obtained for this roundabout in different scenarios are presented below.

8.5.2.1 AM Peak

Comparison of the junction's performance for the different AM Peak scenarios are shown in **Table 8-3** ARCADY modelling results have been included within Appendix B of this Report.

Assessment Year	AM Peak (08:15 - 09:15 hrs)				
	Scenario	Max Ratio of Flow to Capacity (RFC)	Maximum Queue (PCU)	Level of Service (LOS)	Junction Delay (Seconds)
Base Year 2022	**Do Nothing**	0.66	2.1	A	5.82
Year of Opening 2025	**Do-Nothing**	0.68	2.2	A	6.02
	Do-Something	0.68	2.2	A	6.11
Year of Opening +5 2030	**Do-Nothing**	0.68	2.2	A	6.02
	Do-Something	0.68	2.2	A	6.11
Year of Opening + 15 2040	**Do-Nothing**	0.68	2.2	A	6.02
	Do-Something	0.68	2.2	A	6.11

Table 8-3: *AM Peak Traffic Modelling Results for J16B*

The results obtained for the AM Peak traffic modelling show that the junction is expected to perform within acceptable levels in all assessed years and scenarios. The Level of Service remains at Level A for all the scenarios. The RFC and Maximum Queue values are unchanged across the assessment scenarios from the Year of Opening, Year of Opening +_5 and Year of Opening +15 at values of 0.68 and 2.2 respectively. The predicated traffic volumes associated with the Proposed Development are not significant enough to change the flow of movement at the junction. This shown by the LoS being Level A for all scenarios assessed. The maximum overall delay obtained f is 6.11 seconds in the Do Something Year of Opening + 15 years scenarios which is the expected result. This value is comparable with the overall of junction delay of 6.02 seconds for the Do Nothing Year of Opening scenario.

8.5.2.2 PM Peak

Comparison of the junction's performance for the different PM Peak scenarios are shown in **Table 8-4** below. ARCADY modelling results have been included within Appendix B of this Report.

Assessment Year	PM Peak (16:15 - 17:15 hrs)				
	Scenario	Max Ratio of Flow to Capacity (RFC)	Maximum Queue (PCU)	Level of Service (LOS)	Junction Delay (Seconds)
Base Year 2022	**Do Nothing**	0.63	1.8	A	5.62
Year of Opening 2025	**Do-Nothing**	0.65	1.9	A	5.79
	Do-Something	0.65	1.9	A	5.90
Year of Opening +5 2030	**Do-Nothing**	0.65	1.9	A	5.79
	Do-Something	0.65	1.9	A	5.92
Year of Opening + 15 2040	**Do-Nothing**	0.65	1.9	A	5.79
	Do-Something	0.65	1.9	A	5.96

Table 8-4: *PM Peak Traffic Modelling Results for J16B*

The results obtained for the 'do-something' scenarios presented above show that, with the proposed Park and Ride in place, the junction will continue to operate successfully in all future years. The RFC and Maximum Queue values are unchanged across the assessment scenarios from the Year of Opening, Year of Opening +_5 and Year of Opening +15 at values of 0.65 and 1.9 respectively. The predicated traffic volumes associated with the Proposed Development are not significant enough to change the flow of movement at the junction. This shown by the LoS being Level A for all scenarios assessed. The maximum overall delay obtained f is 5.96 seconds in the Do Something Year of Opening + 15 years scenarios which is the expected result. This value is comparable with the overall of junction delay of 5.79 seconds for the Do Nothing Year of Opening scenario.

Junction 16A and 16B are separated by R772 arm, and the distance between these roundabouts is approximately around 110 meters. The detailed results from traffic modelling (refer Appendix B) show that the maximum queue obtained on the arm separating the two junctions (R772) is significantly below the maximum capacity. Therefore, the assumption to model the two roundabouts independently holds valid here.

On that basis, the traffic impact of the proposed development can be described as ***long-term, neutral,*** and ***imperceptible.*** Detailed modelling results of all the scenarios are included as Appendix B of this Report.

8.5.3 Junction- J2

Junction 2 is the proposed priority junction which will be used to access the proposed Park and Ride site. Traffic modelling results of this junction are discussed in detail below.

8.5.3.1 AM Peak

Comparison of the junction's performance for the different AM Peak scenarios are shown in **Table 8-5** PICADY modelling results have been included within Appendix B of this Report.

Assessment Year	AM Peak (08:15 - 09:15 hrs)				
	Scenario	Max Ratio of Flow to Capacity (RFC)	Maximum Queue (PCU)	Level of Service (LOS)	Junction Delay (Seconds)
YoO 2025	Do-Something	0.10	0.1	A	0.75
YoO +5 2030	Do-Something	0.13	0.2	A	0.92
YoO + 15 2040	Do-Something	0.20	0.3	A	1.27

Table 8-5: *AM Peak Traffic Modelling Results for J2*

The results obtained for the AM Peak traffic modelling show that the junction is expected to perform within acceptable levels in all assessed years and scenarios. The Level of Service remains at Level A for all the scenarios. A maximum RFC of 0.10 with an overall delay of 0.75 seconds were obtained in the do-something scenario of the Year of Opening In the Year of Opening + 15, the RFC and Maximum Queue values increase by 100% and 200% respectively. Whilst this represents a large percentage increase, the magnitude of the increases of 0.1 for the RFC and 0.2 for the Maximum Queue are relatively minor. The predicted traffic flows associated with the Proposed Development is sufficiently catered for within the junction residual capacity and represents the planned growth for the area.

8.5.3.2 PM Peak

Comparison of the junction's performance for the different AM Peak scenarios are shown in **Table 8-6**

PICADY modelling results have been included within Appendix B of this Report.

Assessment Year	PM Peak (16:15 - 17:15 hrs)				
	Scenario	Max Ratio of Flow to Capacity (RFC)	Maximum Queue (PCU)	Level of Service (LOS)	Junction Delay (Seconds)
YoO 2025	**Do-Something**	0.09	0.1	A	0.63
YoO +5 2030	**Do-Something**	0.12	0.2	A	0.76
YoO + 15 2040	**Do-Something**	0.18	0.2	A	1.04

Table 8-6: *PM Peak Traffic Modelling Results for J2*

The results obtained for the PM Peak traffic modelling show that the junction is expected to perform within acceptable levels in all assessed years and scenarios. The Level of Service remains Level A for all the scenarios. A maximum RFC of 0.09 with an overall delay of 0.63 seconds were obtained in the do-something scenario of the Year of Opening. Similarly to the AM peak, there is a large percentage increase in the considered metrics from the Year of Opening to the Year of Opening + 15 but this is accompanied by a relatively low increase in magnitude. Therefore, the predicted traffic flows associated with the Proposed Development are sufficiently catered for within the junction residual capacity and represents the planned growth for the area.

On that basis, the traffic impact of the proposed development can be described as ***long-term, neutral,*** and ***imperceptible.*** Detailed modelling results of all the scenarios are included as Appendix B of this Report.

8.6 Other Impacts Associated with the Proposed Development

8.6.1 Environmental Impact

The proposed development will not generate a significant volume of additional vehicular traffic during construction or operational phases. The level of traffic increase is not likely to have any adverse transport-related environmental effects in terms of noise, air quality, vibrations, etc. The environmental impact of the construction period will be ***short-term*** and ***not significant*** in nature.

8.6.2 Construction Stage Impact

The potential impacts resulting from construction works for the proposed development are outlined in **Table 8-7** below. It should be noted that these impacts would be ***short-term, negative,*** and ***not significant,*** and are not expected to result in significant residual impact.

Activities	Potential Impact	Significance of Effects	Duration of Effects
Transportation of site machinery and materials	• Delay and inconvenience to existing traffic on the road network. • Noise/disturbance to other properties in the area. • Dust raised by construction traffic. • Dirt and mud dragged onto the road by construction traffic.	**Moderate**	**Temporary**

Table 8-7: *Potential Impacts During Construction Stage*

9 Road Safety

9.1 Effect of Proposed Development

9.1.1 Internal Traffic

The proposed Park and Ride site is accessible via the R772 West arm, followed by a proposed priority junction at an existing access. The car parks, set down area for car drop-offs/pick-ups and bus shelters inside the proposed site are accessible through an internal road network which has been designed to give clear, legible routes for pedestrians, cyclists, and motorists to enter and exit. The proposed internal road network is designed to facilitate all future traffic movements.

9.1.2 External Traffic

Design of the proposed car parks, set down area and bus shelters accesses onto the internal road and R772 West arm will ensure adequate sightlines for all road users.

10 Remedial and Mitigation Measures

10.1 Operational Stage

10.1.1 Vehicular Traffic

The existing access along R772 West arm at the entrance of the proposed Park and Ride site will be upgraded to an all movement priority junction. The junction will be operational with the proposed Park and Ride Site in 2025. A new 50m long and 3m wide right-turning lane will be built on R772 as part of the proposed junction by realigning the existing eastbound lane towards north to facilitate the local widening.

10.1.2 Active Modes

During the operational phase of the development the following measures will be put in place to improve pedestrian and cyclist facilities:

1. Internal road markings through the carparks to highlight pedestrian routes.
2. Dropped kerbs at building entrances to enable easier access.
3. 20 no. bicycle parking Sheffield stands, 20 no. bike lockers will be provided within the site to facilitate cyclists wishing to avail this facility.

10.2 Construction Stage

During the construction phase of the development, the following measures will be put in place to reduce the impact on the surrounding environment:

1. The contractor will be required to provide wheel cleaning facilities, and regular cleaning of the R772 West road will be carried out.
2. Temporary car parking facilities for the construction workforce will be provided within the site and the surface of the car park will be prepared and finished to a standard sufficient to avoid mud spillage onto adjoining roads.
3. Monitoring and control of construction traffic will be ongoing during construction works.

11 Conclusion

The proposed Park and Ride facility site covers a total area of 23,000 sq. meters. It will consist of a new car parking area with 210 car parking spaces, set-down areas and taxi ranks with dedicated access. Bus service will be provided for the people from the Park and Ride site to Dublin city centre and vice versa. A new bus standing area is proposed with a dedicated turning circle, 2 new bus bays and 2 passenger shelters. 20 no. bicycle parking Sheffield stands, and 20 no. bike lockers will also be provided within the site to cater for cyclists accessing the facility.

The proposed site is a part of the 13 strategic park and ride facilities to be provided by NTA's Park and Ride Development Office in the Greater Dublin Area. The overall objectives of the proposed Park and Ride development are:

- To maximise the opportunities provided by on-going investment in public transport infrastructure and services, particularly in relation to the commencement of service of new public transport projects.
- To provide the appropriate type and scale of Park and Ride at the right locations, with connectivity to the road and public transport networks and design that supports integration with the surrounding walking and cycling network.
- Reduce reliance on the private car, reduce distances travelled by car and ensure Park and Ride facilitates greater use of sustainable modes.
- Deliver an enhanced customer experience through safe, secure, and user-friendly facilities that consider opportunities for interchange and to address barriers to public transport use.

The proposed site is reasonably close (circa 180m) to the M11 motorway and will be accessed majorly from the M11 via Junction 16 followed by the existing regional road- R772 (West arm of J16-A). As a part of the proposal, the existing access to the proposed Park and Ride site located on the single carriageway road R772 West arm will be upgraded into an all movement priority junction to be used to enter and exit the Park and Ride facility.

It is anticipated that the proposed development will become operational by 2025.

The estimated daily usage of the proposed Park and Ride facility is 204 no. car trips in the year of opening 2025 (the numbers are based on the demand analysis using ERM conducted by PRDO). The peak hours in the vicinity of the site are determined to be 08:15-09:15 AM and 16:15-17:15 PM, and the overall trips are likely to be concentrated around the peak hours due to the nature of the development's operations. Existing bus services in the nearby area are proposed to be rerouted to go through the proposed Park and Ride site in order to serve the people going to/coming from Dublin city.

During the opening year (2025), the proposed development will have the following traffic impacts on Junction 16. *(Note: The impact of other committed developments has been taken into consideration while performing traffic analysis):*

- Overall junction delay on the Western Roundabout (16A) is expected to increase by 1% and 2% respectively during the AM and PM peak hours;
- On the Eastern Roundabout (16B) the junction delay is expected to increase by 1% and 2%; respectively during the AM and PM peak hours;
- Mean max-queues on the R772 West arm of J16-A is expected to increase by 0.1 pcu during the AM peak and 0.2 pcu during the PM peak from the year of opening 2025 (Do Nothing) to the horizon year 2040 (Do Something);
- Mean max-queues on the R772 ramp arm of the western roundabout is expected to increase by 0.2 pcu during the AM peak and 0.1 pcu during the PM peak from the year of opening 2025 to the horizon year 2040. On the eastern roundabout R772 ramp arm, the mean max-queue is expected to increase by 0.1 pcu during the AM peak and 0.2 pcu during the PM peak.

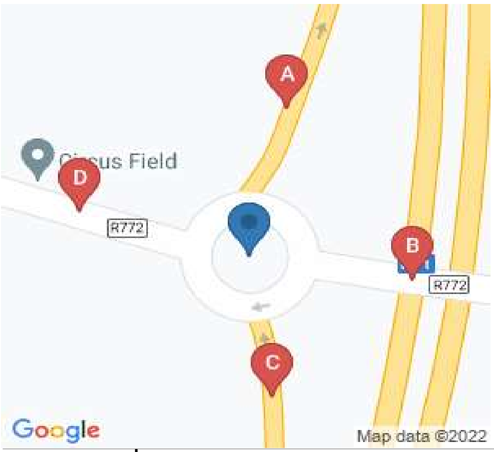
The modelling results obtained shows that the junction will operate at a Level of Service A, with or without this proposed development. While the performance of the junction does become slightly lower, as would be expected with the opening of the proposed development, it should be noted that the impact of the development is minor and that the reduced performance of the junction is for the most part due to background traffic growth.

On that basis, the traffic impact of the operational phase of the proposed development can be described as ***long-term***, ***neutral*** and ***imperceptible***.

During construction stage the impact of the proposed development is expected to be ***short-term***, ***negative*** and ***not significant***.

Appendices

Appendix A: Survey Data



IDASO

Survey Name: 353 22526 Park and Ride Deve
Site: Site 9.1
Location: Northbound on-ramp to M11/
Date: Thu 29-Sep-2022

					A => A								
TIME	**P/C**	**M/C**	**CAR**	**TAXI**	**CARS**	**LGV**	**OGV1**	**OGV2**	**PSV**	**TOT**	**PCU**	**P/C**	**M/C**
07:00	0	0	0	0		0	0	0	0	0	0	0	0
07:15	0	0	0	0		0	0	0	0	0	0	0	0
07:30	0	0	0	0		0	0	0	0	0	0	0	0
07:45	0	0	0	0		0	0	0	0	0	0	0	0
H/TOT	0	0	0	0		0	0	0	0	0	0	0	0
08:00	0	0	0	0		0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0		0	0	0	0	0	0	0	0
09:30	0	0	0	0		0	0	0	0	0	0	0	0
09:45	0	0	0	0		0	0	0	0	0	0	0	0
H/TOT	0	0	0	0		0	0	0	0	0	0	0	0
10:00	0	0	0	0		0	0	0	0	0	0	0	0
10:15	0	0	0	0		0	0	0	0	0	0	0	0
10:30	0	0	0	0		0	0	0	0	0	0	0	0
10:45	0	0	0	0		0	0	0	0	0	0	0	0
H/TOT	0	0	0	0		0	0	0	0	0	0	0	0
11:00	0	0	0	0		0	0	0	0	0	0	0	0
11:15	0	0	0	0		0	0	0	0	0	0	0	0
11:30	0	0	0	0		0	0	0	0	0	0	0	0
11:45	0	0	0	0		0	0	0	0	0	0	0	0
H/TOT	0	0	0	0		0	0	0	0	0	0	0	0
12:00	0	0	0	0		0	0	0	0	0	0	0	0
12:15	0	0	0	0		0	0	0	0	0	0	0	0
12:30	0	0	0	0		0	0	0	0	0	0	0	0
12:45	0	0	0	0		0	0	0	0	0	0	0	0
H/TOT	0	0	0	0		0	0	0	0	0	0	0	0
13:00	0	0	0	0		0	0	0	0	0	0	0	0
13:15	0	0	0	0		0	0	0	0	0	0	0	0
13:30	0	0	0	0		0	0	0	0	0	0	0	0
13:45	0	0	0	0		0	0	0	0	0	0	0	0

H/TOT	0	0	0	0		0	0	0	0	0	0	0	0
14:00	0	0	0	0		0	0	0	0	0	0	0	0
14:15	0	0	0	0		0	0	0	0	0	0	0	0
14:30	0	0	0	0		0	0	0	0	0	0	0	0
14:45	0	0	0	0		0	0	0	0	0	0	0	0
H/TOT	0	0	0	0		0	0	0	0	0	0	0	0
15:00	0	0	0	0		0	0	0	0	0	0	0	0
15:15	0	0	0	0		0	0	0	0	0	0	0	0
15:30	0	0	0	0		0	0	0	0	0	0	0	0
15:45	0	0	0	0		0	0	0	0	0	0	0	0
H/TOT	0	0	0	0		0	0	0	0	0	0	0	0
16:00	0	0	0	0		0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0		0	0	0	0	0	0	0	0
17:30	0	0	0	0		0	0	0	0	0	0	0	0
17:45	0	0	0	0		0	0	0	0	0	0	0	0
H/TOT	0	0	0	0		0	0	0	0	0	0	0	0
18:00	0	0	0	0		0	0	0	0	0	0	0	0
18:15	0	0	0	0		0	0	0	0	0	0	0	0
18:30	0	0	0	0		0	0	0	0	0	0	0	0
18:45	0	0	0	0		0	0	0	0	0	0	0	0
H/TOT	0	0	0	0		0	0	0	0	0	0	0	0
12 TOT	0	0	0	0	0	0	0	0	0	0	0	0	0

elopment Office: Request for Quotations for Traffic Surveys in at 5 locations on the M4, M7 and N/M11

/ R772/ Northbound off-ramp of M11 / R772

		A => B										A => C		
CAR	TAXI	CARS	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CARS	LGV	OGV1	OGV2
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0

0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0		0	0	0	0	0	0	0	0		0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

						A => D							
PSV	**TOT**	**PCU**	**P/C**	**M/C**	**CARS**	**LGV**	**OGV1**	**OGV2**	**PSV**	**TOT**	**PCU**	**P/C**	**M/C**
0	0	0	0	0		0	0	0	0	0	0	0	1
0	0	0	0	0		0	0	0	0	0	0	0	0
0	0	0	0	0		0	0	0	0	0	0	0	0
0	0	0	0	0		0	0	0	0	0	0	0	1
0	0	0	0	0		0	0	0	0	0	0	0	2
0	0	0	0	0		0	0	0	0	0	0	0	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0		0	0	0	0	0	0	0	0
0	0	0	0	0		0	0	0	0	0	0	0	0
0	0	0	0	0		0	0	0	0	0	0	0	0
0	0	0	0	0		0	0	0	0	0	0	0	0
0	0	0	0	0		0	0	0	0	0	0	0	0
0	0	0	0	0		0	0	0	0	0	0	0	0
0	0	0	0	0		0	0	0	0	0	0	0	0
0	0	0	0	0		0	0	0	0	0	0	0	0
0	0	0	0	0		0	0	0	0	0	0	0	0
0	0	0	0	0		0	0	0	0	0	0	0	0
0	0	0	0	0		0	0	0	0	0	0	0	0
0	0	0	0	0		0	0	0	0	0	0	0	1
0	0	0	0	0		0	0	0	0	0	0	0	0
0	0	0	0	0		0	0	0	0	0	0	0	1
0	0	0	0	0		0	0	0	0	0	0	0	0
0	0	0	0	0		0	0	0	0	0	0	0	0
0	0	0	0	0		0	0	0	0	0	0	0	0
0	0	0	0	0		0	0	0	0	0	0	0	0
0	0	0	0	0		0	0	0	0	0	0	0	0
0	0	0	0	0		0	0	0	0	0	0	0	0
0	0	0	0	0		0	0	0	0	0	0	0	1
0	0	0	0	0		0	0	0	0	0	0	0	1
0	0	0	0	0		0	0	0	0	0	0	0	0

0	0	0	0	0		0	0	0	0	0	0	0	2
0	0	0	0	0		0	0	0	0	0	0	0	0
0	0	0	0	0		0	0	0	0	0	0	0	0
0	0	0	0	0		0	0	0	0	0	0	0	1
0	0	0	0	0		0	0	0	0	0	0	0	0
0	0	0	0	0		0	0	0	0	0	0	0	1
0	0	0	0	0		0	0	0	0	0	0	0	0
0	0	0	0	0		0	0	0	0	0	0	0	0
0	0	0	0	0		0	0	0	0	0	0	0	1
0	0	0	0	0		0	0	0	0	0	0	0	0
0	0	0	0	0		0	0	0	0	0	0	0	1
0	0	0	0	0		0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	1
0	0	0	0	0		0	0	0	0	0	0	0	0
0	0	0	0	0		0	0	0	0	0	0	0	0
0	0	0	0	0		0	0	0	0	0	0	0	0
0	0	0	0	0		0	0	0	0	0	0	0	1
0	0	0	0	0		0	0	0	0	0	0	0	0
0	0	0	0	0		0	0	0	0	0	0	0	0
0	0	0	0	0		0	0	0	0	0	0	0	0
0	0	0	0	0		0	0	0	0	0	0	0	0
0	0	0	0	0		0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	9

B => A											B => B			
CAR	TAXI	CARS	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CARS	LGV	OGV1	OGV2
171	0		34	4	3	0	213	218.3	0	0		0	0	0
133	0		29	4	1	0	167	170.3	0	0		0	0	0
141	0		21	3	3	0	168	173.4	0	0		0	0	0
119	0		15	5	3	2	145	152.8	0	0		0	0	0
564	0		99	16	10	2	693	714.8	0	0		0	0	0
105	0		20	10	3	2	141	151.3	0	0		0	0	0
127	0	127	22	4	6	1	160	170.8	0	0	0	0	0	0
130	1	131	20	2	5	1	159	167.5	0	0	0	0	0	0
90	0	90	13	8	1	0	112	117.3	0	0	0	0	0	0
95	2	97	12	1	2	1	113	117.1	0	0	0	0	0	0
100	1		17	0	5	1	124	131.5	0	0		0	0	0
88	1		22	3	2	1	117	122.1	0	0		0	0	0
66	1		16	4	5	0	92	100.5	0	0		0	0	0
349	5		67	8	14	3	446	471.2	0	0		0	0	0
73	1		14	1	6	0	95	103.3	0	0		0	0	0
67	3		14	5	3	0	92	98.4	0	0		0	0	0
65	1		10	6	1	1	84	89.3	0	0		0	0	0
45	1		15	0	1	1	63	65.3	0	0		0	0	0
250	6		53	12	11	2	334	356.3	0	0		0	0	0
60	2		16	4	1	1	84	88.3	0	0		0	0	0
64	0		9	4	1	1	79	83.3	0	0		0	0	0
63	1		8	2	2	0	77	80	0	0		0	0	0
48	1		10	1	2	1	63	67.1	0	0		0	0	0
235	4		43	11	6	3	303	318.7	0	0		0	0	0
59	0		10	1	2	0	72	75.1	0	0		0	0	0
50	2		15	0	1	0	68	69.3	0	0		0	0	0
59	2		12	1	1	1	76	78.8	0	0		0	0	0
74	1		9	3	2	0	89	93.1	0	0		0	0	0
242	5		46	5	6	1	305	316.3	0	0		0	0	0
66	0		10	3	2	0	81	85.1	0	0		0	0	0
67	1		7	2	3	0	81	85.3	0	0		0	0	0
79	2		9	4	5	1	101	109.9	0	0		0	0	0
56	1		8	3	2	2	72	78.1	0	0		0	0	0

268	4		34	12	12	3	335	358.4	0	0		0	0	0
74	1		10	1	5	0	91	98	0	0		0	0	0
59	0		6	4	7	2	78	91.1	0	0		0	0	0
62	0		11	7	1	2	84	90.2	0	0		0	0	0
66	2		7	4	1	0	80	83.3	0	0		0	0	0
261	3		34	16	14	4	333	362.6	0	0		0	0	0
60	0		14	4	5	0	83	91.5	0	0		0	0	0
60	1		6	2	3	1	73	78.9	0	0		0	0	0
83	1		12	2	1	1	101	103.7	0	0		0	0	0
82	0		9	1	1	0	93	94.8	0	0		0	0	0
285	2		41	9	10	2	350	368.9	0	0		0	0	0
83	4		9	0	0	1	97	98	0	0		0	0	0
82	0	82	13	1	5	1	102	110	0	0	0	0	0	0
86	1	87	12	1	1	2	103	106.8	0	0	0	0	0	0
77	2	79	16	1	1	1	98	100.8	0	0	0	0	0	0
81	0	81	13	1	2	0	98	100.5	0	0	0	0	0	0
70	0		7	1	1	0	79	80.8	0	0		0	0	0
92	1		6	2	0	1	102	104	0	0		0	0	0
70	0		6	3	0	0	79	80.5	0	0		0	0	0
313	1		32	7	3	1	358	365.8	0	0		0	0	0
73	0		6	2	0	0	81	82	0	0		0	0	0
70	1		3	0	1	0	75	76.3	0	0		0	0	0
66	0		6	0	1	1	74	76.3	0	0		0	0	0
51	0		5	0	0	0	56	56	0	0		0	0	0
260	1		20	2	2	1	286	290.6	0	0		0	0	0
3807	39	774	594	125	110	31	4715	4946.1	0	0	0	0	0	0

						B => C								
PSV	**TOT**	**PCU**	**P/C**	**M/C**	**CARS**	**LGV**	**OGV1**	**OGV2**	**PSV**	**TOT**	**PCU**	**P/C**	**M/C**	**CARS**
0	0	0	0	0		0	0	0	0	0	0	0	0	
0	0	0	0	0		0	0	0	0	0	0	0	0	
0	0	0	0	0		0	0	0	0	0	0	0	0	
0	0	0	0	0		0	0	0	0	0	0	0	1	
0	0	0	0	0		0	0	0	0	0	0	0	1	
0	0	0	0	0		0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	22
0	0	0	0	0	0	0	0	0	0	0	0	0	1	54
0	0	0	0	0	0	0	0	0	0	0	0	1	1	71
0	0	0	0	0	0	0	0	0	0	0	0	0	0	67
0	0	0	0	0		0	0	0	0	0	0	1	0	
0	0	0	0	0		0	0	0	0	0	0	0	0	
0	0	0	0	0		0	0	0	0	0	0	0	0	
0	0	0	0	0		0	0	0	0	0	0	1	0	
0	0	0	0	0		0	0	0	0	0	0	1	0	
0	0	0	0	0		0	0	0	0	0	0	1	1	
0	0	0	0	0		0	0	0	0	0	0	0	0	
0	0	0	0	0		0	0	0	0	0	0	0	0	
0	0	0	0	0		0	0	0	0	0	0	2	1	
0	0	0	0	0		0	0	0	0	0	0	1	2	
0	0	0	0	0		0	0	0	0	0	0	1	1	
0	0	0	0	0		0	0	0	0	0	0	3	0	
0	0	0	0	0		0	0	0	0	0	0	1	0	
0	0	0	0	0		0	0	0	0	0	0	6	3	
0	0	0	0	0		0	0	0	0	0	0	1	0	
0	0	0	0	0		0	0	0	0	0	0	0	0	
0	0	0	0	0		0	0	0	0	0	0	1	0	
0	0	0	0	0		0	0	0	0	0	0	1	1	
0	0	0	0	0		0	0	0	0	0	0	3	1	
0	0	0	0	0		0	0	0	0	0	0	1	0	
0	0	0	0	0		0	0	0	0	0	0	0	0	
0	0	0	0	0		0	0	0	0	0	0	0	0	
0	0	0	0	0		0	0	0	0	0	0	1	1	

0	0	0	0	0		0	0	0	0	0	0	2	1	
0	0	0	0	0		0	0	0	0	0	0	0	0	
0	0	0	0	0		0	0	0	0	0	0	0	0	
0	0	0	0	0		0	0	0	0	0	0	0	0	
0	0	0	0	0		0	0	0	0	0	0	0	1	
0	0	0	0	0		0	0	0	0	0	0	0	1	
0	0	0	0	0		0	0	0	0	0	0	0	1	
0	0	0	0	0		0	0	0	0	0	0	0	0	
0	0	0	0	0		0	0	0	0	0	0	0	0	
0	0	0	0	0		0	0	0	0	0	0	0	0	
0	0	0	0	0		0	0	0	0	0	0	0	1	
0	0	0	0	0		0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	2	0	79
0	0	0	0	0	0	0	0	0	0	0	0	1	0	67
0	0	0	0	0	0	0	0	0	0	0	0	0	0	81
0	0	0	0	0	0	0	0	0	0	0	0	0	1	55
0	0	0	0	0		0	0	0	0	0	0	1	0	
0	0	0	0	0		0	0	0	0	0	0	0	0	
0	0	0	0	0		0	0	0	0	0	0	0	0	
0	0	0	0	0		0	0	0	0	0	0	1	1	
0	0	0	0	0		0	0	0	0	0	0	2	0	
0	0	0	0	0		0	0	0	0	0	0	1	0	
0	0	0	0	0		0	0	0	0	0	0	0	0	
0	0	0	0	0		0	0	0	0	0	0	0	0	
0	0	0	0	0		0	0	0	0	0	0	3	0	
0	0	0	0	0	0	0	0	0	0	0	0	22	12	496

B => D									C => A					
LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CARS	LGV	OGV1	OGV2	PSV	TOT	PCU
8	0	0	0	22	22	0	0		0	0	0	0	4	4
12	2	1	2	37	41.3	0	0		0	0	0	0	1	1
6	1	0	1	24	25.5	0	0		0	0	0	0	1	1
11	1	0	2	42	43.9	0	0		0	0	0	0	0	0
37	4	1	5	125	132.7	0	0		0	0	0	0	6	6
7	3	0	0	30	31.5	0	0		0	0	0	0	0	0
9	3	0	2	36	39.5	0	0	0	0	0	0	0	0	0
4	0	0	0	59	58.4	0	0	3	0	0	0	0	3	3
9	3	0	0	85	85.1	0	0	2	0	0	0	0	2	2
4	5	1	0	77	80.8	0	0	2	0	0	0	0	2	2
7	1	0	1	61	61.7	0	0		0	0	0	0	1	1
5	4	0	0	44	46	0	0		0	0	0	0	0	0
4	0	0	0	55	55	0	0		0	0	0	0	3	3
20	10	1	1	237	243.5	0	0		0	0	0	0	6	6
4	1	0	0	49	48.7	0	0		0	0	0	0	0	0
6	3	0	1	39	40.1	0	0		0	0	0	0	0	0
7	1	0	0	47	47.5	0	0		0	0	0	0	1	1
4	1	0	1	50	51.5	0	0		0	0	0	0	0	0
21	6	0	2	185	187.8	0	0		0	0	0	0	1	1
7	1	0	0	47	45.5	0	0		0	0	0	0	1	1
6	0	1	1	61	61.9	0	0		0	0	0	0	0	0
5	3	0	0	55	54.1	0	0		0	0	0	0	0	0
9	3	0	0	58	58.7	0	0		0	0	0	0	0	0
27	7	1	1	221	220.2	0	0		0	0	0	0	1	1
8	0	1	1	66	67.5	0	0		0	0	0	0	0	0
6	1	0	1	73	74.5	0	0		0	0	0	0	0	0
4	1	0	0	66	65.7	0	0		0	0	0	0	0	0
3	2	0	1	78	78.6	0	0		0	0	0	0	0	0
21	4	1	3	283	286.3	0	0		0	0	0	0	0	0
6	1	0	1	64	64.7	0	0		0	0	0	0	1	1
3	3	1	1	75	78.8	0	0		0	0	0	0	0	0
3	2	0	0	61	62	0	0		0	0	0	0	0	0
5	2	0	0	72	71.6	0	0		0	0	0	0	2	2

17	8	1	2	272	277.1	0	0		0	0	0	0	3	3
3	2	0	0	50	51	0	0		0	0	0	0	1	1
4	0	0	1	60	61	0	0		0	0	0	0	0	0
3	1	0	0	69	69.5	0	0		0	0	0	0	0	0
6	0	0	0	74	73.4	0	0		0	0	0	0	0	0
16	3	0	1	253	254.9	0	0		0	0	0	0	1	1
6	0	0	1	61	61.4	0	0		0	0	0	0	0	0
7	1	0	1	67	68.5	0	0		0	0	0	0	0	0
2	0	2	0	54	56.6	0	0		0	0	0	0	0	0
7	2	0	0	76	77	0	0		0	0	0	0	0	0
22	3	2	2	258	263.5	0	0		0	0	0	0	0	0
4	1	0	0	89	89.5	0	0		0	0	0	0	1	1
14	0	1	5	101	105.7	0	0	0	0	0	0	0	0	0
14	4	0	1	87	89.2	0	0	0	0	0	0	0	0	0
11	1	0	0	93	93.5	0	0	0	0	0	0	0	0	0
9	2	0	0	67	67.4	0	0	0	0	0	0	0	0	0
9	0	0	1	84	84.2	0	0		0	0	0	0	3	3
7	1	0	0	86	86.5	0	0		0	0	0	0	1	1
9	1	0	0	73	73.5	0	0		0	0	0	0	0	0
34	4	0	1	310	311.6	0	0		0	0	0	0	4	4
2	0	0	1	83	82.4	0	0		0	0	0	0	2	2
4	0	0	1	60	60.2	0	0		0	0	0	0	0	0
5	1	0	0	51	51.5	0	0		1	0	0	0	2	2
4	0	0	0	44	44	0	0		0	0	0	0	0	0
15	1	0	2	238	238.1	0	0		1	0	0	0	4	4
302	65	8	28	2962	3008.1	0	0	7	1	0	0	0	32	32

C => B									C => C					
P/C	M/C	CARS	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CARS	LGV	OGV1	OGV2
0	0		5	1	0	0	9	9.5	0	0		0	0	0
0	0		2	0	0	1	10	11	0	0		0	0	0
0	0		2	0	0	0	4	4	0	0		0	0	0
0	0		1	0	1	0	3	4.3	0	0		0	0	0
0	0		10	1	1	1	26	28.8	0	0		0	0	0
0	0		0	0	1	0	4	5.3	0	0		0	0	0
0	0	9	0	0	1	0	10	11.3	0	0	0	0	0	0
0	0	4	2	0	0	0	6	6	0	0	0	0	0	0
0	0	7	0	0	1	0	8	9.3	0	0	0	0	0	0
0	0	4	0	0	0	0	4	4	0	0	0	0	0	0
0	0		1	0	2	0	6	8.6	0	0		0	0	0
0	0		0	0	1	0	2	3.3	0	0		0	0	0
0	0		1	0	0	0	4	4	0	0		0	0	0
0	0		2	0	3	0	16	19.9	0	0		0	0	0
0	0		1	0	0	0	3	3	0	0		0	0	0
0	0		0	0	0	0	1	1	0	0		0	0	0
0	0		0	0	1	0	2	3.3	0	0		0	0	0
0	0		0	1	0	0	1	1.5	0	0		0	0	0
0	0		1	1	1	0	7	8.8	0	0		0	0	0
0	0		0	1	1	0	3	4.8	0	0		0	0	0
0	0		1	0	1	0	4	5.3	0	0		0	0	0
0	0		2	0	0	0	5	5	0	0		0	0	0
0	0		0	0	0	0	3	3	0	0		0	0	0
0	0		3	1	2	0	15	18.1	0	0		0	0	0
0	0		5	1	1	0	9	10.8	0	0		0	0	0
0	0		0	0	0	0	1	1	0	0		0	0	0
0	0		1	0	0	0	5	5	0	0		0	0	0
0	0		1	1	0	0	4	4.5	0	0		0	0	0
0	0		7	2	1	0	19	21.3	0	0		0	0	0
0	0		1	0	2	0	7	9.6	0	0		0	0	0
0	0		0	0	1	0	6	7.3	0	0		0	0	0
0	0		0	0	1	0	5	6.3	0	0		0	0	0
0	0		1	1	0	0	4	4.5	0	0		0	0	0

0	0		2	1	4	0	22	27.7	0	0		0	0	0
0	0		0	1	0	0	1	1.5	0	0		0	0	0
0	0		0	0	0	0	2	2	0	0		0	0	0
0	0		0	0	0	0	1	1	0	0		0	0	0
0	0		0	1	0	0	3	3.5	0	0		0	0	0
0	0		0	2	0	0	7	8	0	0		0	0	0
0	0		0	0	1	0	4	5.3	0	0		0	0	0
0	0		2	0	0	0	4	4	0	0		0	0	0
0	0		0	0	1	0	3	4.3	0	0		0	0	0
0	0		1	0	0	0	2	2	0	0		0	0	0
0	0		3	0	2	0	13	15.6	0	0		0	0	0
0	0		1	0	0	0	3	3	0	0		0	0	0
0	0	3	0	1	2	0	6	9.1	0	0	0	0	0	0
0	0	3	0	0	2	0	5	7.6	0	0	0	0	0	0
0	0	3	1	1	0	0	5	5.5	0	0	0	0	0	0
0	0	2	0	0	1	0	3	4.3	0	0	0	0	0	0
0	0		0	0	2	0	3	5.6	0	0		0	0	0
0	0		0	0	0	0	1	1	0	0		0	0	0
0	0		1	0	0	0	4	4	0	0		0	0	0
0	0		1	0	3	0	11	14.9	0	0		0	0	0
0	0		0	0	0	0	1	1	0	0		0	0	0
0	0		1	0	0	0	3	3	0	0		0	0	0
0	0		0	1	0	0	1	1.5	0	0		0	0	0
0	0		1	0	0	0	3	3	0	0		0	0	0
0	0		2	1	0	0	8	8.5	0	0		0	0	0
0	0	35	35	11	24	1	191	228.7	0	0	0	0	0	0

						C => D								
PSV	TOT	PCU	P/C	M/C	CARS	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CARS
0	0	0	0	0		2	0	0	0	6	6	0	0	
0	0	0	0	0		5	0	2	0	19	21.6	0	0	
0	0	0	0	0		2	1	0	0	22	22.5	0	0	
0	0	0	0	0		6	0	0	0	16	16	0	0	
0	0	0	0	0		15	1	2	0	63	66.1	0	0	
0	0	0	0	0		4	0	2	1	19	22.6	0	0	
0	0	0	0	0	17	1	1	1	0	20	21.8	0	0	16
0	0	0	0	0	17	1	0	1	0	19	20.3	1	0	17
0	0	0	0	0	29	4	3	2	0	38	42.1	0	0	9
0	0	0	0	1	27	4	1	0	0	33	32.9	0	0	13
0	0	0	0	1		5	1	1	0	20	21.2	0	0	
0	0	0	0	0		2	0	0	0	23	23	0	0	
0	0	0	0	0		4	2	1	0	13	15.3	0	0	
0	0	0	0	2		15	4	2	0	89	92.4	0	0	
0	0	0	0	0		1	1	1	0	15	16.8	0	0	
0	0	0	0	0		4	1	1	0	15	16.8	0	0	
0	0	0	0	0		1	2	0	0	7	8	0	1	
0	0	0	0	0		0	0	2	0	12	14.6	0	0	
0	0	0	0	0		6	4	4	0	49	56.2	0	1	
0	0	0	0	0		1	0	0	0	4	4	0	0	
0	0	0	0	1		1	0	0	0	14	13.4	0	0	
0	0	0	0	0		3	1	0	0	13	13.5	0	0	
0	0	0	0	0		1	0	3	0	17	20.9	0	0	
0	0	0	0	1		6	1	3	0	48	51.8	0	0	
0	0	0	0	0		0	1	0	0	9	9.5	0	0	
0	0	0	0	0		1	2	0	0	21	22	0	0	
0	0	0	0	0		1	3	1	0	21	23.8	0	0	
0	0	0	0	0		3	1	0	0	14	14.5	0	0	
0	0	0	0	0		5	7	1	0	65	69.8	0	0	
0	0	0	0	0		1	0	0	1	14	15	0	0	
0	0	0	0	0		1	1	0	0	13	13.5	0	0	
0	0	0	0	0		1	1	1	0	11	12.8	0	0	
0	0	0	0	0		2	1	0	0	14	14.5	0	0	

0	0	0	0	0		5	3	1	1	52	55.8	0	0	
0	0	0	0	0		2	0	1	1	14	16.3	0	0	
0	0	0	0	0		2	1	1	0	15	16.8	0	1	
0	0	0	0	0		5	1	1	0	17	18.8	0	0	
0	0	0	0	0		0	0	0	0	19	19	0	0	
0	0	0	0	0		9	2	3	1	65	70.9	0	1	
0	0	0	0	1		1	1	1	0	24	25.2	0	0	
0	0	0	0	0		2	3	0	0	17	18.5	0	0	
0	0	0	0	0		1	4	0	0	14	16	0	0	
0	0	0	0	0		5	0	1	0	11	12.3	0	0	
0	0	0	0	1		9	8	2	0	66	72	0	0	
0	0	0	0	0		3	0	0	0	13	13	0	0	
0	0	0	0	0	14	2	0	0	0	16	16	0	0	7
0	0	0	0	0	15	5	0	0	0	20	20	0	0	9
0	0	0	0	0	15	2	0	0	0	17	17	0	0	6
0	0	0	0	0	7	1	0	0	1	9	10	0	1	11
0	0	0	0	0		3	1	0	0	20	20.5	0	0	
0	0	0	0	0		1	0	0	0	14	14	0	0	
0	0	0	0	0		1	0	0	0	10	10	0	0	
0	0	0	0	0		6	1	0	1	53	54.5	0	1	
0	0	0	0	0		1	0	0	0	11	11	0	0	
0	0	0	0	0		1	0	0	0	11	11	0	0	
0	0	0	0	0		0	0	0	0	9	9	0	0	
0	0	0	0	0		1	0	0	0	13	13	0	0	
0	0	0	0	0		3	0	0	0	44	44	0	0	
0	0	0	0	4	141	101	35	24	4	756	806.3	1	3	88

D => A										D => B				
LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	TAXI	CARS	LGV	OGV1	OGV2	PSV
6	0	0	0	35	35	0	0	12	0		4	1	0	1
5	0	0	0	27	27	0	0	14	0		4	0	0	0
1	1	0	0	22	22.5	0	0	27	0		15	1	1	0
2	0	0	0	13	13	0	0	43	2		11	7	0	1
14	1	0	0	97	97.5	0	0	96	2		34	9	1	2
0	1	0	0	20	20.5	0	0	47	0		6	1	0	3
0	2	0	0	18	19	0	1	60	0	60	4	1	2	1
4	0	0	0	22	21.2	0	0	66	1	67	10	3	1	0
4	0	0	0	13	13	0	0	59	1	60	4	1	1	1
2	0	0	0	15	15	0	0	82	0	82	7	4	1	0
1	0	0	0	17	17	0	1	105	0		7	3	0	1
2	1	0	0	8	8.5	0	0	52	1		3	1	1	1
1	2	0	0	17	18	0	0	62	0		6	2	0	0
6	3	0	0	57	58.5	0	1	301	1		23	10	2	2
1	0	0	0	9	9	0	0	34	0		6	1	0	0
1	0	0	0	5	5	0	0	42	1		3	0	1	1
0	0	0	0	8	7.4	1	1	50	0		5	1	2	0
0	1	0	0	8	8.5	0	0	53	2		9	2	0	1
2	1	0	0	30	29.9	1	1	179	3		23	4	3	2
1	0	0	0	14	14	0	0	37	0		3	2	2	0
3	0	0	0	12	12	2	1	56	1		3	1	0	1
1	0	0	0	8	8	1	0	52	0		9	1	0	0
3	0	0	0	9	9	1	1	50	0		2	2	1	0
8	0	0	0	43	43	4	2	195	1		17	6	3	1
2	0	0	0	9	9	0	0	52	0		9	1	3	0
1	0	0	0	10	10	1	0	65	0		5	1	0	1
1	1	0	0	12	12.5	0	1	43	0		4	1	1	1
0	1	0	0	9	9.5	0	0	48	1		4	1	0	0
4	2	0	0	40	41	1	1	208	1		22	4	4	2
3	2	0	0	15	16	0	0	60	0		5	1	0	0
0	0	0	0	11	11	1	0	47	0		4	3	1	0
0	2	0	0	13	14	0	0	41	0		2	2	2	1
0	2	0	0	11	12	0	2	75	0		6	2	0	0

3	6	0	0	50	53	1	2	223	0		17	8	3	1
5	0	0	0	17	17	0	0	69	0		7	0	0	3
0	0	0	0	14	13.4	1	2	58	0		3	0	2	1
2	0	0	0	10	10	0	0	85	0		7	1	1	0
0	1	0	0	4	4.5	0	1	52	0		8	1	0	0
7	1	0	0	45	44.9	1	3	264	0		25	2	3	4
5	0	0	0	10	10	0	0	112	4		7	0	1	0
3	0	0	0	13	13	0	0	72	1		11	2	0	0
2	0	0	0	12	12	0	1	67	0		2	2	1	2
1	0	0	0	6	6	0	0	61	0		11	1	0	0
11	0	0	0	41	41	0	1	312	5		31	5	2	2
1	0	0	0	6	6	0	0	52	1		11	2	0	1
0	1	1	0	9	10.8	1	0	59	0	59	15	3	0	1
2	2	0	0	13	14	0	0	76	1	77	10	1	0	2
5	0	0	0	11	11	0	0	64	1	65	8	1	0	1
1	0	0	0	13	12.4	2	1	73	2	75	7	3	1	0
2	0	0	0	8	8	0	0	71	0		3	1	0	0
1	0	0	0	6	6	1	1	64	0		7	0	0	3
3	0	0	0	8	8	0	0	47	0		7	1	1	2
7	0	0	0	35	34.4	3	2	255	2		24	5	2	5
0	0	0	0	8	8	0	0	44	0		6	0	0	1
1	0	0	0	10	10	2	0	49	0		5	0	0	0
1	0	0	0	7	7	2	0	61	0		5	0	0	3
0	0	0	0	6	6	0	0	51	0		1	2	0	1
2	0	0	0	31	31	4	0	205	0		17	2	0	5
80	20	1	0	581	589.7	16	14	2721	20	545	301	68	27	36

		D => C									D => D			
TOT	**PCU**	**P/C**	**M/C**	**CARS**	**LGV**	**OGV1**	**OGV2**	**PSV**	**TOT**	**PCU**	**P/C**	**M/C**	**CARS**	**LGV**
18	19.5	0	0		0	0	0	0	0	0	0	0		0
18	18	0	0		0	0	0	0	0	0	0	0		0
44	45.8	0	0		0	0	0	0	0	0	0	0		0
64	68.5	0	0		0	0	0	0	0	0	0	0		0
144	151.8	0	0		0	0	0	0	0	0	0	0		0
57	60.5	0	0		0	0	0	0	0	0	0	0		0
69	72.5	0	0	0	0	0	0	0	0	0	0	0	0	0
81	83.8	0	0	0	0	0	0	0	0	0	0	0	0	0
67	69.8	0	0	0	0	0	0	0	0	0	0	0	0	0
94	97.3	0	0	0	0	0	0	0	0	0	0	0	0	0
117	118.9	0	0		0	0	0	0	0	0	0	0		0
59	61.8	0	0		0	0	0	0	0	0	0	0		0
70	71	0	0		0	0	0	0	0	0	0	0		0
340	349	0	0		0	0	0	0	0	0	0	0		0
41	41.5	0	0		0	0	0	0	0	0	0	0		0
48	50.3	0	0		0	0	0	0	0	0	0	0		0
60	61.7	0	0		0	0	0	0	0	0	0	0		0
67	69	0	0		0	0	0	0	0	0	0	0		0
216	222.5	0	0		0	0	0	0	0	0	0	0		0
44	47.6	0	0		0	0	0	0	0	0	0	0		0
65	64.3	0	0		0	0	0	0	0	0	0	0		0
63	62.7	0	0		0	0	0	0	0	0	0	0		0
57	57.9	0	0		0	0	0	0	0	0	0	0		0
229	232.5	0	0		0	0	0	0	0	0	0	0		0
65	69.4	0	0		0	0	0	0	0	0	0	0		0
73	73.7	0	0		0	0	0	0	0	0	0	0		0
51	53.2	0	0		0	0	0	0	0	0	0	0		0
54	54.5	0	0		0	0	0	0	0	0	0	0		0
243	250.8	0	0		0	0	0	0	0	0	0	0		0
66	66.5	0	0		0	0	0	0	0	0	0	0		0
56	58	0	0		0	0	0	0	0	0	0	0		0
48	52.6	0	0		0	0	0	0	0	0	0	0		0
85	84.8	0	0		0	0	0	0	0	0	0	0		0

255	261.9	0	0		0	0	0	0	0	0	0	0		0
79	82	0	0		0	0	0	0	0	0	0	0		0
67	68.6	0	0		0	0	0	0	0	0	0	0		0
94	95.8	0	0		0	0	0	0	0	0	0	0		0
62	61.9	0	0		0	0	0	0	0	0	0	0		0
302	308.3	0	0		0	0	0	0	0	0	0	0		0
124	125.3	0	0		0	0	0	0	0	0	0	0		0
86	87	0	0		0	0	0	0	0	0	0	0		0
75	78.7	0	0		0	0	0	0	0	0	0	0		0
73	73.5	0	0		0	0	0	0	0	0	0	0		0
358	364.5	0	0		0	0	0	0	0	0	0	0		0
67	69	0	0		0	0	0	0	0	0	0	0		0
79	80.7	0	0	0	0	0	0	0	0	0	0	0	0	0
90	92.5	0	0	0	0	0	0	0	0	0	0	0	0	0
75	76.5	0	0	0	0	0	0	0	0	0	0	0	0	0
89	89.6	0	0	0	0	0	0	0	0	0	0	0	0	0
75	75.5	0	0		0	0	0	0	0	0	0	0		0
76	77.6	0	0		0	0	0	0	0	0	0	0		0
58	61.8	0	0		0	0	0	0	0	0	0	0		0
298	304.5	0	0		0	0	0	0	0	0	0	0		0
51	52	0	0		0	0	0	0	0	0	0	0		0
56	54.4	0	0		0	0	0	0	0	0	0	0		0
71	72.4	0	0		0	0	0	0	0	0	0	0		0
55	57	0	0		0	0	0	0	0	0	0	0		0
233	235.8	0	0		0	0	0	0	0	0	0	0		0
3203	3286.9	0	0	0	0	0	0	0	0	0	0	0	0	0

OGV1	OGV2	PSV	TOT	PCU	TIME		One hour	AM	PM
0	0	0	0	0	07:00	314.3	1197.7	1407.8	1250.9
0	0	0	0	0	07:15	290.2	1175.1	08:30	16:15
0	0	0	0	0	07:30	294.7	1219.8		
0	0	0	0	0	07:45	298.5	1285.3		
0	0	0	0	0					
0	0	0	0	0	08:00	291.7	1325.4		
0	0	0	0	0	08:15	334.9	1382.8		
0	0	0	0	0	08:30	360.2	1407.8		
0	0	0	0	0	08:45	338.6	1312.3		
0	0	0	0	0	09:00	349.1	1240.5		
0	0	0	0	0	09:15	359.9	1113.7		
0	0	0	0	0	09:30	264.7	965.4		
0	0	0	0	0	09:45	266.8	918.9		
0	0	0	0	0					
0	0	0	0	0	10:00	222.3	864		
0	0	0	0	0	10:15	211.6	846.9		
0	0	0	0	0	10:30	218.2	875.5		
1	0	0	1	1.5	10:45	211.9	880.6		
1	0	0	1	1.5					
0	0	0	0	0	11:00	205.2	885.3		
0	0	0	0	0	11:15	240.2	921.4		
0	0	0	0	0	11:30	223.3	931.7		
0	0	0	0	0	11:45	216.6	947.4		
0	0	0	0	0					
0	0	0	0	0	12:00	241.3	985.5		
0	0	0	0	0	12:15	250.5	1002.1		
0	0	0	0	0	12:30	239	1005.5		
0	0	0	0	0	12:45	254.7	1024.1		
0	0	0	0	0					
0	0	0	0	0	13:00	257.9	1036.9		
0	0	0	0	0	13:15	253.9	1045.8		
0	0	0	0	0	13:30	257.6	1044.8		
0	0	0	0	0	13:45	267.5	1072.5		

0	0	0	0	0			
0	0	0	0	0	14:00	266.8	1050.6
0	0	0	0	0	14:15	252.9	1102.5
0	0	0	0	0	14:30	285.3	1119.5
0	0	0	0	0	14:45	245.6	1105.5
0	0	0	0	0			
0	0	0	0	0	15:00	318.7	1125.5
0	0	0	0	0	15:15	269.9	1086.3
0	0	0	0	0	15:30	271.3	1148.7
0	0	0	0	0	15:45	265.6	1207.5
0	0	0	0	0			
0	0	0	0	0	16:00	279.5	1246.2
0	0	0	0	0	16:15	332.3	1250.9
0	0	0	0	0	16:30	330.1	1196.2
0	0	0	0	0	16:45	304.3	1156.2
0	0	0	0	0	17:00	284.2	1089.7
0	0	0	0	0	17:15	277.6	1043.9
0	0	0	0	0	17:30	290.1	981.2
0	0	0	0	0	17:45	237.8	910.8
0	0	0	0	0			
0	0	0	0	0	18:00	238.4	852
0	0	0	0	0	18:15	214.9	
0	0	0	0	0	18:30	219.7	
0	0	0	0	0	18:45	179	
0	0	0	0	0			
1	0	0	1	1.5	**12 TOT**	12899.3	

IDASO

Survey Name: 353 22526 Park and Ride Dev
Site: Site 9.2
Location: Southbound off-ramp of M11,
Date: Thu 29-Sep-2022

					A => A							
TIME	**P/C**	**M/C**	**CAR**	**TAXI**	**CARS**	**LGV**	**OGV1**	**OGV2**	**PSV**	**TOT**	**PCU**	**P/C**
07:00	0	0	0	0		0	0	0	0	0	0	0
07:15	0	0	0	0		0	0	0	0	0	0	0
07:30	0	0	0	0		0	0	0	0	0	0	0
07:45	0	0	0	0		0	0	0	0	0	0	0
H/TOT	0	0	0	0		0	0	0	0	0	0	0
08:00	0	0	0	0		0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0		0	0	0	0	0	0	0
09:30	0	0	0	0		0	0	0	0	0	0	0
09:45	0	0	0	0		0	0	0	0	0	0	0
H/TOT	0	0	0	0		0	0	0	0	0	0	0
10:00	0	0	0	0		0	0	0	0	0	0	0
10:15	0	0	0	0		0	0	0	0	0	0	0
10:30	0	0	0	0		0	0	0	0	0	0	0
10:45	0	0	0	0		0	0	0	0	0	0	0
H/TOT	0	0	0	0		0	0	0	0	0	0	0
11:00	0	0	0	0		0	0	0	0	0	0	0
11:15	0	0	0	0		0	0	0	0	0	0	0
11:30	0	0	0	0		0	0	0	0	0	0	0
11:45	0	0	0	0		0	0	0	0	0	0	0
H/TOT	0	0	0	0		0	0	0	0	0	0	0
12:00	0	0	0	0		0	0	0	0	0	0	0
12:15	0	0	0	0		0	0	0	0	0	0	0
12:30	0	0	0	0		0	0	0	0	0	0	0
12:45	0	0	0	0		0	0	0	0	0	0	0
H/TOT	0	0	0	0		0	0	0	0	0	0	0
13:00	0	0	0	0		0	0	0	0	0	0	0
13:15	0	0	0	0		0	0	0	0	0	0	0
13:30	0	0	0	0		0	0	0	0	0	0	0
13:45	0	0	0	0		0	0	0	0	0	0	0

H/TOT	0	0	0	0		0	0	0	0	0	0	0
14:00	0	0	0	0		0	0	0	0	0	0	0
14:15	0	0	0	0		0	0	0	0	0	0	0
14:30	0	0	0	0		0	0	0	0	0	0	0
14:45	0	0	0	0		0	0	0	0	0	0	0
H/TOT	0	0	0	0		0	0	0	0	0	0	0
15:00	0	0	0	0		0	0	0	0	0	0	0
15:15	0	0	0	0		0	0	0	0	0	0	0
15:30	0	0	0	0		0	0	0	0	0	0	0
15:45	0	0	0	0		0	0	0	0	0	0	0
H/TOT	0	0	0	0		0	0	0	0	0	0	0
16:00	0	0	0	0		0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	1
17:15	0	0	0	0		0	0	0	0	0	0	0
17:30	0	0	0	0		0	0	0	0	0	0	0
17:45	0	0	0	0		0	0	0	0	0	0	0
H/TOT	0	0	0	0		0	0	0	0	0	0	1
18:00	0	0	0	0		0	0	0	0	0	0	0
18:15	0	0	0	0		0	0	0	0	0	0	0
18:30	0	0	0	0		0	0	0	0	0	0	1
18:45	0	0	0	0		0	0	0	0	0	0	0
H/TOT	0	0	0	0		0	0	0	0	0	0	1
12 TOT	#REF!	#REF!	#REF!	#REF!		#REF!	0	0	0	0	0	#REF!

elopment Office: Request for Quotations for Traffic Surveys in at 5 locations on the M4, M7 and N/M11

/ R772/ Southbound on-ramp to M11/ R772

			A => B											A => C
M/C	**CAR**	**TAXI**	**CARS**	**LGV**	**OGV1**	**OGV2**	**PSV**	**TOT**	**PCU**	**P/C**	**M/C**	**CAR**	**TAXI**	**CARS**
0	21	1		10	2	2	0	36	39.6	0	0	0	0	
0	34	0		9	1	2	0	46	49.1	0	0	0	0	
0	42	0		17	6	5	0	70	79.5	0	0	0	0	
0	60	0		9	4	1	0	74	77.3	0	0	0	0	
0	157	1		45	13	10	0	226	245.5	0	0	0	0	
1	54	0		17	1	2	0	75	77.5	0	0	0	0	
0	91	0	91	11	5	8	1	116	129.9	0	0	0	0	0
0	90	2	92	10	3	5	1	111	120	0	0	0	0	0
0	89	1	90	20	1	1	0	112	113.8	0	0	0	0	0
0	73	0	73	3	1	4	1	82	88.7	0	0	0	0	0
0	71	2		11	2	6	0	92	100.8	0	0	0	0	
0	56	1		11	3	3	3	77	85.4	0	0	0	0	
0	48	2		11	5	1	0	67	70.8	0	0	1	0	
0	248	5		36	11	14	4	318	345.7	0	0	1	0	
0	58	0		11	2	2	1	74	78.6	0	0	0	0	
0	44	0		10	5	0	1	60	63.5	0	0	0	0	
0	54	0		11	2	2	0	69	72.6	0	0	0	0	
0	55	1		13	1	4	1	75	81.7	0	0	0	0	
0	211	1		45	10	8	3	278	296.4	0	0	0	0	
0	49	1		11	2	2	1	66	70.6	0	0	0	0	
0	63	0		8	7	3	1	82	90.4	0	0	1	0	
1	57	1		18	2	2	1	82	86	0	0	0	0	
0	75	0		9	3	4	0	91	97.7	0	0	0	0	
1	244	2		46	14	11	3	321	344.7	0	0	1	0	
0	58	1		17	3	2	0	81	85.1	0	0	0	0	
0	54	0		17	9	1	0	81	86.8	0	0	0	0	
0	59	3		9	5	2	0	78	83.1	0	0	0	0	
0	79	3		16	2	5	0	105	112.5	0	0	0	0	
0	250	7		59	19	10	0	345	367.5	0	0	0	0	
0	69	0		8	1	3	0	81	85.4	0	0	0	0	
0	61	3		13	4	5	1	87	96.5	0	0	0	0	
0	70	1		5	3	4	0	83	89.7	0	0	0	0	
0	72	0		17	2	4	0	95	101.2	0	0	0	0	

0	272	4		43	10	16	1	346	372.8	0	0	0	0	
0	95	1		9	2	0	2	109	112	0	0	1	0	
0	69	0		12	3	2	2	88	94.1	0	0	1	0	
0	92	1		14	5	3	0	115	121.4	0	0	0	0	
0	79	0		11	2	5	0	97	104.5	0	0	0	0	
0	335	2		46	12	10	4	409	432	0	0	2	0	
0	92	0		13	4	3	1	113	119.9	0	0	1	0	
0	75	2		14	2	8	1	102	114.4	0	0	0	0	
0	87	3		17	4	4	1	116	124.2	0	0	0	0	
0	104	2		22	2	2	1	133	137.6	0	0	0	0	
0	358	7		66	12	17	4	464	496.1	0	0	1	0	
1	99	1		21	4	3	2	131	138.3	0	0	0	0	
1	131	2	133	22	2	6	0	164	172.2	0	0	4	0	4
2	96	1	97	34	3	2	2	140	144.9	0	0	0	0	0
0	101	1	102	24	1	3	0	130	134.4	0	0	1	0	1
0	121	1	122	17	5	2	0	147	151.3	0	0	0	0	0
0	116	0		23	2	1	1	143	146.3	0	0	0	0	
0	134	0		17	2	0	0	153	154	0	0	1	0	
1	107	0		18	1	2	0	129	131.5	0	0	0	0	
1	478	1		75	10	5	1	572	583.1	0	0	1	0	
1	116	1		16	1	1	0	136	137.2	0	0	0	0	
0	121	0		18	1	1	0	141	142.8	0	0	0	0	
1	148	0		13	1	2	1	167	169.7	0	0	0	0	
1	109	1		17	1	0	1	130	130.9	0	0	0	0	
3	494	2		64	4	4	2	574	580.6	0	0	0	0	
#REF!	#REF!	#REF!		#REF!	135	135	28	4832	5095.4	#REF!	#REF!	#REF!	#REF!	

										A => D				
LGV	**OGV1**	**OGV2**	**PSV**	**TOT**	**PCU**	**P/C**	**M/C**	**CAR**	**TAXI**	**CARS**	**LGV**	**OGV1**	**OGV2**	**PSV**
0	0	0	0	0	0	0	0	2	0		0	0	0	0
0	0	0	0	0	0	0	0	5	0		1	0	0	0
1	0	0	0	1	1	0	0	1	0		4	0	0	0
0	0	0	0	0	0	0	0	3	0		0	1	0	0
1	0	0	0	1	1	0	0	11	0		5	1	0	0
0	0	0	0	0	0	0	0	2	0		0	0	0	0
0	0	0	0	0	0	0	0	3	0	3	1	0	0	0
0	0	0	0	0	0	0	0	6	0	6	1	0	0	0
0	0	0	0	0	0	0	0	3	0	3	1	1	0	0
0	0	0	0	0	0	0	0	2	0	2	1	0	1	0
0	0	0	0	0	0	0	0	2	0		1	0	1	0
0	0	0	0	0	0	0	0	5	0		1	2	0	0
0	0	0	0	1	1	0	0	4	0		0	0	0	0
0	0	0	0	1	1	0	0	13	0		3	2	2	0
0	0	0	0	0	0	0	0	3	0		2	1	0	0
0	0	0	0	0	0	0	0	5	0		0	1	0	0
0	0	0	0	0	0	0	0	1	0		0	0	0	0
0	0	0	0	0	0	0	0	4	0		1	0	0	0
0	0	0	0	0	0	0	0	13	0		3	2	0	0
0	0	0	0	0	0	0	0	2	0		0	0	0	0
0	0	0	0	1	1	0	0	5	0		1	0	0	0
0	0	0	0	0	0	0	0	4	0		0	1	0	0
0	0	0	0	0	0	0	0	7	0		1	0	0	0
0	0	0	0	1	1	0	0	18	0		2	1	0	0
0	0	0	0	0	0	0	0	3	1		3	0	0	1
0	0	0	0	0	0	0	0	2	0		1	0	0	0
0	0	0	0	0	0	0	0	2	0		0	0	0	0
0	0	0	0	0	0	0	0	6	0		0	0	0	0
0	0	0	0	0	0	0	0	13	1		4	0	0	1
0	0	0	0	0	0	0	0	2	0		0	0	0	0
0	0	0	0	0	0	0	0	5	0		1	0	0	0
0	0	0	0	0	0	0	0	7	0		2	0	0	0
0	0	0	0	0	0	0	0	3	0		0	2	1	0

0	0	0	0	0	0	0	0	17	0		3	2	1	0
0	0	0	0	1	1	0	0	2	0		0	1	0	0
0	0	0	0	1	1	0	0	3	0		2	0	0	0
0	0	0	0	0	0	0	0	4	0		0	0	0	0
0	0	0	0	0	0	0	0	1	0		0	0	0	0
0	0	0	0	2	2	0	0	10	0		2	1	0	0
0	0	0	0	1	1	0	0	9	0		2	0	0	0
0	0	0	0	0	0	0	0	10	1		1	0	0	0
0	0	0	0	0	0	0	0	6	1		1	0	2	0
0	0	0	0	0	0	0	0	8	0		0	0	0	0
0	0	0	0	1	1	0	0	33	2		4	0	2	0
0	0	0	0	0	0	0	0	9	0		0	0	0	0
0	0	0	0	4	4	0	0	13	0	13	8	0	0	0
0	0	0	0	0	0	0	0	9	0	9	4	0	0	0
0	0	0	0	1	1	0	0	18	0	18	5	0	0	0
0	0	0	0	0	0	0	0	10	0	10	4	0	0	0
0	0	0	0	0	0	0	0	13	0		3	0	0	0
0	0	0	0	1	1	0	0	13	0		1	0	0	0
0	0	0	0	0	0	0	0	11	0		6	0	0	0
0	0	0	0	1	1	0	0	47	0		14	0	0	0
0	0	0	0	0	0	0	0	14	0		0	0	0	0
0	0	0	0	0	0	0	0	9	0		2	0	0	0
0	0	0	0	0	0	0	0	9	0		2	0	0	0
0	0	0	0	0	0	0	0	9	0		2	0	0	0
0	0	0	0	0	0	0	0	41	0		6	0	0	0
#REF!	0	0	0	12	12	#REF!	#REF!	#REF!	#REF!		#REF!	10	5	1

						B => A								
TOT	PCU	P/C	M/C	CAR	TAXI	CARS	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C
2	2	0	0	0	0		0	0	0	0	0	0	0	0
6	6	0	0	0	0		0	0	0	0	0	0	0	0
5	5	0	0	0	0		0	0	0	0	0	0	0	0
4	4.5	0	0	0	0		0	0	0	0	0	0	0	0
17	17.5	0	0	0	0		0	0	0	0	0	0	0	0
2	2	0	0	0	0		0	0	0	0	0	0	0	0
4	4	0	0	0	0	0	0	0	0	0	0	0	0	0
7	7	0	0	0	0	0	0	0	0	0	0	0	0	0
5	5.5	0	0	0	0	0	0	0	0	0	0	0	0	0
4	5.3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	5.3	0	0	0	0		0	0	0	0	0	0	0	0
8	9	0	0	0	0		0	0	0	0	0	0	0	0
4	4	0	0	0	0		0	0	0	0	0	0	0	0
20	23.6	0	0	0	0		0	0	0	0	0	0	0	0
6	6.5	0	0	0	0		0	0	0	0	0	0	0	0
6	6.5	0	0	0	0		0	0	0	0	0	0	0	0
1	1	0	0	0	0		0	0	0	0	0	0	0	0
5	5	0	0	0	0		0	0	0	0	0	0	0	0
18	19	0	0	0	0		0	0	0	0	0	0	0	0
2	2	0	0	0	0		0	0	0	0	0	0	0	0
6	6	0	0	0	0		0	0	0	0	0	0	0	0
5	5.5	0	0	0	0		0	0	0	0	0	0	0	0
8	8	0	0	0	0		0	0	0	0	0	0	0	0
21	21.5	0	0	0	0		0	0	0	0	0	0	0	0
8	9	0	0	0	0		0	0	0	0	0	0	0	0
3	3	0	0	0	0		0	0	0	0	0	0	0	0
2	2	0	0	0	0		0	0	0	0	0	0	0	0
6	6	0	0	0	0		0	0	0	0	0	0	0	0
19	20	0	0	0	0		0	0	0	0	0	0	0	0
2	2	0	0	0	0		0	0	0	0	0	0	0	0
6	6	0	0	0	0		0	0	0	0	0	0	0	0
9	9	0	0	0	0		0	0	0	0	0	0	0	0
6	8.3	0	0	0	0		0	0	0	0	0	0	0	0

23	25.3	0	0	0	0		0	0	0	0	0	0	0	0
3	3.5	0	0	0	0		0	0	0	0	0	0	0	0
5	5	0	0	0	0		0	0	0	0	0	0	0	0
4	4	0	0	0	0		0	0	0	0	0	0	0	0
1	1	0	0	0	0		0	0	0	0	0	0	0	0
13	13.5	0	0	0	0		0	0	0	0	0	0	0	0
11	11	0	0	0	0		0	0	0	0	0	0	0	0
12	12	0	0	0	0		0	0	0	0	0	0	0	0
10	12.6	0	0	0	0		0	0	0	0	0	0	0	0
8	8	0	0	0	0		0	0	0	0	0	0	0	0
41	43.6	0	0	0	0		0	0	0	0	0	0	0	0
9	9	0	0	0	0		0	0	0	0	0	0	0	0
21	21	0	0	0	0	0	0	0	0	0	0	0	0	0
13	13	0	0	0	0	0	0	0	0	0	0	0	0	0
23	23	0	0	0	0	0	0	0	0	0	0	0	0	0
14	14	0	0	0	0	0	0	0	0	0	0	0	0	0
16	16	0	0	0	0		0	0	0	0	0	0	0	0
14	14	0	0	0	0		0	0	0	0	0	0	0	0
17	17	0	0	0	0		0	0	0	0	0	0	0	0
61	61	0	0	0	0		0	0	0	0	0	0	0	0
14	14	0	0	0	0		0	0	0	0	0	0	0	0
11	11	0	0	0	0		0	0	0	0	0	0	0	0
11	11	0	0	0	0		0	0	0	0	0	0	0	0
11	11	0	0	0	0		0	0	0	0	0	0	0	0
47	47	0	0	0	0		0	0	0	0	0	0	0	0
364	376.5	#REF!	#REF!	#REF!	#REF!		#REF!	0	0	0	0	0	#REF!	#REF!

		B => B											B => C	
CAR	TAXI	CARS	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	TAXI	CARS	LGV
0	0		0	0	0	0	0	0	0	0	0	0		4
0	0		0	0	0	0	0	0	0	0	1	0		0
0	0		0	0	0	0	0	0	0	0	2	0		0
0	0		0	0	0	0	0	0	0	0	1	0		3
0	0		0	0	0	0	0	0	0	0	4	0		7
0	0		0	0	0	0	0	0	0	0	1	0		0
1	0	1	0	0	0	0	1	1	0	0	3	0	3	0
0	0	0	0	0	0	0	0	0	0	0	7	0	7	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
0	1		1	0	0	0	2	2	0	0	2	0		0
1	1		1	0	0	0	3	3	0	0	1	0		1
0	0		0	0	0	0	0	0	0	0	5	0		0
1	2		2	0	0	0	5	5	0	0	10	0		3
0	0		0	0	0	0	0	0	0	0	1	0		1
0	0		0	0	0	0	0	0	0	0	2	0		2
1	0		1	0	0	0	2	2	0	0	0	0		0
1	0		0	0	0	0	1	1	0	0	1	0		0
2	0		1	0	0	0	3	3	0	0	4	0		3
3	0		0	0	0	0	3	3	0	0	2	0		0
0	0		0	0	0	0	0	0	0	0	5	0		0
0	0		1	0	0	0	1	1	0	0	2	0		1
0	0		0	0	0	0	0	0	0	0	5	0		2
3	0		1	0	0	0	4	4	0	0	14	0		3
0	0		1	0	0	0	1	1	0	0	8	0		4
1	0		0	0	0	0	1	1	0	0	5	0		2
1	0		0	0	0	0	1	1	0	0	5	0		2
0	0		0	0	0	0	0	0	0	0	6	0		4
2	0		1	0	0	0	3	3	0	0	24	0		12
0	0		0	0	0	0	0	0	0	0	3	0		2
1	0		0	0	0	0	1	1	0	0	5	0		2
0	0		0	0	0	0	0	0	0	0	6	0		3
1	0		0	0	0	0	1	1	0	0	9	0		0

2	0		0	0	0	0	2	2	0	0	23	0		7
1	0		0	0	0	0	1	1	0	0	4	0		3
1	0		0	0	0	0	1	1	0	0	7	0		1
1	0		0	0	0	0	1	1	0	0	5	0		1
1	0		0	0	0	0	1	1	0	0	4	0		0
4	0		0	0	0	0	4	4	0	0	20	0		5
0	0		1	0	0	0	1	1	0	0	6	0		1
0	0		0	0	0	0	0	0	0	0	5	0		2
1	0		0	0	0	0	1	1	0	0	6	0		0
0	0		0	0	0	0	0	0	0	0	5	0		2
1	0		1	0	0	0	2	2	0	0	22	0		5
0	0		0	0	0	0	0	0	0	0	10	0		4
2	0	2	0	0	0	0	2	2	2	0	9	0	9	2
0	0	0	0	0	0	0	0	0	0	0	13	0	13	1
0	0	0	0	0	0	0	0	0	0	0	6	0	6	5
0	0	0	0	0	0	0	0	0	0	0	18	0	18	7
0	0		1	1	0	0	2	2.5	0	0	6	0		0
1	0		0	0	0	0	1	1	0	0	14	0		2
0	0		0	0	0	0	0	0	0	0	6	0		2
1	0		1	1	0	0	3	3.5	0	0	44	0		11
1	0		0	0	0	0	1	1	0	0	7	0		1
0	0		0	0	0	0	0	0	0	0	10	0		0
1	0		0	0	0	0	1	1	0	0	3	0		1
1	0		0	0	0	0	1	1	0	0	3	0		2
3	0		0	0	0	0	3	3	0	0	23	0		4
#REF!	#REF!		#REF!	1	0	0	32	32.5	#REF!	#REF!	#REF!	#REF!		#REF!

									B => D					
OGV1	**OGV2**	**PSV**	**TOT**	**PCU**	**P/C**	**M/C**	**CAR**	**TAXI**	**CARS**	**LGV**	**OGV1**	**OGV2**	**PSV**	**TOT**
0	1	0	5	6.3	0	1	182	0		40	4	3	0	230
1	0	0	2	2.5	0	0	146	0		39	6	2	2	195
0	0	0	2	2	0	0	154	0		24	4	3	1	186
0	0	0	4	4	0	2	150	0		25	5	3	4	189
1	1	0	13	14.8	0	3	632	0		128	19	11	7	800
0	0	0	1	1	0	1	121	0		27	13	3	2	167
1	1	0	5	6.8	0	0	152	1	153	29	7	6	3	198
0	2	0	9	11.6	0	1	172	3	175	24	2	5	1	208
0	0	0	1	1	1	1	159	2	161	21	10	1	0	195
0	1	0	5	6.3	0	0	167	1	168	14	6	2	1	191
1	0	0	3	3.5	1	0	141	3		24	1	4	2	176
1	1	0	4	5.8	0	0	123	0		24	5	2	1	155
1	0	0	6	6.5	0	0	112	1		20	4	5	0	142
3	2	0	18	22.1	1	0	543	5		82	16	13	4	664
2	0	0	4	5	1	0	114	0		16	1	6	0	138
1	0	0	5	5.5	1	1	89	3		20	7	3	1	125
0	0	0	0	0	0	0	106	3		17	7	1	1	135
0	0	0	1	1	0	0	81	1		19	1	1	3	106
3	0	0	10	11.5	2	1	390	7		72	16	11	5	504
0	1	1	4	6.3	1	2	95	2		21	5	1	0	127
0	0	0	5	5	1	1	108	2		14	4	2	2	134
0	0	0	3	3	3	1	101	1		14	4	2	0	126
2	1	1	11	14.3	1	0	91	1		17	4	2	1	117
2	2	2	23	28.6	6	4	395	6		66	17	7	3	504
0	1	0	13	14.3	1	0	107	0		16	1	3	0	128
0	1	0	8	9.3	0	0	117	3		18	1	1	1	141
0	0	0	7	7	1	0	116	4		16	2	1	1	141
0	1	0	11	12.3	1	1	143	1		12	5	2	1	166
0	3	0	39	42.9	3	1	483	8		62	9	7	3	576
1	0	0	6	6.5	1	0	114	0		16	4	2	1	138
3	0	0	10	11.5	0	1	140	1		10	5	4	1	162
0	0	0	9	9	0	1	114	3		11	6	5	1	141
2	1	0	12	14.3	1	1	119	1		13	3	1	2	141

6	1	0	37	41.3	2	3	487	5		50	18	12	5	582
0	4	0	11	16.2	0	0	115	2		13	2	5	0	137
1	0	0	9	9.5	0	0	112	0		9	4	7	3	135
0	1	0	7	8.3	0	1	123	0		14	8	1	2	149
0	0	0	4	4	0	1	129	3		13	4	1	0	151
1	5	0	31	38	0	2	479	5		49	18	14	5	572
0	0	0	7	7	0	1	101	1		18	4	5	1	131
0	1	0	8	9.3	0	0	108	0		14	4	3	2	131
0	0	0	6	6	0	1	124	0		11	1	1	1	139
0	1	0	8	9.3	0	0	139	1		17	3	1	0	161
0	2	0	29	31.6	0	2	472	2		60	12	10	4	562
0	0	0	14	14	0	0	154	5		13	1	0	1	174
1	0	0	14	12.9	2	0	145	2	147	17	1	6	6	179
0	2	0	16	18.6	1	0	147	3	150	21	5	1	3	181
0	0	0	11	11	0	0	140	3	143	22	2	1	1	169
0	0	0	25	25	0	2	128	2	130	17	3	2	0	154
0	0	0	6	6	1	0	128	0		15	1	1	1	147
0	0	0	16	16	0	0	159	1		12	3	0	1	176
0	0	0	8	8	0	0	119	0		11	4	0	0	134
0	0	0	55	55	1	2	534	3		55	11	3	2	611
0	2	0	10	12.6	2	0	130	1		10	2	0	1	146
0	0	0	10	10	1	0	120	1		6	0	1	1	130
0	0	0	4	4	0	0	95	0		10	1	1	1	108
1	0	0	6	6.5	0	0	80	0		7	0	0	0	87
1	2	0	30	33.1	3	0	425	2		33	3	2	3	471
19	23	2	356	395.8	#REF!	#REF!	#REF!	#REF!		#REF!	180	113	58	7317

					C => A									
PCU	P/C	M/C	CAR	TAXI	CARS	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR
235.3	0	0	0	0		0	0	0	0	0	0	0	0	0
202.6	0	0	0	0		0	0	0	0	0	0	0	0	0
192.9	0	0	0	0		0	0	0	0	0	0	0	0	0
198.2	0	0	0	0		0	0	0	0	0	0	0	0	0
829	0	0	0	0		0	0	0	0	0	0	0	0	0
178.8	0	0	0	0		0	0	0	0	0	0	0	0	0
212.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
215.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0
199.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0
197.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
182.9	0	0	0	0		0	0	0	0	0	0	0	0	0
161.1	0	0	0	0		0	0	0	0	0	0	0	0	0
150.5	0	0	0	0		0	0	0	0	0	0	0	0	0
692.1	0	0	0	0		0	0	0	0	0	0	0	0	0
145.5	0	0	0	0		0	0	0	0	0	0	0	0	0
132	0	0	0	0		0	0	0	0	0	0	0	0	0
140.8	0	0	0	0		0	0	0	0	0	0	0	0	0
110.8	0	0	0	0		0	0	0	0	0	0	0	0	0
529.1	0	0	0	0		0	0	0	0	0	0	0	0	0
128.8	0	0	0	0		0	0	0	0	0	0	0	0	0
139.2	0	0	0	0		0	0	0	0	0	0	0	0	0
127.6	0	0	0	0		0	0	0	0	0	0	0	0	0
121.8	0	0	0	0		0	0	0	0	0	0	0	0	0
517.4	0	0	0	0		0	0	0	0	0	0	0	0	0
131.6	0	0	0	0		0	0	0	0	0	0	0	0	0
143.8	0	0	0	0		0	0	0	0	0	0	0	0	0
143.5	0	0	0	0		0	0	0	0	0	0	0	0	0
170.7	0	0	0	0		0	0	0	0	0	0	0	0	0
589.6	0	0	0	0		0	0	0	0	0	0	0	0	0
142.8	0	0	0	0		0	0	0	0	0	0	0	0	0
170.1	0	0	0	0		0	0	0	0	0	0	0	0	0
150.9	0	0	0	0		0	0	0	0	0	0	0	0	0
144.4	0	0	0	0		0	0	0	0	0	0	0	0	0

608.2	0	0	0	0		0	0	0	0	0	0	0	0	0
144.5	0	0	0	0		0	0	0	0	0	0	0	0	0
149.1	0	0	0	0		0	0	0	0	0	0	0	0	0
155.7	0	0	0	0		0	0	0	0	0	0	0	0	0
153.7	0	0	0	0		0	0	0	0	0	0	0	0	0
603	0	0	0	0		0	0	0	0	0	0	0	0	0
139.9	0	0	0	0		0	0	0	0	0	0	0	0	0
138.9	0	0	0	0		0	0	0	0	0	0	0	0	0
141.2	0	0	0	0		0	0	0	0	0	0	0	0	0
163.8	0	0	0	0		0	0	0	0	0	0	0	0	0
583.8	0	0	0	0		0	0	0	0	0	0	0	0	0
175.5	0	0	0	0		0	0	0	0	0	0	0	0	0
191.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0
187	0	0	0	0	0	0	0	0	0	0	0	0	0	0
172.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
156.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0
149	0	0	0	0		0	0	0	0	0	0	0	0	0
178.5	0	0	0	0		0	0	0	0	0	0	0	0	0
136	0	0	0	0		0	0	0	0	0	0	0	0	0
620.4	0	0	0	0		0	0	0	0	0	0	0	0	0
146.4	0	0	0	0		0	0	0	0	0	0	0	0	0
131.5	0	0	0	0		0	0	0	0	0	0	0	0	0
110.8	0	0	0	0		0	0	0	0	0	0	0	0	0
87	0	0	0	0		0	0	0	0	0	0	0	0	0
475.7	0	0	0	0		0	0	0	0	0	0	0	0	0
7581.7	#REF!	#REF!	#REF!	#REF!		#REF!	0	0	0	0	0	#REF!	#REF!	#REF!

	C => B											C => C		
TAXI	**CARS**	**LGV**	**OGV1**	**OGV2**	**PSV**	**TOT**	**PCU**	**P/C**	**M/C**	**CAR**	**TAXI**	**CARS**	**LGV**	**OGV1**
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0

0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
0		0	0	0	0	0	0	0	0	0	0		0	0
#REF!		#REF!	0	0	0	0	0	#REF!	#REF!	#REF!	#REF!		#REF!	0

				C => D										
OGV2	**PSV**	**TOT**	**PCU**	**P/C**	**M/C**	**CAR**	**TAXI**	**CARS**	**LGV**	**OGV1**	**OGV2**	**PSV**	**TOT**	**PCU**
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0

0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	0	0	0	#REF!	#REF!	#REF!	#REF!		#REF!	0	0	0	0	0

D => A														
P/C	M/C	CAR	TAXI	CARS	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	TAXI
0	0	0	0		0	0	0	0	0	0	0	0	14	0
0	0	0	0		0	0	0	0	0	0	0	0	18	0
0	0	0	0		0	0	0	0	0	0	0	0	26	0
0	0	0	0		0	0	0	0	0	0	0	0	33	2
0	0	0	0		0	0	0	0	0	0	0	0	91	2
0	0	0	0		0	0	0	0	0	0	0	0	37	0
0	0	0	0	0	0	0	0	0	0	0	0	1	58	0
0	0	0	0	0	0	0	0	0	0	0	0	0	60	1
0	0	0	0	0	0	0	0	0	0	0	0	0	60	0
0	0	0	0	0	0	0	0	0	0	0	0	0	77	1
0	0	0	0		0	0	0	0	0	0	0	1	89	0
0	0	0	0		0	0	0	0	0	0	0	0	39	1
0	0	0	0		0	0	0	0	0	0	0	0	58	0
0	0	0	0		0	0	0	0	0	0	0	1	263	2
0	0	0	0		0	0	0	0	0	0	0	0	29	0
0	0	0	0		0	0	0	0	0	0	0	0	38	1
0	0	0	0		0	0	0	0	0	0	1	1	43	0
0	0	0	0		0	0	0	0	0	0	0	0	43	2
0	0	0	0		0	0	0	0	0	0	1	1	153	3
0	0	0	0		0	0	0	0	0	0	0	0	36	0
0	0	0	0		0	0	0	0	0	0	2	1	49	1
0	0	0	0		0	0	0	0	0	0	1	0	47	0
0	0	0	0		0	0	0	0	0	0	1	1	47	0
0	0	0	0		0	0	0	0	0	0	4	2	179	1
0	0	0	0		0	0	0	0	0	0	0	0	45	0
1	0	0	0		0	0	0	0	1	0.2	0	0	57	0
0	0	0	0		0	0	0	0	0	0	0	1	40	0
0	0	0	0		0	0	0	0	0	0	0	0	40	1
1	0	0	0		0	0	0	0	1	0.2	0	1	182	1
0	0	0	0		0	0	0	0	0	0	0	0	58	0
0	0	0	0		0	0	0	0	0	0	1	0	43	0
0	0	0	0		0	0	0	0	0	0	0	0	39	0
0	0	0	0		0	0	0	0	0	0	0	2	68	0

0	0	0	0		0	0	0	0	0	0	1	2	208	0
0	0	0	0		0	0	0	0	0	0	0	0	53	0
0	0	0	0		0	0	0	0	0	0	1	2	50	0
0	0	0	0		0	0	0	0	0	0	0	0	73	0
0	0	0	0		0	0	0	0	0	0	0	1	43	0
0	0	0	0		0	0	0	0	0	0	1	3	219	0
0	0	0	0		0	0	0	0	0	0	0	0	99	4
0	0	0	0		0	0	0	0	0	0	0	0	57	1
0	0	0	0		0	0	0	0	0	0	0	0	55	0
0	0	0	0		0	0	0	0	0	0	0	0	50	0
0	0	0	0		0	0	0	0	0	0	0	0	261	5
0	0	0	0		0	0	0	0	0	0	0	0	36	1
0	0	0	0	0	0	0	0	0	0	0	1	0	38	0
0	0	0	0	0	0	0	0	0	0	0	0	0	51	1
0	0	0	0	0	0	0	0	0	0	0	0	0	46	1
0	0	0	0	0	0	0	0	0	0	0	2	1	43	1
0	0	0	0		0	0	0	0	0	0	0	0	57	0
0	0	0	0		0	0	0	0	0	0	1	1	47	0
0	0	0	0		0	0	0	0	0	0	0	0	40	0
0	0	0	0		0	0	0	0	0	0	3	2	187	1
0	0	0	0		0	0	0	0	0	0	0	0	35	0
0	0	0	0		0	0	0	0	0	0	2	0	40	0
0	0	0	0		0	0	0	0	0	0	2	0	48	0
0	0	0	0		0	0	0	0	0	0	0	0	41	0
0	0	0	0		0	0	0	0	0	0	4	0	164	0
#REF!	#REF!	#REF!	#REF!		#REF!	0	0	0	1	0.2	#REF!	#REF!	#REF!	#REF!

D => B											D => C			
CARS	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	TAXI	CARS	LGV	OGV1	OGV2
	9	2	0	1	26	28	0	0	0	0		1	0	0
	6	0	0	1	25	26	0	0	4	0		0	0	0
	12	1	0	0	39	39.5	0	0	4	0		4	0	1
	10	7	1	1	54	59.8	0	0	11	0		2	0	0
	37	10	1	3	144	153.3	0	0	19	0		7	0	1
	4	1	1	2	45	48.8	0	0	12	0		2	0	0
58	2	1	1	2	65	68.2	0	0	12	0	12	2	0	2
61	7	2	0	0	70	71	0	0	14	0	14	3	1	1
60	3	1	1	1	66	68.8	0	0	8	0	8	2	0	1
78	6	3	0	0	87	88.5	0	0	11	0	11	1	1	1
	7	2	2	1	102	106	0	0	15	0		3	1	0
	2	1	1	1	45	47.8	0	0	10	0		1	0	1
	7	2	0	0	67	68	0	0	9	0		1	0	0
	22	8	3	2	301	310.3	0	0	45	0		6	2	2
	5	1	0	0	35	35.5	0	0	5	0		2	0	0
	3	0	0	1	43	44	0	0	7	0		0	0	1
	2	0	1	0	48	47.9	0	0	8	0		2	1	1
	5	1	0	1	52	53.5	0	0	14	0		3	2	1
	15	2	1	2	178	180.9	0	0	34	0		7	3	3
	3	1	2	0	42	45.1	0	0	1	0		0	1	0
	3	1	1	1	59	59.6	0	0	8	0		1	0	1
	6	0	0	0	54	53.2	0	0	7	0		5	2	0
	2	2	1	0	54	54.9	0	0	7	0		2	0	0
	14	4	4	1	209	212.8	0	0	23	0		8	3	1
	13	2	1	0	61	63.3	0	0	9	0		1	0	3
	3	1	0	1	62	63.5	0	0	8	0		2	0	0
	8	0	0	1	50	50.4	0	0	4	0		0	1	1
	5	1	0	0	47	47.5	0	0	8	0		1	1	0
	29	4	1	2	220	224.7	0	0	29	0		4	2	4
	4	1	2	0	65	68.1	0	0	8	0		1	0	0
	4	2	2	0	52	54.8	0	0	9	0		0	1	0
	0	1	1	1	42	44.8	0	0	7	0		2	0	2
	6	3	0	0	79	79.3	0	0	10	0		1	1	0

	14	7	5	1	238	247	0	0	34	0		4	2	2
	6	1	0	2	62	64.5	0	0	15	0		2	0	0
	2	0	1	1	57	57.3	0	0	9	0		1	0	1
	5	1	0	0	79	79.5	0	0	14	0		3	0	1
	6	1	0	0	51	50.9	0	0	9	0		2	1	0
	19	3	1	3	249	252.2	0	0	47	0		8	1	2
	6	0	1	0	110	111.3	0	0	17	0		2	0	1
	8	2	0	0	68	69	0	0	15	0		5	0	0
	1	2	2	2	62	67.6	0	1	13	0		1	0	0
	6	1	0	0	57	57.5	0	0	15	0		5	0	0
	21	5	3	2	297	305.4	0	1	60	0		13	0	1
	9	1	0	1	48	49.5	0	0	17	0		2	1	0
38	9	4	2	1	55	59.8	0	0	24	0	24	6	0	0
52	4	1	2	2	61	66.1	0	0	25	0	25	6	0	0
47	4	2	0	1	54	56	0	0	16	0	16	5	0	0
44	4	3	1	0	55	55.6	0	0	32	1	33	4	0	1
	1	0	2	0	60	62.6	0	0	15	0		3	1	0
	6	0	0	3	58	59.6	0	0	20	0		0	0	0
	4	1	1	2	48	51.8	0	0	8	0		4	0	0
	15	4	4	5	221	229.6	0	0	75	1		11	1	1
	3	0	0	1	39	40	0	0	12	0		3	0	0
	3	0	0	0	45	43.4	0	0	9	0		3	0	0
	2	1	0	3	56	57.9	0	0	16	0		3	0	0
	2	2	0	1	46	48	0	0	11	0		0	0	0
	10	3	0	5	186	189.3	0	0	48	0		9	0	0
	#REF!	63	30	36	2707	2793.7	#REF!	#REF!	#REF!	#REF!		#REF!	16	21

							D => D						
PSV	TOT	PCU	P/C	M/C	CAR	TAXI	CARS	LGV	OGV1	OGV2	PSV	TOT	PCU
0	1	1	0	0	0	0		0	0	0	0	0	0
0	4	4	0	0	0	0		0	0	0	0	0	0
0	9	10.3	0	0	0	0		0	0	0	0	0	0
0	13	13	0	0	0	0		0	0	0	0	0	0
0	27	28.3	0	0	0	0		0	0	0	0	0	0
0	14	14	0	0	0	0		0	0	0	0	0	0
0	16	18.6	0	0	0	0	0	0	0	0	0	0	0
0	19	20.8	0	0	0	0	0	0	0	0	0	0	0
0	11	12.3	0	0	0	0	0	0	0	0	0	0	0
0	14	15.8	0	0	0	0	0	0	0	0	0	0	0
0	19	19.5	0	0	1	0		0	0	0	0	1	1
0	12	13.3	0	0	0	0		0	0	0	0	0	0
0	10	10	0	0	0	0		0	0	0	0	0	0
0	55	58.6	0	0	1	0		0	0	0	0	1	1
0	7	7	0	0	0	0		0	0	0	0	0	0
0	8	9.3	0	0	0	0		0	0	0	0	0	0
0	12	13.8	0	0	0	0		0	0	0	0	0	0
0	20	22.3	0	0	0	0		0	0	0	0	0	0
0	47	52.4	0	0	0	0		0	0	0	0	0	0
0	2	2.5	0	0	0	0		0	0	0	0	0	0
0	10	11.3	0	0	0	0		0	0	0	0	0	0
0	14	15	0	0	0	0		0	0	0	0	0	0
0	9	9	0	0	0	0		0	0	0	0	0	0
0	35	37.8	0	0	0	0		0	0	0	0	0	0
0	13	16.9	0	0	0	0		0	0	0	0	0	0
0	10	10	0	0	0	0		0	0	0	0	0	0
0	6	7.8	0	0	1	0		0	0	0	0	1	1
0	10	10.5	0	0	2	0		0	0	0	0	2	2
0	39	45.2	0	0	3	0		0	0	0	0	3	3
0	9	9	0	0	0	0		0	0	0	0	0	0
0	10	10.5	0	0	0	0		0	0	0	0	0	0
0	11	13.6	0	0	1	0		0	0	0	0	1	1
0	12	12.5	0	0	0	0		0	0	0	0	0	0

0	42	45.6	0	0	1	0		0	0	0	0	1	1
1	18	19	0	0	0	0		0	0	0	0	0	0
0	11	12.3	0	0	1	0		0	0	0	0	1	1
0	18	19.3	0	0	0	0		0	0	0	0	0	0
0	12	12.5	0	0	1	0		0	0	0	0	1	1
1	59	63.1	0	0	2	0		0	0	0	0	2	2
0	20	21.3	0	0	0	0		0	0	0	0	0	0
0	20	20	0	0	0	0		0	0	0	0	0	0
0	15	14.4	0	0	0	0		0	0	0	0	0	0
0	20	20	0	0	0	0		0	0	0	0	0	0
0	75	75.7	0	0	0	0		0	0	0	0	0	0
0	20	20.5	0	0	1	0		0	0	0	0	1	1
0	30	30	0	0	0	0	0	0	0	0	0	0	0
0	31	31	0	0	0	0	0	0	0	0	0	0	0
0	21	21	0	0	0	0	0	0	0	0	0	0	0
0	38	39.3	0	0	0	0	0	0	0	0	0	0	0
0	19	19.5	0	0	0	0		0	0	0	0	0	0
0	20	20	0	0	0	0		1	0	0	0	1	1
0	12	12	0	0	0	0		0	0	0	0	0	0
0	89	90.8	0	0	0	0		1	0	0	0	1	1
0	15	15	0	0	1	0		0	0	0	0	1	1
0	12	12	0	0	0	0		0	0	0	0	0	0
0	19	19	0	0	0	0		0	0	0	0	0	0
0	11	11	0	0	0	0		0	0	0	0	0	0
0	57	57	0	0	1	0		0	0	0	0	1	1
1	687	722.7	#REF!	#REF!	#REF!	#REF!		#REF!	0	0	0	10	10

TIME		One hour	AM	PM
07:00	312.2	1289.4	1690.6	1815
07:15	290.2	1299.3	08:15	16:15
07:30	330.2	1449.9		
07:45	356.8	1566		
08:00	322.1	1610.5		
08:15	440.8	1690.6		
08:30	446.3	1670.8		
08:45	401.3	1549.9		
09:00	402.2	1459.4		
09:15	421	1335.3		
09:30	325.4	1175.1		
09:45	310.8	1127.8		
10:00	278.1	1092.3		
10:15	260.8	1072.5		
10:30	278.1	1124.2		
10:45	275.3	1137.4		
11:00	258.3	1167.8		
11:15	312.5	1230.7		
11:30	291.3	1235.8		
11:45	305.7	1240.3		
12:00	321.2	1296.1		
12:15	317.6	1288.7		
12:30	295.8	1321.5		
12:45	361.5	1343.7		
13:00	313.8	1343.2		
13:15	350.4	1391.1		
13:30	318	1371		
13:45	361	1442.2		

14:00	361.7	1409.8
14:15	330.3	1460.5
14:30	389.2	1493.8
14:45	328.6	1471.6
15:00	412.4	1539.2
15:15	363.6	1534.6
15:30	367	1664.6
15:45	396.2	1758.2
16:00	407.8	1780.7
16:15	493.6	1815
16:30	460.6	1723.3
16:45	418.7	1707.8
17:00	442.1	1645.4
17:15	401.9	1570.5
17:30	445.1	1519.3
17:45	356.3	1447.6
18:00	367.2	1386.7
18:15	350.7	
18:30	373.4	
18:45	295.4	
12 TOT	17020.5	

Appendix B: Traffic Modelling Results

Junctions 10

ARCADY 10 - Roundabout Module

Filename: J16 Eastern Roundabout.j10
Path: Q:\2020 Jobs\20_008L Ashford Rathnew\Traffic Study\Junction 16
Report generation date: 25/07/2023 11:03:52

Summary of junction performance

	AM					PM				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
	2022									
1 - N11 North	D1	0.5	3.59	0.33	A	D2	0.9	4.38	0.47	A
2 - R772 East		2.1	8.01	0.66	A		1.8	7.64	0.63	A
4 - R772 West		0.4	3.59	0.28	A		0.4	3.59	0.27	A
	2025									
1 - N11 North	D3	0.5	3.65	0.33	A	D4	0.9	4.46	0.47	A
2 - R772 East		2.2	8.36	0.68	A		1.9	7.95	0.65	A
4 - R772 West		0.4	3.65	0.29	A		0.4	3.62	0.28	A
	2030									
1 - N11 North	D5	0.5	3.65	0.33	A	D6	0.9	4.46	0.47	A
2 - R772 East		2.2	8.36	0.68	A		1.9	7.95	0.65	A
4 - R772 West		0.4	3.65	0.29	A		0.4	3.62	0.28	A
	2040									
1 - N11 North	D7	0.5	3.65	0.33	A	D8	0.9	4.46	0.47	A
2 - R772 East		2.2	8.36	0.68	A		1.9	7.95	0.65	A
4 - R772 West		0.4	3.65	0.29	A		0.4	3.62	0.28	A
	2025 (With P&R Dev)									
1 - N11 North	D9	0.5	3.71	0.34	A	D10	1.0	4.65	0.48	A
2 - R772 East		2.2	8.53	0.68	A		1.9	8.06	0.65	A
4 - R772 West		0.4	3.72	0.30	A		0.5	3.80	0.31	A
	2030 (With P&R Dev)									
1 - N11 North	D11	0.5	3.71	0.34	A	D12	1.0	4.71	0.49	A
2 - R772 East		2.2	8.53	0.68	A		1.9	8.06	0.65	A
4 - R772 West		0.4	3.72	0.30	A		0.5	3.86	0.33	A

	2040 (With P&R Dev)									
1 - N11 North	D13	0.6	3.72	0.34	A	D14	1.0	4.84	0.49	A
2 - R772 East		2.2	8.53	0.68	A		1.9	8.06	0.65	A
4 - R772 West		0.5	3.74	0.30	A		0.6	3.98	0.35	A

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

File summary

File Description

Title	
Location	
Site number	
Date	16/12/2022
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	DOMAIN\jyotsna.singh
Description	

Units

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

Analysis Options

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

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2022	AM	ONE HOUR	08:00	09:30	15
D2	2022	PM	ONE HOUR	17:00	18:30	15
D3	2025	AM	ONE HOUR	08:00	09:30	15
D4	2025	PM	ONE HOUR	17:00	18:30	15
D5	2030	AM	ONE HOUR	08:00	09:30	15
D6	2030	PM	ONE HOUR	17:00	18:30	15
D7	2040	AM	ONE HOUR	08:00	09:30	15
D8	2040	PM	ONE HOUR	17:00	18:30	15
D9	2025 (With P&R Dev)	AM	ONE HOUR	08:00	09:30	15
D10	2025 (With P&R Dev)	PM	ONE HOUR	17:00	18:30	15
D11	2030 (With P&R Dev)	AM	ONE HOUR	08:00	09:30	15
D12	2030 (With P&R Dev)	PM	ONE HOUR	17:00	18:30	15
D13	2040 (With P&R Dev)	AM	ONE HOUR	08:00	09:30	15
D14	2040 (With P&R Dev)	PM	ONE HOUR	17:00	18:30	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

2022, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	J16 Ashford- Western Roundabout	Standard Roundabout		1, 2, 3, 4	5.82	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	5.82	A

Arms

Arms

Arm	Name	Description	No give-way line
1	N11 North		
2	R772 East		
3	N11 South		
4	R772 West		

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Entry only	Exit only
1 - N11 North	4.00	6.90	16.0	25.0	55.0	19.6	✓	
2 - R772 East	3.60	6.50	5.7	21.0	55.0	22.0		
3 - N11 South								✓
4 - R772 West	3.77	5.60	6.9	20.0	55.0	27.0		

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - N11 North	0.624	1849
2 - R772 East	0.550	1468
3 - N11 South		
4 - R772 West	0.543	1457

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

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2022	AM	ONE HOUR	08:00	09:30	15

Vehicle mix source	PCU Factor for a HV (PCU)

HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - N11 North		✓	474	100.000
2 - R772 East		✓	851	100.000
3 - N11 South				
4 - R772 West		✓	364	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - N11 North	2 - R772 East	3 - N11 South	4 - R772 West
From	1 - N11 North	0	452	0	22
	2 - R772 East	0	0	26	826
	3 - N11 South	0	0	0	0
	4 - R772 West	0	297	68	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1 - N11 North	2 - R772 East	3 - N11 South	4 - R772 West
From	1 - N11 North	0	7	0	10
	2 - R772 East	0	0	25	6
	3 - N11 South	0	0	0	0
	4 - R772 West	0	4	12	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1 - N11 North	0.33	3.59	0.5	A
2 - R772 East	0.66	8.01	2.1	A
3 - N11 South				
4 - R772 West	0.28	3.59	0.4	A

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	357	273	1679	0.213	356	0.3	2.923	A
2 - R772 East	641	67	1431	0.448	638	0.9	4.793	A
3 - N11 South		635						
4 - R772 West	274	0	1457	0.188	273	0.2	3.204	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	426	327	1645	0.259	426	0.4	3.174	A

2 - R772 East	765	80	1424	0.538	764	1.2	5.774	A
3 - N11 South		760						
4 - R772 West	327	0	1457	0.225	327	0.3	3.360	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	522	400	1599	0.326	522	0.5	3.589	A
2 - R772 East	937	98	1414	0.663	934	2.0	7.904	A
3 - N11 South		930						
4 - R772 West	401	0	1457	0.275	400	0.4	3.594	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	522	401	1599	0.326	522	0.5	3.592	A
2 - R772 East	937	98	1414	0.663	937	2.1	8.009	A
3 - N11 South		933						
4 - R772 West	401	0	1457	0.275	401	0.4	3.594	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	426	328	1645	0.259	427	0.4	3.181	A
2 - R772 East	765	80	1424	0.538	769	1.3	5.857	A
3 - N11 South		765						
4 - R772 West	327	0	1457	0.225	328	0.3	3.365	A

09:15 - 09:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	357	274	1678	0.213	357	0.3	2.933	A
2 - R772 East	641	67	1431	0.448	643	0.9	4.854	A
3 - N11 South		640						
4 - R772 West	274	0	1457	0.188	274	0.2	3.210	A

2022, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	J16 Ashford- Western Roundabout	Standard Roundabout		1, 2, 3, 4	5.62	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	5.62	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2022	PM	ONE HOUR	17:00	18:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - N11 North		✓	679	100.000
2 - R772 East		✓	777	100.000
3 - N11 South				
4 - R772 West		✓	359	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - N11 North	2 - R772 East	3 - N11 South	4 - R772 West
From	1 - N11 North	0	603	5	71
	2 - R772 East	0	2	68	708
	3 - N11 South	0	0	0	0
	4 - R772 West	0	238	121	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1 - N11 North	2 - R772 East	3 - N11 South	4 - R772 West
From	1 - N11 North	0	5	0	0
	2 - R772 East	0	0	5	5
	3 - N11 South	0	0	0	0
	4 - R772 West	0	9	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1 - N11 North	0.47	4.38	0.9	A
2 - R772 East	0.63	7.64	1.8	A
3 - N11 South				
4 - R772 West	0.27	3.59	0.4	A

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	511	271	1680	0.304	509	0.5	3.192	A
2 - R772 East	585	148	1387	0.422	582	0.8	4.663	A
3 - N11 South		585						
4 - R772 West	270	1	1456	0.185	269	0.2	3.205	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	610	324	1647	0.371	610	0.6	3.606	A
2 - R772 East	699	177	1370	0.510	698	1.1	5.586	A
3 - N11 South		701						
4 - R772 West	323	2	1456	0.221	322	0.3	3.359	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	747	397	1602	0.467	746	0.9	4.369	A
2 - R772 East	856	217	1349	0.635	853	1.8	7.555	A
3 - N11 South		857						
4 - R772 West	395	2	1456	0.271	395	0.4	3.589	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	747	397	1601	0.467	747	0.9	4.382	A
2 - R772 East	856	217	1348	0.635	856	1.8	7.641	A
3 - N11 South		860						
4 - R772 West	395	2	1456	0.271	395	0.4	3.589	A

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	610	325	1647	0.371	611	0.6	3.621	A
2 - R772 East	699	178	1370	0.510	702	1.1	5.654	A
3 - N11 South		705						
4 - R772 West	323	2	1456	0.221	323	0.3	3.364	A

18:15 - 18:30

	Total							

Arm	Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	511	272	1680	0.304	512	0.5	3.206	A
2 - R772 East	585	149	1386	0.422	587	0.8	4.718	A
3 - N11 South		589						
4 - R772 West	270	2	1456	0.185	270	0.2	3.212	A

2025, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	J16 Ashford- Western Roundabout	Standard Roundabout		1, 2, 3, 4	6.02	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	6.02	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D3	2025	AM	ONE HOUR	08:00	09:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - N11 North		✓	481	100.000
2 - R772 East		✓	871	100.000
3 - N11 South				
4 - R772 West		✓	381	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - N11 North	2 - R772 East	3 - N11 South	4 - R772 West
From	1 - N11 North	0	459	0	22
	2 - R772 East	0	0	26	845
	3 - N11 South	0	0	0	0
	4 - R772 West	0	313	68	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1 - N11 North	2 - R772 East	3 - N11 South	4 - R772 West
From	1 - N11 North	0	7	0	10
	2 - R772 East	0	0	25	5
	3 - N11 South	0	0	0	0
	4 - R772 West	0	4	12	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1 - N11 North	0.33	3.65	0.5	A
2 - R772 East	0.68	8.36	2.2	A
3 - N11 South				
4 - R772 West	0.29	3.65	0.4	A

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	362	285	1671	0.217	361	0.3	2.948	A
2 - R772 East	656	67	1431	0.458	652	0.9	4.871	A
3 - N11 South		649						
4 - R772 West	286	0	1457	0.197	285	0.3	3.228	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	432	342	1636	0.264	432	0.4	3.211	A
2 - R772 East	783	80	1424	0.550	781	1.3	5.917	A
3 - N11 South		778						
4 - R772 West	342	0	1457	0.235	342	0.3	3.395	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	529	419	1588	0.333	529	0.5	3.648	A
2 - R772 East	959	98	1414	0.678	955	2.2	8.229	A
3 - N11 South		951						
4 - R772 West	419	0	1457	0.287	419	0.4	3.643	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	529	419	1588	0.333	529	0.5	3.652	A
2 - R772 East	959	98	1414	0.678	959	2.2	8.364	A
3 - N11 South		954						
4 - R772 West	419	0	1457	0.287	419	0.4	3.646	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	432	342	1636	0.264	433	0.4	3.218	A
2 - R772 East	783	80	1424	0.550	786	1.3	6.014	A
3 - N11 South		783						
4 - R772 West	342	0	1457	0.235	342	0.3	3.400	A

09:15 - 09:30

	Total							

Arm	Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	362	287	1670	0.217	362	0.3	2.956	A
2 - R772 East	656	67	1431	0.458	657	0.9	4.936	A
3 - N11 South		654						
4 - R772 West	286	0	1457	0.197	287	0.3	3.235	A

2025, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	J16 Ashford- Western Roundabout	Standard Roundabout		1, 2, 3, 4	5.79	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	5.79	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D4	2025	PM	ONE HOUR	17:00	18:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - N11 North		✓	686	100.000
2 - R772 East		✓	796	100.000
3 - N11 South				
4 - R772 West		✓	369	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - N11 North	**2 - R772 East**	**3 - N11 South**	**4 - R772 West**
From	**1 - N11 North**	0	610	5	71
	2 - R772 East	0	2	68	726
	3 - N11 South	0	0	0	0
	4 - R772 West	0	247	121	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1 - N11 North	**2 - R772 East**	**3 - N11 South**	**4 - R772 West**
From	**1 - N11 North**	0	4	0	0
	2 - R772 East	0	0	5	4
	3 - N11 South	0	0	0	0
	4 - R772 West	0	8	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1 - N11 North	0.47	4.46	0.9	A
2 - R772 East	0.65	7.95	1.9	A
3 - N11 South				
4 - R772 West	0.28	3.62	0.4	A

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	517	278	1676	0.308	515	0.5	3.215	A
2 - R772 East	599	148	1387	0.432	596	0.8	4.735	A
3 - N11 South		599						
4 - R772 West	277	1	1456	0.190	276	0.2	3.220	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	617	333	1642	0.376	616	0.6	3.646	A
2 - R772 East	715	177	1370	0.522	714	1.1	5.715	A
3 - N11 South		717						
4 - R772 West	331	2	1456	0.227	331	0.3	3.379	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	756	408	1595	0.474	754	0.9	4.443	A
2 - R772 East	876	217	1349	0.650	873	1.9	7.854	A
3 - N11 South		877						
4 - R772 West	406	2	1456	0.279	405	0.4	3.620	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	756	408	1595	0.474	756	0.9	4.456	A
2 - R772 East	876	217	1348	0.650	876	1.9	7.954	A
3 - N11 South		880						
4 - R772 West	406	2	1456	0.279	406	0.4	3.620	A

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	617	333	1641	0.376	618	0.6	3.659	A
2 - R772 East	715	178	1370	0.522	718	1.2	5.795	A
3 - N11 South		721						
4 - R772 West	331	2	1456	0.227	332	0.3	3.382	A

18:15 - 18:30

	Total							

Arm	Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	517	279	1675	0.308	517	0.5	3.234	A
2 - R772 East	599	149	1386	0.432	601	0.8	4.792	A
3 - N11 South		603						
4 - R772 West	277	2	1456	0.190	278	0.2	3.226	A

2030, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	J16 Ashford- Western Roundabout	Standard Roundabout		1, 2, 3, 4	6.02	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	6.02	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D5	2030	AM	ONE HOUR	08:00	09:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - N11 North		✓	481	100.000
2 - R772 East		✓	871	100.000
3 - N11 South				
4 - R772 West		✓	381	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - N11 North	2 - R772 East	3 - N11 South	4 - R772 West
From	1 - N11 North	0	459	0	22
	2 - R772 East	0	0	26	845
	3 - N11 South	0	0	0	0
	4 - R772 West	0	313	68	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1 - N11 North	2 - R772 East	3 - N11 South	4 - R772 West
From	1 - N11 North	0	7	0	10
	2 - R772 East	0	0	25	5
	3 - N11 South	0	0	0	0
	4 - R772 West	0	4	12	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1 - N11 North	0.33	3.65	0.5	A
2 - R772 East	0.68	8.36	2.2	A
3 - N11 South				
4 - R772 West	0.29	3.65	0.4	A

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	362	285	1671	0.217	361	0.3	2.948	A
2 - R772 East	656	67	1431	0.458	652	0.9	4.871	A
3 - N11 South		649						
4 - R772 West	286	0	1457	0.197	285	0.3	3.228	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	432	342	1636	0.264	432	0.4	3.211	A
2 - R772 East	783	80	1424	0.550	781	1.3	5.917	A
3 - N11 South		778						
4 - R772 West	342	0	1457	0.235	342	0.3	3.395	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	529	419	1588	0.333	529	0.5	3.648	A
2 - R772 East	959	98	1414	0.678	955	2.2	8.229	A
3 - N11 South		951						
4 - R772 West	419	0	1457	0.287	419	0.4	3.643	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	529	419	1588	0.333	529	0.5	3.652	A
2 - R772 East	959	98	1414	0.678	959	2.2	8.364	A
3 - N11 South		954						
4 - R772 West	419	0	1457	0.287	419	0.4	3.646	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	432	342	1636	0.264	433	0.4	3.218	A
2 - R772 East	783	80	1424	0.550	786	1.3	6.014	A
3 - N11 South		783						
4 - R772 West	342	0	1457	0.235	342	0.3	3.400	A

09:15 - 09:30

	Total							

Arm	Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	362	287	1670	0.217	362	0.3	2.956	A
2 - R772 East	656	67	1431	0.458	657	0.9	4.936	A
3 - N11 South		654						
4 - R772 West	286	0	1457	0.197	287	0.3	3.235	A

2030, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	J16 Ashford- Western Roundabout	Standard Roundabout		1, 2, 3, 4	5.79	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	5.79	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D6	2030	PM	ONE HOUR	17:00	18:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - N11 North		✓	686	100.000
2 - R772 East		✓	796	100.000
3 - N11 South				
4 - R772 West		✓	369	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - N11 North	2 - R772 East	3 - N11 South	4 - R772 West
From	1 - N11 North	0	610	5	71
	2 - R772 East	0	2	68	726
	3 - N11 South	0	0	0	0
	4 - R772 West	0	247	121	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1 - N11 North	2 - R772 East	3 - N11 South	4 - R772 West
From	1 - N11 North	0	4	0	0
	2 - R772 East	0	0	5	4
	3 - N11 South	0	0	0	0
	4 - R772 West	0	8	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1 - N11 North	0.47	4.46	0.9	A
2 - R772 East	0.65	7.95	1.9	A
3 - N11 South				
4 - R772 West	0.28	3.62	0.4	A

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	517	278	1676	0.308	515	0.5	3.215	A
2 - R772 East	599	148	1387	0.432	596	0.8	4.735	A
3 - N11 South		599						
4 - R772 West	277	1	1456	0.190	276	0.2	3.220	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	617	333	1642	0.376	616	0.6	3.646	A
2 - R772 East	715	177	1370	0.522	714	1.1	5.715	A
3 - N11 South		717						
4 - R772 West	331	2	1456	0.227	331	0.3	3.379	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	756	408	1595	0.474	754	0.9	4.443	A
2 - R772 East	876	217	1349	0.650	873	1.9	7.854	A
3 - N11 South		877						
4 - R772 West	406	2	1456	0.279	405	0.4	3.620	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	756	408	1595	0.474	756	0.9	4.456	A
2 - R772 East	876	217	1348	0.650	876	1.9	7.954	A
3 - N11 South		880						
4 - R772 West	406	2	1456	0.279	406	0.4	3.620	A

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	617	333	1641	0.376	618	0.6	3.659	A
2 - R772 East	715	178	1370	0.522	718	1.2	5.795	A
3 - N11 South		721						
4 - R772 West	331	2	1456	0.227	332	0.3	3.382	A

18:15 - 18:30

	Total							

Arm	Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	517	279	1675	0.308	517	0.5	3.234	A
2 - R772 East	599	149	1386	0.432	601	0.8	4.792	A
3 - N11 South		603						
4 - R772 West	277	2	1456	0.190	278	0.2	3.226	A

2040, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	J16 Ashford- Western Roundabout	Standard Roundabout		1, 2, 3, 4	6.02	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	6.02	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D7	2040	AM	ONE HOUR	08:00	09:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - N11 North		✓	481	100.000
2 - R772 East		✓	871	100.000
3 - N11 South				
4 - R772 West		✓	381	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - N11 North	2 - R772 East	3 - N11 South	4 - R772 West
From	1 - N11 North	0	459	0	22
	2 - R772 East	0	0	26	845
	3 - N11 South	0	0	0	0
	4 - R772 West	0	313	68	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1 - N11 North	2 - R772 East	3 - N11 South	4 - R772 West
From	1 - N11 North	0	7	0	10
	2 - R772 East	0	0	25	5
	3 - N11 South	0	0	0	0
	4 - R772 West	0	4	12	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1 - N11 North	0.33	3.65	0.5	A
2 - R772 East	0.68	8.36	2.2	A
3 - N11 South				
4 - R772 West	0.29	3.65	0.4	A

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	362	285	1671	0.217	361	0.3	2.948	A
2 - R772 East	655	67	1431	0.458	652	0.9	4.871	A
3 - N11 South		649						
4 - R772 West	286	0	1457	0.197	285	0.3	3.229	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	432	342	1636	0.264	432	0.4	3.211	A
2 - R772 East	783	80	1424	0.550	781	1.3	5.916	A
3 - N11 South		778						
4 - R772 West	342	0	1457	0.235	342	0.3	3.395	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	529	419	1588	0.333	529	0.5	3.648	A
2 - R772 East	959	98	1414	0.678	955	2.2	8.254	A
3 - N11 South		951						
4 - R772 West	419	0	1457	0.288	419	0.4	3.643	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	529	419	1588	0.333	529	0.5	3.652	A
2 - R772 East	959	98	1414	0.678	958	2.2	8.364	A
3 - N11 South		954						
4 - R772 West	419	0	1457	0.288	419	0.4	3.646	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	432	342	1636	0.264	433	0.4	3.218	A
2 - R772 East	783	80	1424	0.550	786	1.3	6.013	A
3 - N11 South		783						
4 - R772 West	342	0	1457	0.235	342	0.3	3.400	A

09:15 - 09:30

	Total							

Arm	Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	362	287	1670	0.217	362	0.3	2.956	A
2 - R772 East	655	67	1431	0.458	657	0.9	4.937	A
3 - N11 South		654						
4 - R772 West	286	0	1457	0.197	287	0.3	3.238	A

2040, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	J16 Ashford- Western Roundabout	Standard Roundabout		1, 2, 3, 4	5.79	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	5.79	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D8	2040	PM	ONE HOUR	17:00	18:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - N11 North		✓	686	100.000
2 - R772 East		✓	796	100.000
3 - N11 South				
4 - R772 West		✓	369	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - N11 North	2 - R772 East	3 - N11 South	4 - R772 West
From	1 - N11 North	0	610	5	71
	2 - R772 East	0	2	68	726
	3 - N11 South	0	0	0	0
	4 - R772 West	0	247	121	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1 - N11 North	2 - R772 East	3 - N11 South	4 - R772 West
From	1 - N11 North	0	4	0	0
	2 - R772 East	0	0	5	4
	3 - N11 South	0	0	0	0
	4 - R772 West	0	8	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1 - N11 North	0.47	4.46	0.9	A
2 - R772 East	0.65	7.95	1.9	A
3 - N11 South				
4 - R772 West	0.28	3.62	0.4	A

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	517	278	1676	0.308	515	0.5	3.215	A
2 - R772 East	599	148	1387	0.432	596	0.8	4.735	A
3 - N11 South		599						
4 - R772 West	277	1	1456	0.191	276	0.2	3.220	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	617	333	1642	0.376	616	0.6	3.646	A
2 - R772 East	715	177	1370	0.522	714	1.1	5.715	A
3 - N11 South		717						
4 - R772 West	331	2	1456	0.228	331	0.3	3.379	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	756	408	1595	0.474	754	0.9	4.443	A
2 - R772 East	876	217	1349	0.650	873	1.9	7.854	A
3 - N11 South		877						
4 - R772 West	406	2	1456	0.279	405	0.4	3.620	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	756	408	1595	0.474	756	0.9	4.457	A
2 - R772 East	876	217	1348	0.650	876	1.9	7.954	A
3 - N11 South		880						
4 - R772 West	406	2	1456	0.279	406	0.4	3.620	A

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	617	333	1641	0.376	618	0.6	3.662	A
2 - R772 East	715	178	1370	0.522	718	1.2	5.792	A
3 - N11 South		721						
4 - R772 West	331	2	1456	0.228	332	0.3	3.384	A

18:15 - 18:30

	Total							

Arm	Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	517	279	1675	0.308	517	0.5	3.231	A
2 - R772 East	599	149	1386	0.432	601	0.8	4.794	A
3 - N11 South		603						
4 - R772 West	277	2	1456	0.191	278	0.2	3.226	A

2025 (With P&R Dev), AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	J16 Ashford- Western Roundabout	Standard Roundabout		1, 2, 3, 4	6.11	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	6.11	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D9	2025 (With P&R Dev)	AM	ONE HOUR	08:00	09:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - N11 North		✓	485	100.000
2 - R772 East		✓	873	100.000
3 - N11 South				
4 - R772 West		✓	392	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - N11 North	2 - R772 East	3 - N11 South	4 - R772 West
From	1 - N11 North	0	457	0	28
	2 - R772 East	0	0	26	847
	3 - N11 South	0	0	0	0
	4 - R772 West	0	321	72	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1 - N11 North	2 - R772 East	3 - N11 South	4 - R772 West
From	1 - N11 North	0	7	0	22
	2 - R772 East	0	0	25	6
	3 - N11 South	0	0	0	0

	4 - R772 West	0	4	15	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1 - N11 North	0.34	3.71	0.5	A
2 - R772 East	0.68	8.53	2.2	A
3 - N11 South				
4 - R772 West	0.30	3.72	0.4	A

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	365	294	1666	0.219	364	0.3	2.976	A
2 - R772 East	657	74	1427	0.460	653	0.9	4.910	A
3 - N11 South		655						
4 - R772 West	295	0	1457	0.203	294	0.3	3.276	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	436	352	1629	0.267	435	0.4	3.248	A
2 - R772 East	785	89	1419	0.553	783	1.3	5.985	A
3 - N11 South		785						
4 - R772 West	353	0	1457	0.242	352	0.3	3.451	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	534	432	1580	0.338	533	0.5	3.703	A
2 - R772 East	961	109	1408	0.682	957	2.2	8.396	A
3 - N11 South		960						
4 - R772 West	432	0	1457	0.296	432	0.4	3.715	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	534	432	1580	0.338	534	0.5	3.706	A
2 - R772 East	961	109	1408	0.683	961	2.2	8.527	A
3 - N11 South		963						
4 - R772 West	432	0	1457	0.296	432	0.4	3.718	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	436	353	1629	0.267	436	0.4	3.253	A
2 - R772 East	785	89	1419	0.553	788	1.3	6.084	A
3 - N11 South		790						
4 - R772 West	353	0	1457	0.242	353	0.3	3.457	A

09:15 - 09:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	365	296	1665	0.219	365	0.3	2.987	A
2 - R772 East	657	75	1427	0.460	659	0.9	4.977	A
3 - N11 South		660						
4 - R772 West	295	0	1457	0.203	296	0.3	3.285	A

2025 (With P&R Dev), PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	J16 Ashford- Western Roundabout	Standard Roundabout		1, 2, 3, 4	5.90	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	5.90	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D10	2025 (With P&R Dev)	PM	ONE HOUR	17:00	18:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - N11 North		✓	688	100.000
2 - R772 East		✓	798	100.000
3 - N11 South				
4 - R772 West		✓	415	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - N11 North	2 - R772 East	3 - N11 South	4 - R772 West
From	1 - N11 North	0	608	5	75
	2 - R772 East	0	2	68	728
	3 - N11 South	0	0	0	0
	4 - R772 West	0	292	123	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1 - N11 North	2 - R772 East	3 - N11 South	4 - R772 West
From	1 - N11 North	0	4	0	3
	2 - R772 East	0	0	5	5
	3 - N11 South	0	0	0	0

	4 - R772 West	0	7	2	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1 - N11 North	0.48	4.65	1.0	A
2 - R772 East	0.65	8.06	1.9	A
3 - N11 South				
4 - R772 West	0.31	3.80	0.5	A

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	518	313	1654	0.313	516	0.5	3.287	A
2 - R772 East	601	152	1384	0.434	597	0.8	4.768	A
3 - N11 South		603						
4 - R772 West	313	1	1456	0.215	311	0.3	3.316	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	619	375	1615	0.383	618	0.6	3.755	A
2 - R772 East	717	183	1368	0.524	716	1.1	5.766	A
3 - N11 South		723						
4 - R772 West	373	2	1456	0.256	373	0.4	3.508	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	758	459	1563	0.485	756	1.0	4.638	A
2 - R772 East	878	224	1345	0.653	875	1.9	7.962	A
3 - N11 South		884						
4 - R772 West	457	2	1456	0.314	457	0.5	3.800	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	758	459	1563	0.485	758	1.0	4.655	A
2 - R772 East	878	224	1345	0.653	878	1.9	8.064	A
3 - N11 South		887						
4 - R772 West	457	2	1456	0.314	457	0.5	3.803	A

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	619	375	1615	0.383	620	0.7	3.770	A
2 - R772 East	717	183	1367	0.525	720	1.2	5.847	A
3 - N11 South		727						
4 - R772 West	373	2	1456	0.256	374	0.4	3.511	A

18:15 - 18:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	518	314	1653	0.313	519	0.5	3.307	A
2 - R772 East	601	153	1384	0.434	602	0.8	4.825	A
3 - N11 South		608						
4 - R772 West	313	2	1456	0.215	313	0.3	3.323	A

2030 (With P&R Dev), AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	J16 Ashford- Western Roundabout	Standard Roundabout		1, 2, 3, 4	6.11	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	6.11	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D11	2030 (With P&R Dev)	AM	ONE HOUR	08:00	09:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - N11 North		✓	485	100.000
2 - R772 East		✓	873	100.000
3 - N11 South				
4 - R772 West		✓	395	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - N11 North	2 - R772 East	3 - N11 South	4 - R772 West
From	1 - N11 North	0	457	0	28
	2 - R772 East	0	0	26	847
	3 - N11 South	0	0	0	0
	4 - R772 West	0	323	72	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1 - N11 North	2 - R772 East	3 - N11 South	4 - R772 West
From	1 - N11 North	0	7	0	22
	2 - R772 East	0	0	25	6
	3 - N11 South	0	0	0	0

	4 - R772 West	0	4	15	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1 - N11 North	0.34	3.71	0.5	A
2 - R772 East	0.68	8.53	2.2	A
3 - N11 South				
4 - R772 West	0.30	3.72	0.4	A

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	365	296	1664	0.219	364	0.3	2.979	A
2 - R772 East	657	74	1427	0.460	653	0.9	4.910	A
3 - N11 South		655						
4 - R772 West	297	0	1457	0.204	296	0.3	3.278	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	436	355	1628	0.268	435	0.4	3.252	A
2 - R772 East	785	89	1419	0.553	783	1.3	5.985	A
3 - N11 South		785						
4 - R772 West	355	0	1457	0.244	355	0.3	3.455	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	534	434	1578	0.338	533	0.5	3.709	A
2 - R772 East	961	109	1408	0.682	957	2.2	8.396	A
3 - N11 South		960						
4 - R772 West	435	0	1457	0.298	434	0.4	3.722	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	534	435	1578	0.338	534	0.5	3.713	A
2 - R772 East	961	109	1408	0.683	961	2.2	8.527	A
3 - N11 South		963						
4 - R772 West	435	0	1457	0.298	435	0.4	3.725	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	436	355	1627	0.268	436	0.4	3.257	A
2 - R772 East	785	89	1419	0.553	788	1.3	6.086	A
3 - N11 South		790						
4 - R772 West	355	0	1457	0.244	355	0.3	3.458	A

09:15 - 09:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	365	298	1664	0.219	365	0.3	2.987	A
2 - R772 East	657	75	1427	0.460	659	0.9	4.977	A
3 - N11 South		660						
4 - R772 West	297	0	1457	0.204	298	0.3	3.285	A

2030 (With P&R Dev), PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	J16 Ashford- Western Roundabout	Standard Roundabout		1, 2, 3, 4	5.92	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	5.92	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D12	2030 (With P&R Dev)	PM	ONE HOUR	17:00	18:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - N11 North		✓	688	100.000
2 - R772 East		✓	798	100.000
3 - N11 South				
4 - R772 West		✓	430	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - N11 North	**2 - R772 East**	**3 - N11 South**	**4 - R772 West**
From	**1 - N11 North**	0	608	5	75
	2 - R772 East	0	2	68	728
	3 - N11 South	0	0	0	0
	4 - R772 West	0	307	123	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1 - N11 North	**2 - R772 East**	**3 - N11 South**	**4 - R772 West**
From	**1 - N11 North**	0	4	0	3
	2 - R772 East	0	0	5	5
	3 - N11 South	0	0	0	0

	4 - R772 West	0	7	2	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1 - N11 North	0.49	4.71	1.0	A
2 - R772 East	0.65	8.06	1.9	A
3 - N11 South				
4 - R772 West	0.33	3.86	0.5	A

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	518	324	1647	0.315	516	0.5	3.308	A
2 - R772 East	601	152	1384	0.434	597	0.8	4.768	A
3 - N11 South		603						
4 - R772 West	324	1	1456	0.222	322	0.3	3.342	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	619	388	1607	0.385	618	0.6	3.787	A
2 - R772 East	717	183	1368	0.524	716	1.1	5.766	A
3 - N11 South		723						
4 - R772 West	386	2	1456	0.265	386	0.4	3.544	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	758	475	1553	0.488	756	1.0	4.698	A
2 - R772 East	878	224	1345	0.653	875	1.9	7.962	A
3 - N11 South		884						
4 - R772 West	473	2	1456	0.325	473	0.5	3.856	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	758	476	1552	0.488	758	1.0	4.714	A
2 - R772 East	878	224	1345	0.653	878	1.9	8.064	A
3 - N11 South		887						
4 - R772 West	473	2	1456	0.325	473	0.5	3.859	A

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	619	389	1607	0.385	620	0.7	3.805	A
2 - R772 East	717	183	1367	0.525	720	1.2	5.849	A
3 - N11 South		727						
4 - R772 West	386	2	1456	0.265	387	0.4	3.550	A

18:15 - 18:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	518	325	1646	0.315	519	0.5	3.325	A
2 - R772 East	601	153	1384	0.434	602	0.8	4.827	A
3 - N11 South		608						
4 - R772 West	324	2	1456	0.222	324	0.3	3.349	A

2040 (With P&R Dev), AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	J16 Ashford- Western Roundabout	Standard Roundabout		1, 2, 3, 4	6.11	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	6.11	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D13	2040 (With P&R Dev)	AM	ONE HOUR	08:00	09:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - N11 North		✓	485	100.000
2 - R772 East		✓	873	100.000
3 - N11 South				
4 - R772 West		✓	400	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - N11 North	2 - R772 East	3 - N11 South	4 - R772 West
From	1 - N11 North	0	457	0	28
	2 - R772 East	0	0	26	847
	3 - N11 South	0	0	0	0
	4 - R772 West	0	328	72	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1 - N11 North	2 - R772 East	3 - N11 South	4 - R772 West
From	1 - N11 North	0	7	0	22
	2 - R772 East	0	0	25	6
	3 - N11 South	0	0	0	0

	4 - R772 West	0	4	15	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1 - N11 North	0.34	3.72	0.6	A
2 - R772 East	0.68	8.53	2.2	A
3 - N11 South				
4 - R772 West	0.30	3.74	0.5	A

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	365	300	1662	0.220	364	0.3	2.984	A
2 - R772 East	657	74	1427	0.460	653	0.9	4.910	A
3 - N11 South		655						
4 - R772 West	301	0	1457	0.207	300	0.3	3.288	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	436	359	1625	0.268	435	0.4	3.260	A
2 - R772 East	785	89	1419	0.553	783	1.3	5.985	A
3 - N11 South		785						
4 - R772 West	359	0	1457	0.247	359	0.3	3.469	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	534	440	1575	0.339	533	0.5	3.721	A
2 - R772 East	961	109	1408	0.682	957	2.2	8.396	A
3 - N11 South		960						
4 - R772 West	440	0	1457	0.302	440	0.5	3.741	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	534	440	1575	0.339	534	0.6	3.725	A
2 - R772 East	961	109	1408	0.683	961	2.2	8.527	A
3 - N11 South		963						
4 - R772 West	440	0	1457	0.302	440	0.5	3.744	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	436	360	1625	0.268	436	0.4	3.267	A
2 - R772 East	785	89	1419	0.553	788	1.3	6.086	A
3 - N11 South		790						
4 - R772 West	359	0	1457	0.247	360	0.3	3.471	A

09:15 - 09:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	365	301	1661	0.220	365	0.3	2.995	A
2 - R772 East	657	75	1427	0.460	659	0.9	4.979	A
3 - N11 South		660						
4 - R772 West	301	0	1457	0.207	301	0.3	3.295	A

2040 (With P&R Dev), PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	J16 Ashford- Western Roundabout	Standard Roundabout		1, 2, 3, 4	5.96	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	5.96	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D14	2040 (With P&R Dev)	PM	ONE HOUR	17:00	18:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - N11 North		✓	688	100.000
2 - R772 East		✓	798	100.000
3 - N11 South				
4 - R772 West		✓	460	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - N11 North	2 - R772 East	3 - N11 South	4 - R772 West
From	1 - N11 North	0	608	5	75
	2 - R772 East	0	2	68	728
	3 - N11 South	0	0	0	0
	4 - R772 West	0	336	123	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1 - N11 North	2 - R772 East	3 - N11 South	4 - R772 West
From	1 - N11 North	0	4	0	3
	2 - R772 East	0	0	5	5
	3 - N11 South	0	0	0	0

	4 - R772 West	0	6	2	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1 - N11 North	0.49	4.84	1.0	A
2 - R772 East	0.65	8.06	1.9	A
3 - N11 South				
4 - R772 West	0.35	3.98	0.6	A

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	518	346	1633	0.317	516	0.5	3.349	A
2 - R772 East	601	152	1384	0.434	597	0.8	4.768	A
3 - N11 South		603						
4 - R772 West	346	1	1456	0.238	345	0.3	3.398	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	619	415	1591	0.389	618	0.7	3.851	A
2 - R772 East	717	183	1368	0.524	716	1.1	5.766	A
3 - N11 South		723						
4 - R772 West	413	2	1456	0.284	413	0.4	3.623	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	758	508	1532	0.494	756	1.0	4.819	A
2 - R772 East	878	224	1345	0.653	875	1.9	7.962	A
3 - N11 South		884						
4 - R772 West	506	2	1456	0.347	505	0.6	3.974	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	758	508	1532	0.495	758	1.0	4.838	A
2 - R772 East	878	224	1345	0.653	878	1.9	8.064	A
3 - N11 South		887						
4 - R772 West	506	2	1456	0.347	506	0.6	3.979	A

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	619	415	1590	0.389	620	0.7	3.870	A
2 - R772 East	717	183	1367	0.525	720	1.2	5.847	A
3 - N11 South		727						
4 - R772 West	413	2	1456	0.284	414	0.4	3.630	A

18:15 - 18:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - N11 North	518	348	1632	0.317	519	0.5	3.369	A
2 - R772 East	601	153	1384	0.434	602	0.8	4.826	A
3 - N11 South		608						
4 - R772 West	346	2	1456	0.238	346	0.3	3.408	A

Junctions 10

ARCADY 10 - Roundabout Module

Filename: J16 Western Roundabout.j10
Path: Q:\2020 Jobs\20_008L Ashford Rathnew\Traffic Study\Junction 16
Report generation date: 24/07/2023 12:20:59

Summary of junction performance

	AM					PM				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
	2022									
Arm 2	D1	1.6	6.48	0.61	A	D2	1.3	5.71	0.56	A
Arm 3		0.2	3.49	0.13	A		0.1	3.22	0.07	A
Arm 4		0.6	4.95	0.36	A		0.5	4.29	0.33	A
	2025									
Arm 2	D3	1.7	6.71	0.62	A	D4	1.4	5.89	0.58	A
Arm 3		0.2	3.53	0.13	A		0.1	3.26	0.08	A
Arm 4		0.6	5.13	0.38	A		0.5	4.36	0.34	A
	2030									
Arm 2	D5	1.7	6.71	0.62	A	D6	1.4	5.89	0.58	A
Arm 3		0.2	3.53	0.13	A		0.1	3.26	0.08	A
Arm 4		0.6	5.13	0.38	A		0.5	4.36	0.34	A
	2040									
Arm 2	D7	1.7	6.71	0.62	A	D8	1.4	5.89	0.58	A
Arm 3		0.2	3.53	0.13	A		0.1	3.26	0.08	A
Arm 4		0.6	5.13	0.38	A		0.5	4.36	0.34	A
	2025 (With P&R Dev)									
Arm 2	D9	1.8	6.81	0.63	A	D10	1.4	5.94	0.58	A
Arm 3		0.2	3.67	0.17	A		0.1	3.30	0.08	A
Arm 4		0.7	5.32	0.40	A		0.6	4.67	0.38	A
	2030 (With P&R Dev)									
Arm 2	D11	1.8	6.81	0.63	A	D12	1.4	5.94	0.58	A
Arm 3		0.2	3.71	0.18	A		0.1	3.30	0.08	A
Arm 4		0.7	5.34	0.40	A		0.7	4.76	0.39	A

	2040 (With P&R Dev)									
Arm 2	D13	1.8	6.81	0.63	A	D14	1.4	5.94	0.58	A
Arm 3		0.3	3.80	0.21	A		0.1	3.30	0.09	A
Arm 4		0.7	5.38	0.40	A		0.7	4.95	0.42	A

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

File summary

File Description

Title	
Location	
Site number	
Date	16/12/2022
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	DOMAIN\jyotsna.singh
Description	

Units

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

Analysis Options

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

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2022	AM	ONE HOUR	08:00	09:30	15
D2	2022	PM	ONE HOUR	17:00	18:30	15
D3	2025	AM	ONE HOUR	08:00	09:30	15
D4	2025	PM	ONE HOUR	17:00	18:30	15
D5	2030	AM	ONE HOUR	08:00	09:30	15
D6	2030	PM	ONE HOUR	17:00	18:30	15
D7	2040	AM	ONE HOUR	08:00	09:30	15
D8	2040	PM	ONE HOUR	17:00	18:30	15
D9	2025 (With P&R Dev)	AM	ONE HOUR	08:00	09:30	15
D10	2025 (With P&R Dev)	PM	ONE HOUR	17:00	18:30	15
D11	2030 (With P&R Dev)	AM	ONE HOUR	08:00	09:30	15
D12	2030 (With P&R Dev)	PM	ONE HOUR	17:00	18:30	15
D13	2040 (With P&R Dev)	AM	ONE HOUR	08:00	09:30	15
D14	2040 (With P&R Dev)	PM	ONE HOUR	17:00	18:30	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

2022, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	J16 Ashford- Western Roundabout	Standard Roundabout		1, 2, 3, 4	5.71	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	5.71	A

Arms

Arms

Arm	Name	Description	No give-way line
1	N11 North		
2	R772 East		
3	N11 South		
4	R772 West		

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Entry only	Exit only
1								✓
2	3.80	5.38	6.6	21.0	52.0	13.0		
3	4.80	6.03	24.0	20.0	52.0	13.0	✓	
4	3.50	5.62	11.6	22.0	52.0	5.0		

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1		
2	0.581	1509
3	0.649	1879
4	0.606	1599

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

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2022	AM	ONE HOUR	08:00	09:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1				
2		✓	837	100.000
3		✓	155	100.000
4		✓	392	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	0	0	0
	2	573	0	0	264
	3	7	31	0	117
	4	68	323	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	6	0	0	6
	3	0	7	0	8
	4	3	5	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1				
2	0.61	6.48	1.6	A
3	0.13	3.49	0.2	A
4	0.36	4.95	0.6	A

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		265						
2	630	0	1509	0.417	627	0.8	4.302	A
3	116	627	1472	0.079	116	0.1	2.856	A
4	295	457	1322	0.223	294	0.3	3.663	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		318						
2	752	0	1509	0.498	751	1.0	5.017	A
3	139	751	1392	0.100	139	0.1	3.091	A
4	352	548	1267	0.278	352	0.4	4.115	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		389						
2	921	0	1509	0.610	919	1.6	6.427	A
3	170	919	1283	0.133	170	0.2	3.481	A
4	431	670	1193	0.361	430	0.6	4.938	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		390						
2	921	0	1509	0.610	921	1.6	6.477	A
3	170	921	1281	0.133	170	0.2	3.485	A
4	431	672	1192	0.362	431	0.6	4.954	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		319						
2	752	0	1509	0.498	754	1.1	5.064	A
3	139	754	1389	0.100	139	0.1	3.100	A
4	352	550	1266	0.278	353	0.4	4.132	A

09:15 - 09:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		267						
2	630	0	1509	0.417	631	0.8	4.345	A
3	116	631	1469	0.079	117	0.1	2.862	A
4	295	460	1320	0.223	295	0.3	3.678	A

2022, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	J16 Ashford- Western Roundabout	Standard Roundabout		1, 2, 3, 4	5.09	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	5.09	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2022	PM	ONE HOUR	17:00	18:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1				
2		✓	774	100.000
3		✓	90	100.000
4		✓	388	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	0	0	0
	2	418	0	0	356
	3	0	27	0	63
	4	48	339	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	4	0	0	4
	3	0	37	0	2
	4	9	4	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1				
2	0.56	5.71	1.3	A
3	0.07	3.22	0.1	A
4	0.33	4.29	0.5	A

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		274						
2	583	0	1509	0.386	580	0.7	4.026	A
3	67	580	1503	0.045	67	0.1	2.758	A
4	292	333	1397	0.209	291	0.3	3.395	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		329						
2	696	0	1509	0.461	695	0.9	4.602	A
3	80	695	1428	0.056	80	0.1	2.937	A
4	348	399	1357	0.257	348	0.4	3.726	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		402						
2	852	0	1509	0.565	850	1.3	5.678	A
3	99	850	1327	0.074	98	0.1	3.222	A
4	427	489	1303	0.327	426	0.5	4.285	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		403						
2	852	0	1509	0.565	852	1.3	5.709	A
3	99	852	1326	0.074	99	0.1	3.225	A
4	427	489	1303	0.328	427	0.5	4.293	A

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		329						
2	696	0	1509	0.461	697	0.9	4.631	A
3	80	697	1426	0.056	81	0.1	2.943	A
4	348	401	1357	0.257	349	0.4	3.736	A

18:15 - 18:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		276						
2	583	0	1509	0.386	584	0.7	4.056	A

3	67	584	1500	0.045	67	0.1	2.762	A
4	292	335	1396	0.209	292	0.3	3.406	A

2025, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	J16 Ashford- Western Roundabout	Standard Roundabout		1, 2, 3, 4	5.91	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	5.91	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D3	2025	AM	ONE HOUR	08:00	09:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1				
2		✓	856	100.000
3		✓	155	100.000
4		✓	408	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	0	0	0
	2	586	0	0	270
	3	7	31	0	117
	4	68	340	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	6	0	0	5
	3	0	7	0	8
	4	3	5	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1				
2	0.62	6.71	1.7	A
3	0.13	3.53	0.2	A
4	0.38	5.13	0.6	A

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		278						
2	644	0	1509	0.427	641	0.8	4.365	A
3	116	641	1463	0.080	116	0.1	2.875	A
4	307	467	1316	0.233	306	0.3	3.721	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		333						
2	769	0	1509	0.510	768	1.1	5.123	A
3	139	768	1380	0.101	139	0.1	3.119	A
4	367	560	1260	0.291	366	0.4	4.210	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		407						
2	942	0	1509	0.625	940	1.7	6.647	A
3	170	940	1269	0.134	170	0.2	3.524	A
4	449	685	1184	0.379	448	0.6	5.111	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		408						
2	942	0	1509	0.625	942	1.7	6.705	A
3	170	942	1267	0.134	170	0.2	3.529	A
4	449	686	1183	0.380	449	0.6	5.128	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		334						
2	769	0	1509	0.510	772	1.1	5.174	A
3	139	772	1378	0.101	139	0.1	3.128	A
4	367	562	1259	0.292	368	0.4	4.231	A

09:15 - 09:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		279						
2	644	0	1509	0.427	646	0.8	4.410	A

3	116	646	1460	0.080	117	0.1	2.884	A
4	307	470	1314	0.234	308	0.3	3.740	A

2025, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	J16 Ashford- Western Roundabout	Standard Roundabout		1, 2, 3, 4	5.23	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	5.23	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D4	2025	PM	ONE HOUR	17:00	18:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1				
2		✓	792	100.000
3		✓	90	100.000
4		✓	397	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	0	0	0
	2	422	0	0	370
	3	0	27	0	63
	4	48	349	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	4	0	0	4
	3	0	37	0	2
	4	9	4	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1				
2	0.58	5.89	1.4	A
3	0.08	3.26	0.1	A
4	0.34	4.36	0.5	A

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		282						
2	596	0	1509	0.395	594	0.7	4.083	A
3	67	594	1494	0.045	67	0.1	2.775	A
4	299	336	1396	0.214	298	0.3	3.420	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		337						
2	712	0	1509	0.472	711	0.9	4.691	A
3	80	711	1417	0.057	80	0.1	2.960	A
4	357	403	1355	0.263	357	0.4	3.763	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		413						
2	872	0	1509	0.578	870	1.4	5.851	A
3	99	870	1314	0.075	98	0.1	3.256	A
4	437	493	1300	0.336	437	0.5	4.347	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		413						
2	872	0	1509	0.578	872	1.4	5.885	A
3	99	872	1313	0.075	99	0.1	3.260	A
4	437	494	1300	0.336	437	0.5	4.355	A

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		338						
2	712	0	1509	0.472	714	0.9	4.725	A
3	80	714	1415	0.057	81	0.1	2.965	A
4	357	405	1354	0.264	358	0.4	3.771	A

18:15 - 18:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		283						
2	596	0	1509	0.395	598	0.7	4.116	A

3	67	598	1491	0.045	67	0.1	2.782	A
4	299	338	1394	0.214	299	0.3	3.434	A

2030, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	J16 Ashford- Western Roundabout	Standard Roundabout		1, 2, 3, 4	5.91	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	5.91	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D5	2030	AM	ONE HOUR	08:00	09:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1				
2		✓	856	100.000
3		✓	155	100.000
4		✓	408	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	0	0	0
	2	586	0	0	270
	3	7	31	0	117
	4	68	340	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	6	0	0	5
	3	0	7	0	8
	4	3	5	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1				
2	0.62	6.71	1.7	A
3	0.13	3.53	0.2	A
4	0.38	5.13	0.6	A

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		278						
2	644	0	1509	0.427	641	0.8	4.365	A
3	116	641	1463	0.080	116	0.1	2.875	A
4	307	467	1316	0.233	306	0.3	3.721	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		333						
2	769	0	1509	0.510	768	1.1	5.123	A
3	139	768	1380	0.101	139	0.1	3.119	A
4	367	560	1260	0.291	366	0.4	4.210	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		407						
2	942	0	1509	0.625	940	1.7	6.647	A
3	170	940	1269	0.134	170	0.2	3.524	A
4	449	685	1184	0.379	448	0.6	5.111	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		408						
2	942	0	1509	0.625	942	1.7	6.705	A
3	170	942	1267	0.134	170	0.2	3.529	A
4	449	686	1183	0.380	449	0.6	5.128	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		334						
2	769	0	1509	0.510	772	1.1	5.174	A
3	139	772	1378	0.101	139	0.1	3.128	A
4	367	562	1259	0.292	368	0.4	4.231	A

09:15 - 09:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		279						
2	644	0	1509	0.427	646	0.8	4.410	A

3	116	646	1460	0.080	117	0.1	2.884	A
4	307	470	1314	0.234	308	0.3	3.740	A

2030, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	J16 Ashford- Western Roundabout	Standard Roundabout		1, 2, 3, 4	5.23	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	5.23	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D6	2030	PM	ONE HOUR	17:00	18:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1				
2		✓	792	100.000
3		✓	90	100.000
4		✓	397	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	0	0	0
	2	422	0	0	370
	3	0	27	0	63
	4	48	349	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	4	0	0	4
	3	0	37	0	2
	4	9	4	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1				
2	0.58	5.89	1.4	A
3	0.08	3.26	0.1	A
4	0.34	4.36	0.5	A

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		282						
2	596	0	1509	0.395	594	0.7	4.083	A
3	67	594	1494	0.045	67	0.1	2.775	A
4	299	336	1396	0.214	298	0.3	3.420	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		337						
2	712	0	1509	0.472	711	0.9	4.691	A
3	80	711	1417	0.057	80	0.1	2.960	A
4	357	403	1355	0.263	357	0.4	3.763	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		413						
2	872	0	1509	0.578	870	1.4	5.851	A
3	99	870	1314	0.075	98	0.1	3.256	A
4	437	493	1300	0.336	437	0.5	4.347	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		413						
2	872	0	1509	0.578	872	1.4	5.885	A
3	99	872	1313	0.075	99	0.1	3.260	A
4	437	494	1300	0.336	437	0.5	4.355	A

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		338						
2	712	0	1509	0.472	714	0.9	4.725	A
3	80	714	1415	0.057	81	0.1	2.965	A
4	357	405	1354	0.264	358	0.4	3.771	A

18:15 - 18:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		283						
2	596	0	1509	0.395	598	0.7	4.116	A

3	67	598	1491	0.045	67	0.1	2.782	A
4	299	338	1394	0.214	299	0.3	3.434	A

2040, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	J16 Ashford- Western Roundabout	Standard Roundabout		1, 2, 3, 4	5.91	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	5.91	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D7	2040	AM	ONE HOUR	08:00	09:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1				
2		✓	856	100.000
3		✓	155	100.000
4		✓	408	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	0	0	0
	2	586	0	0	270
	3	7	31	0	117
	4	68	340	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	6	0	0	5
	3	0	7	0	8
	4	3	5	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1				
2	0.62	6.71	1.7	A
3	0.13	3.53	0.2	A
4	0.38	5.13	0.6	A

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		278						
2	644	0	1509	0.427	641	0.8	4.365	A
3	116	641	1463	0.080	116	0.1	2.875	A
4	307	467	1316	0.233	306	0.3	3.721	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		333						
2	769	0	1509	0.510	768	1.1	5.123	A
3	139	768	1380	0.101	139	0.1	3.119	A
4	367	560	1260	0.291	366	0.4	4.210	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		407						
2	942	0	1509	0.625	940	1.7	6.647	A
3	170	940	1269	0.134	170	0.2	3.524	A
4	449	685	1184	0.379	448	0.6	5.111	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		408						
2	942	0	1509	0.625	942	1.7	6.705	A
3	170	942	1267	0.134	170	0.2	3.529	A
4	449	686	1183	0.380	449	0.6	5.128	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		334						
2	769	0	1509	0.510	772	1.1	5.174	A
3	139	772	1378	0.101	139	0.1	3.128	A
4	367	562	1259	0.292	368	0.4	4.231	A

09:15 - 09:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		279						
2	644	0	1509	0.427	646	0.8	4.410	A

3	116	646	1460	0.080	117	0.1	2.884	A
4	307	470	1314	0.234	308	0.3	3.740	A

2040, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	J16 Ashford- Western Roundabout	Standard Roundabout		1, 2, 3, 4	5.23	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	5.23	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D8	2040	PM	ONE HOUR	17:00	18:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1				
2		✓	792	100.000
3		✓	90	100.000
4		✓	397	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	0	0	0
	2	422	0	0	370
	3	0	27	0	63
	4	48	349	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	4	0	0	4
	3	0	37	0	2
	4	9	4	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1				
2	0.58	5.89	1.4	A
3	0.08	3.26	0.1	A
4	0.34	4.36	0.5	A

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		282						
2	596	0	1509	0.395	594	0.7	4.083	A
3	67	594	1494	0.045	67	0.1	2.775	A
4	299	336	1395	0.214	298	0.3	3.420	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		337						
2	712	0	1509	0.472	711	0.9	4.691	A
3	80	711	1417	0.057	80	0.1	2.960	A
4	357	403	1355	0.264	357	0.4	3.763	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		413						
2	872	0	1509	0.578	870	1.4	5.851	A
3	99	870	1314	0.075	98	0.1	3.256	A
4	437	493	1300	0.336	437	0.5	4.347	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		413						
2	872	0	1509	0.578	872	1.4	5.885	A
3	99	872	1313	0.075	99	0.1	3.260	A
4	437	494	1300	0.336	437	0.5	4.356	A

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		338						
2	712	0	1509	0.472	714	0.9	4.725	A
3	80	714	1415	0.057	81	0.1	2.967	A
4	357	405	1354	0.264	358	0.4	3.774	A

18:15 - 18:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		283						
2	596	0	1509	0.395	598	0.7	4.116	A

3	67	598	1491	0.045	67	0.1	2.782	A
4	299	338	1394	0.214	299	0.3	3.432	A

2025 (With P&R Dev), AM

Data Errors and Warnings
No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	J16 Ashford- Western Roundabout	Standard Roundabout		1, 2, 3, 4	5.97	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	5.97	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D9	2025 (With P&R Dev)	AM	ONE HOUR	08:00	09:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1				
2		✓	862	100.000
3		✓	194	100.000
4		✓	426	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	0	0	0
	2	584	0	0	278
	3	7	31	0	156
	4	74	352	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	6	0	0	7
	3	0	7	0	8

	4	7	6	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1				
2	0.63	6.81	1.8	A
3	0.17	3.67	0.2	A
4	0.40	5.32	0.7	A

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		287						
2	649	0	1509	0.430	646	0.8	4.405	A
3	146	646	1460	0.100	145	0.1	2.934	A
4	321	466	1317	0.243	319	0.3	3.814	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		343						
2	775	0	1509	0.514	773	1.1	5.181	A
3	174	773	1377	0.126	174	0.2	3.205	A
4	383	558	1261	0.304	382	0.5	4.334	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		420						
2	949	0	1509	0.629	946	1.8	6.749	A
3	213	946	1265	0.168	213	0.2	3.666	A
4	469	682	1186	0.395	468	0.7	5.303	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		421						
2	949	0	1509	0.629	949	1.8	6.811	A
3	213	949	1263	0.169	213	0.2	3.672	A
4	469	684	1185	0.396	469	0.7	5.324	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		344						
2	775	0	1509	0.514	777	1.1	5.234	A
3	174	777	1374	0.127	174	0.2	3.216	A
4	383	560	1260	0.304	384	0.5	4.356	A

09:15 - 09:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service

1		288						
2	649	0	1509	0.430	650	0.8	4.451	A
3	146	650	1457	0.100	146	0.1	2.943	A
4	321	469	1315	0.244	321	0.3	3.837	A

2025 (With P&R Dev), PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	J16 Ashford- Western Roundabout	Standard Roundabout		1, 2, 3, 4	5.32	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	5.32	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D10	2025 (With P&R Dev)	PM	ONE HOUR	17:00	18:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1				
2		✓	796	100.000
3		✓	99	100.000
4		✓	448	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	0	0	0
	2	420	0	0	376
	3	0	27	0	72
	4	52	396	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	4	0	0	5
	3	0	37	0	3

	4	13	4	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1				
2	0.58	5.94	1.4	A
3	0.08	3.30	0.1	A
4	0.38	4.67	0.6	A

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		317						
2	599	0	1509	0.397	597	0.7	4.106	A
3	74	597	1492	0.050	74	0.1	2.799	A
4	337	335	1396	0.241	336	0.3	3.553	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		379						
2	716	0	1509	0.474	715	0.9	4.725	A
3	89	715	1415	0.063	89	0.1	2.991	A
4	403	401	1356	0.297	402	0.4	3.953	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		464						
2	877	0	1509	0.581	875	1.4	5.904	A
3	109	875	1311	0.083	108	0.1	3.299	A
4	493	491	1302	0.379	492	0.6	4.658	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		465						
2	877	0	1509	0.581	877	1.4	5.942	A
3	109	877	1310	0.083	109	0.1	3.302	A
4	493	492	1301	0.379	493	0.6	4.669	A

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		380						
2	716	0	1509	0.474	718	1.0	4.759	A
3	89	718	1413	0.063	89	0.1	2.996	A
4	403	403	1355	0.297	403	0.4	3.967	A

18:15 - 18:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service

1		318						
2	599	0	1509	0.397	601	0.7	4.141	A
3	74	601	1489	0.050	74	0.1	2.804	A
4	337	337	1395	0.242	338	0.3	3.571	A

2030 (With P&R Dev), AM

Data Errors and Warnings
No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	J16 Ashford- Western Roundabout	Standard Roundabout		1, 2, 3, 4	5.96	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	5.96	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D11	2030 (With P&R Dev)	AM	ONE HOUR	08:00	09:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1				
2		✓	862	100.000
3		✓	209	100.000
4		✓	428	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	0	0	0
	2	584	0	0	278
	3	7	31	0	171
	4	74	354	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	6	0	0	7
	3	0	7	0	7

	4	7	6	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1				
2	0.63	6.81	1.8	A
3	0.18	3.71	0.2	A
4	0.40	5.34	0.7	A

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		288						
2	649	0	1509	0.430	646	0.8	4.405	A
3	157	646	1460	0.108	156	0.1	2.942	A
4	323	466	1317	0.245	321	0.3	3.821	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		346						
2	775	0	1509	0.514	773	1.1	5.181	A
3	187	773	1377	0.136	187	0.2	3.225	A
4	385	558	1261	0.305	385	0.5	4.345	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		423						
2	949	0	1509	0.629	946	1.8	6.749	A
3	230	946	1265	0.182	229	0.2	3.706	A
4	472	682	1186	0.398	471	0.7	5.324	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		424						
2	949	0	1509	0.629	949	1.8	6.811	A
3	230	949	1263	0.182	230	0.2	3.712	A
4	472	684	1185	0.398	472	0.7	5.344	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		347						
2	775	0	1509	0.514	777	1.1	5.234	A
3	187	777	1374	0.136	188	0.2	3.236	A
4	385	560	1260	0.306	386	0.5	4.366	A

09:15 - 09:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service

1		290						
2	649	0	1509	0.430	650	0.8	4.451	A
3	157	650	1457	0.108	157	0.1	2.951	A
4	323	469	1315	0.245	323	0.3	3.843	A

2030 (With P&R Dev), PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	J16 Ashford- Western Roundabout	Standard Roundabout		1, 2, 3, 4	5.34	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	5.34	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D12	2030 (With P&R Dev)	PM	ONE HOUR	17:00	18:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1				
2		✓	796	100.000
3		✓	101	100.000
4		✓	463	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	**2**	**3**	**4**
From	**1**	0	0	0	0
	2	420	0	0	376
	3	0	27	0	75
	4	52	410	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	**2**	**3**	**4**
From	**1**	0	0	0	0
	2	4	0	0	5
	3	0	37	0	3

	4	13	4	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1				
2	0.58	5.94	1.4	A
3	0.08	3.30	0.1	A
4	0.39	4.76	0.7	A

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		328						
2	599	0	1509	0.397	597	0.7	4.106	A
3	76	597	1492	0.051	76	0.1	2.795	A
4	348	335	1396	0.249	347	0.3	3.587	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		392						
2	716	0	1509	0.474	715	0.9	4.725	A
3	91	715	1415	0.064	91	0.1	2.989	A
4	416	401	1356	0.307	415	0.5	4.005	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		480						
2	877	0	1509	0.581	875	1.4	5.904	A
3	111	875	1311	0.085	111	0.1	3.298	A
4	509	491	1302	0.391	509	0.7	4.747	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		481						
2	877	0	1509	0.581	877	1.4	5.942	A
3	111	877	1310	0.085	111	0.1	3.302	A
4	509	492	1301	0.391	509	0.7	4.760	A

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		394						
2	716	0	1509	0.474	718	1.0	4.759	A
3	91	718	1413	0.064	91	0.1	2.993	A
4	416	403	1355	0.307	417	0.5	4.019	A

18:15 - 18:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service

1		329						
2	599	0	1509	0.397	601	0.7	4.141	A
3	76	601	1489	0.051	76	0.1	2.803	A
4	348	337	1395	0.250	349	0.4	3.603	A

2040 (With P&R Dev), AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	J16 Ashford- Western Roundabout	Standard Roundabout		1, 2, 3, 4	5.94	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	5.94	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D13	2040 (With P&R Dev)	AM	ONE HOUR	08:00	09:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1				
2		✓	862	100.000
3		✓	239	100.000
4		✓	433	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	**2**	**3**	**4**
From	**1**	0	0	0	0
	2	584	0	0	278
	3	7	31	0	201
	4	74	359	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	**2**	**3**	**4**
From	**1**	0	0	0	0
	2	6	0	0	7
	3	0	7	0	6

	4	7	6	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1				
2	0.63	6.81	1.8	A
3	0.21	3.80	0.3	A
4	0.40	5.38	0.7	A

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		292						
2	649	0	1509	0.430	646	0.8	4.405	A
3	180	646	1460	0.123	179	0.1	2.968	A
4	326	466	1317	0.248	325	0.3	3.832	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		350						
2	775	0	1509	0.514	773	1.1	5.181	A
3	214	773	1377	0.156	214	0.2	3.272	A
4	390	558	1261	0.309	389	0.5	4.364	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		428						
2	949	0	1509	0.629	946	1.8	6.749	A
3	263	946	1265	0.208	262	0.3	3.796	A
4	477	682	1186	0.402	476	0.7	5.360	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		429						
2	949	0	1509	0.629	949	1.8	6.811	A
3	263	949	1263	0.208	263	0.3	3.802	A
4	477	684	1185	0.403	477	0.7	5.381	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		351						
2	775	0	1509	0.514	777	1.1	5.234	A
3	214	777	1374	0.156	215	0.2	3.283	A
4	390	560	1260	0.309	391	0.5	4.385	A

09:15 - 09:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service

1		294						
2	649	0	1509	0.430	650	0.8	4.451	A
3	180	650	1457	0.123	180	0.1	2.978	A
4	326	469	1315	0.248	327	0.4	3.855	A

2040 (With P&R Dev), PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	J16 Ashford- Western Roundabout	Standard Roundabout		1, 2, 3, 4	5.39	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	5.39	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D14	2040 (With P&R Dev)	PM	ONE HOUR	17:00	18:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1				
2		✓	796	100.000
3		✓	106	100.000
4		✓	492	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	0	0	0
	2	420	0	0	376
	3	0	27	0	80
	4	52	440	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	4	0	0	5
	3	0	37	0	3

	4	13	4	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1				
2	0.58	5.94	1.4	A
3	0.09	3.30	0.1	A
4	0.42	4.95	0.7	A

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		350						
2	599	0	1509	0.397	597	0.7	4.106	A
3	80	597	1492	0.054	80	0.1	2.789	A
4	371	335	1396	0.265	369	0.4	3.653	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		419						
2	716	0	1509	0.474	715	0.9	4.725	A
3	95	715	1415	0.067	95	0.1	2.984	A
4	442	401	1356	0.326	442	0.5	4.108	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		513						
2	877	0	1509	0.581	875	1.4	5.904	A
3	117	875	1311	0.089	117	0.1	3.297	A
4	542	491	1302	0.416	541	0.7	4.933	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		514						
2	877	0	1509	0.581	877	1.4	5.942	A
3	117	877	1310	0.089	117	0.1	3.301	A
4	542	492	1301	0.416	542	0.7	4.948	A

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1		420						
2	716	0	1509	0.474	718	1.0	4.759	A
3	95	718	1413	0.067	95	0.1	2.991	A
4	442	403	1355	0.326	443	0.5	4.124	A

18:15 - 18:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service

1		352						
2	599	0	1509	0.397	601	0.7	4.141	A
3	80	601	1489	0.054	80	0.1	2.795	A
4	371	337	1395	0.266	371	0.4	3.673	A

Junctions 10

PICADY 10 - Priority Intersection Module

Version: 10.0.4.1693

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Filename: Junction 2 - Access to P&R.j10
Path: Q:\2020 Jobs\20_008L Ashford Rathnew\Traffic Study
Report generation date: 25/07/2023 09:21:29

Summary of junction performance

	AM					PM				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
	2025									
Stream B-AC	D1	0.1	10.67	0.03	B	D2	0.1	7.76	0.09	A
Stream C-AB		0.1	10.02	0.10	B		0.1	11.15	0.03	B
	2030									
Stream B-AC	D3	0.1	10.10	0.04	B	D4	0.2	7.76	0.12	A
Stream C-AB		0.2	9.78	0.13	A		0.1	10.67	0.04	B
	2040									
Stream B-AC	D5	0.1	9.45	0.05	A	D6	0.2	7.99	0.18	A
Stream C-AB		0.3	10.01	0.20	B		0.1	10.05	0.05	B

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

File summary

File Description

Title	
Location	
Site number	
Date	25/04/2023
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	DOMAIN\jyotsna.singh
Description	

Units

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

Analysis Options

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

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2025	AM	ONE HOUR	08:15	09:45	15
D2	2025	PM	ONE HOUR	16:15	17:45	15
D3	2030	AM	ONE HOUR	08:15	09:45	15
D4	2030	PM	ONE HOUR	16:15	17:45	15
D5	2040	AM	ONE HOUR	08:15	09:45	15
D6	2040	PM	ONE HOUR	16:15	17:45	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

2025, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	Two-way	Two-way		0.75	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	0.75	A

Arms

Arms

Arm	Name	Description	Arm type
A	untitled		Major
B	untitled		Minor
C	untitled		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right-turn storage	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	6.00	✓	3.03		70.0	✓	7.50

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

Minor Arm Geometry

Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
B	One lane	4.00	35	40

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B-A	597	0.102	0.258	0.162	0.368
B-C	714	0.109	0.277	-	-
C-B	615	0.238	0.238	-	-

The slopes and intercepts shown above include custom intercept adjustments only.
Streams may be combined, in which case capacity will be adjusted.
Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2025	AM	ONE HOUR	08:15	09:45	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	426	100.000
B		✓	18	100.000
C		✓	434	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	0	426
	B	0	0	18
	C	387	47	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	8
	B	0	0	67
	C	10	26	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.03	10.67	0.1	B
C-AB	0.10	10.02	0.1	B
C-A				
A-B				
A-C				

Main Results for each time segment

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	13	625	0.021	13	0.0	9.847	A
C-AB	35	538	0.065	35	0.1	8.980	A
C-A	291			291			
A-B	0			0			
A-C	321			321			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	16	608	0.026	16	0.0	10.181	B
C-AB	42	523	0.080	42	0.1	9.395	A

C-A	348			348			
A-B	0			0			
A-C	383			383			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	20	584	0.034	20	0.1	10.675	B
C-AB	52	503	0.102	51	0.1	10.015	B
C-A	426			426			
A-B	0			0			
A-C	469			469			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	20	584	0.034	20	0.1	10.675	B
C-AB	52	503	0.102	52	0.1	10.021	B
C-A	426			426			
A-B	0			0			
A-C	469			469			

09:15 - 09:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	16	608	0.026	16	0.0	10.185	B
C-AB	42	523	0.080	42	0.1	9.402	A
C-A	348			348			
A-B	0			0			
A-C	383			383			

09:30 - 09:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	13	625	0.021	13	0.0	9.854	A
C-AB	35	538	0.065	35	0.1	8.998	A
C-A	291			291			
A-B	0			0			
A-C	321			321			

2025, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	Two-way	Two-way		0.63	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	0.63	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2025	PM	ONE HOUR	16:15	17:45	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	397	100.000
B		✓	51	100.000
C		✓	448	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	0	397
	B	0	0	51
	C	433	15	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	7
	B	0	0	16
	C	6	53	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.09	7.76	0.1	A
C-AB	0.03	11.15	0.1	B
C-A				
A-B				
A-C				

Main Results for each time segment

16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	38	631	0.060	38	0.1	7.023	A
C-AB	11	543	0.021	11	0.0	10.348	B
C-A	326			326			
A-B	0			0			
A-C	299			299			

16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	45	615	0.074	45	0.1	7.318	A
C-AB	14	529	0.026	14	0.0	10.674	B
C-A	389			389			
A-B	0			0			
A-C	357			357			

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	56	593	0.094	56	0.1	7.757	A
C-AB	17	510	0.033	17	0.1	11.153	B
C-A	477			477			
A-B	0			0			
A-C	437			437			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	56	593	0.094	56	0.1	7.760	A
C-AB	17	510	0.033	17	0.1	11.153	B
C-A	477			477			
A-B	0			0			
A-C	437			437			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	45	615	0.074	46	0.1	7.321	A
C-AB	14	529	0.026	14	0.0	10.678	B
C-A	389			389			
A-B	0			0			
A-C	357			357			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	38	631	0.060	38	0.1	7.033	A

C-AB	11	543	0.021	11	0.0	10.356	B
C-A	326			326			
A-B	0			0			
A-C	299			299			

2030, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	Two-way	Two-way		0.92	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	0.92	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D3	2030	AM	ONE HOUR	08:15	09:45	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	408	100.000
B		✓	20	100.000
C		✓	449	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	0	408
	B	0	0	20
	C	387	62	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	8
	B	0	0	59
	C	10	19	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.04	10.10	0.1	B
C-AB	0.13	9.78	0.2	A
C-A				
A-B				
A-C				

Main Results for each time segment

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	15	629	0.024	15	0.0	9.331	A
C-AB	47	541	0.086	46	0.1	8.672	A
C-A	291			291			
A-B	0			0			
A-C	307			307			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	18	612	0.030	18	0.0	9.640	A
C-AB	56	527	0.105	55	0.1	9.112	A
C-A	348			348			
A-B	0			0			
A-C	367			367			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	22	590	0.038	22	0.1	10.095	B
C-AB	68	508	0.134	68	0.2	9.774	A
C-A	426			426			
A-B	0			0			
A-C	449			449			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	22	590	0.038	22	0.1	10.097	B
C-AB	68	508	0.134	68	0.2	9.781	A
C-A	426			426			
A-B	0			0			
A-C	449			449			

09:15 - 09:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	18	612	0.030	18	0.0	9.642	A
C-AB	56	527	0.105	56	0.1	9.122	A
C-A	348			348			
A-B	0			0			
A-C	367			367			

09:30 - 09:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	15	629	0.024	15	0.0	9.337	A

C-AB	47	541	0.086	47	0.1	8.693	A
C-A	291			291			
A-B	0			0			
A-C	307			307			

2030, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	Two-way	Two-way		0.76	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	0.76	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D4	2030	PM	ONE HOUR	16:15	17:45	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	397	100.000
B		✓	65	100.000
C		✓	451	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	0	397
	B	0	0	65
	C	433	18	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	7
	B	0	0	12
	C	6	46	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.12	7.76	0.2	A
C-AB	0.04	10.67	0.1	B
C-A				
A-B				
A-C				

Main Results for each time segment

16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	49	631	0.078	49	0.1	6.934	A
C-AB	13	543	0.024	13	0.0	9.880	A
C-A	326			326			
A-B	0			0			
A-C	299			299			

16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	59	615	0.096	59	0.1	7.262	A
C-AB	16	529	0.030	16	0.0	10.199	B
C-A	389			389			
A-B	0			0			
A-C	357			357			

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	72	593	0.121	72	0.2	7.753	A
C-AB	19	510	0.038	19	0.1	10.668	B
C-A	477			477			
A-B	0			0			
A-C	437			437			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	72	593	0.121	72	0.2	7.756	A
C-AB	19	510	0.038	19	0.1	10.670	B
C-A	477			477			
A-B	0			0			
A-C	437			437			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	59	615	0.096	59	0.1	7.265	A
C-AB	16	529	0.030	16	0.0	10.203	B
C-A	389			389			
A-B	0			0			
A-C	357			357			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	49	631	0.078	49	0.1	6.944	A

C-AB	13	543	0.024	13	0.0	9.887	A
C-A	326			326			
A-B	0			0			
A-C	299			299			

2040, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	Two-way	Two-way		1.27	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	1.27	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D5	2040	AM	ONE HOUR	08:15	09:45	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	408	100.000
B		✓	25	100.000
C		✓	479	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	**B**	**C**
From	**A**	0	0	408
	B	0	0	25
	C	387	92	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	**B**	**C**
From	**A**	0	0	8
	B	0	0	47
	C	10	13	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.05	9.45	0.1	A
C-AB	0.20	10.01	0.3	B
C-A				
A-B				
A-C				

Main Results for each time segment

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	19	629	0.030	19	0.0	8.697	A
C-AB	69	541	0.128	68	0.2	8.595	A
C-A	291			291			
A-B	0			0			
A-C	307			307			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	23	612	0.037	23	0.1	9.001	A
C-AB	83	527	0.157	82	0.2	9.147	A
C-A	348			348			
A-B	0			0			
A-C	367			367			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	28	590	0.047	28	0.1	9.446	A
C-AB	101	508	0.199	101	0.3	10.000	B
C-A	426			426			
A-B	0			0			
A-C	449			449			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	28	590	0.047	28	0.1	9.448	A
C-AB	101	508	0.199	101	0.3	10.014	B
C-A	426			426			
A-B	0			0			
A-C	449			449			

09:15 - 09:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	23	612	0.037	23	0.1	9.002	A
C-AB	83	527	0.157	83	0.2	9.167	A
C-A	348			348			
A-B	0			0			
A-C	367			367			

09:30 - 09:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	19	629	0.030	19	0.0	8.704	A

C-AB	69	541	0.128	69	0.2	8.626	A
C-A	291			291			
A-B	0			0			
A-C	307			307			

2040, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	Two-way	Two-way		1.04	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	1.04	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D6	2040	PM	ONE HOUR	16:15	17:45	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	397	100.000
B		✓	95	100.000
C		✓	456	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	0	397
	B	0	0	95
	C	433	23	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	7
	B	0	0	8
	C	6	36	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.18	7.99	0.2	A
C-AB	0.05	10.05	0.1	B
C-A				
A-B				
A-C				

Main Results for each time segment

16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	72	631	0.113	71	0.1	6.962	A
C-AB	17	543	0.031	17	0.0	9.265	A
C-A	326			326			
A-B	0			0			
A-C	299			299			

16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	85	615	0.139	85	0.2	7.365	A
C-AB	20	529	0.038	20	0.1	9.582	A
C-A	389			389			
A-B	0			0			
A-C	357			357			

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	105	593	0.176	104	0.2	7.986	A
C-AB	25	510	0.049	25	0.1	10.046	B
C-A	477			477			
A-B	0			0			
A-C	437			437			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	105	593	0.176	105	0.2	7.993	A
C-AB	25	510	0.049	25	0.1	10.048	B
C-A	477			477			
A-B	0			0			
A-C	437			437			

17:15 - 17:30

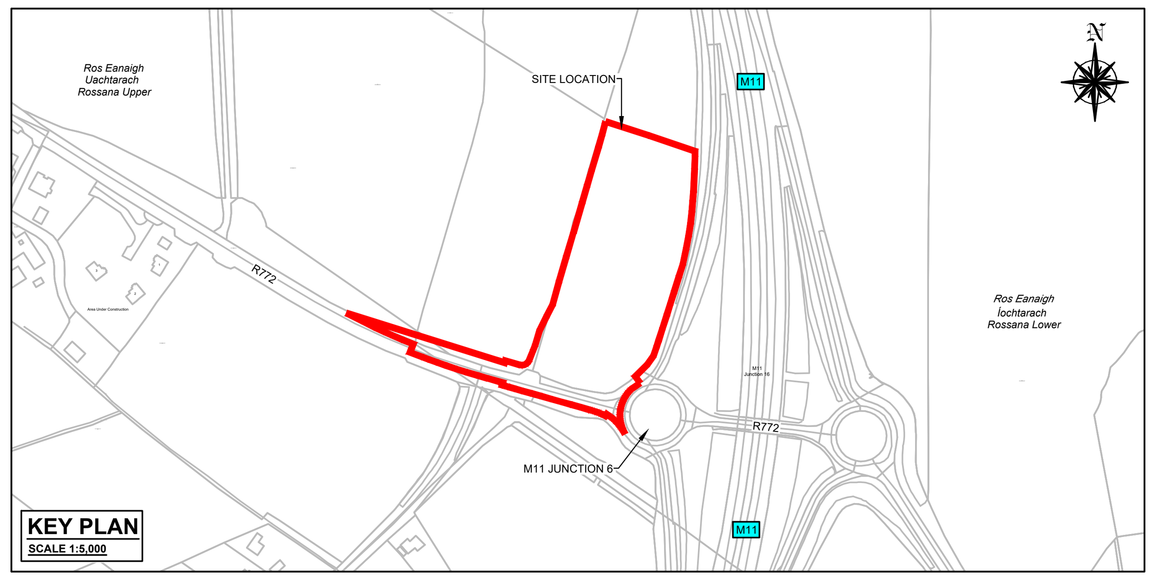
Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	85	615	0.139	86	0.2	7.376	A
C-AB	20	529	0.038	20	0.1	9.584	A
C-A	389			389			
A-B	0			0			
A-C	357			357			

17:30 - 17:45

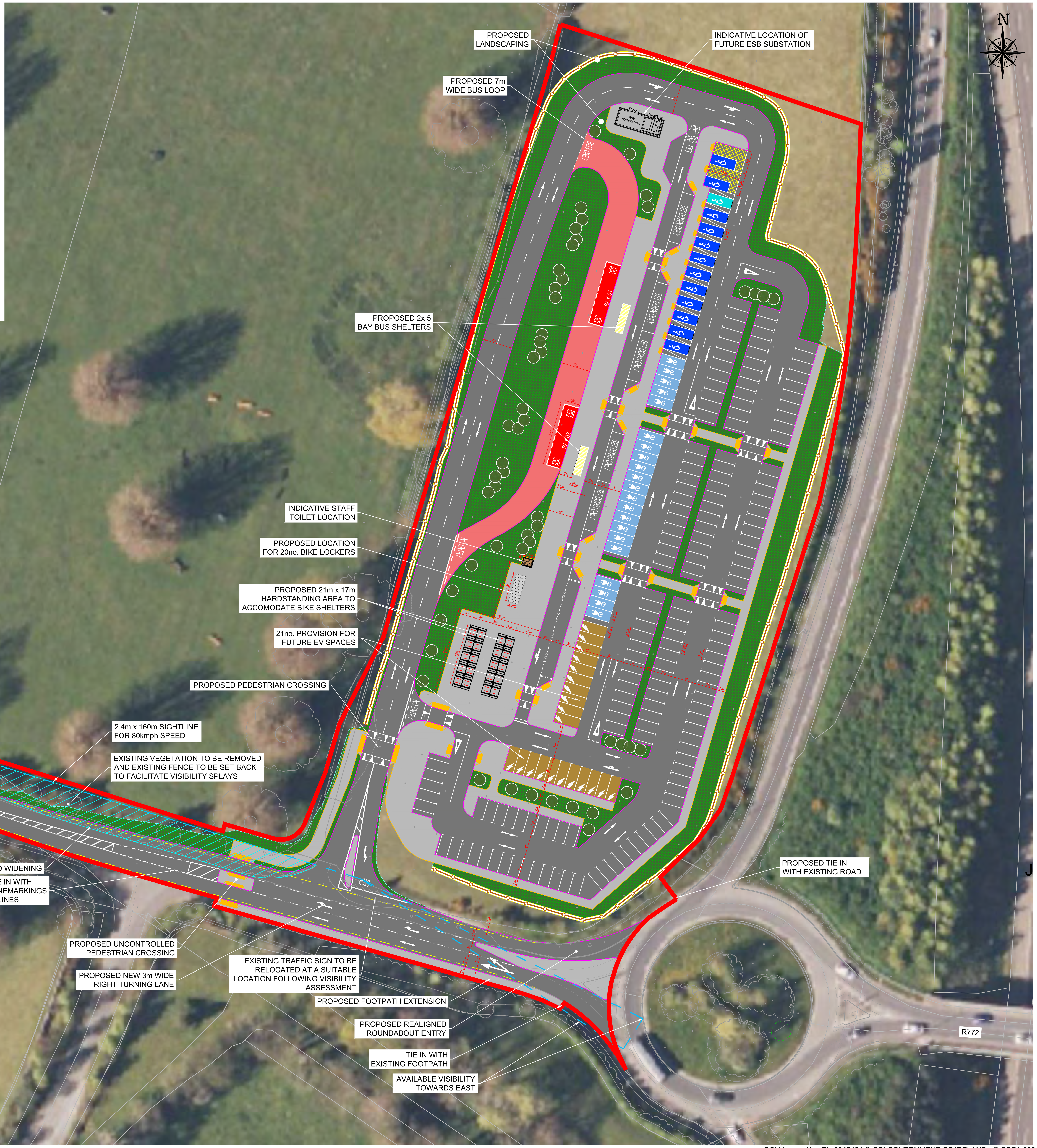
Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	72	631	0.113	72	0.1	6.980	A

C-AB	17	543	0.031	17	0.0	9.272	A
C-A	326			326			
A-B	0			0			
A-C	299			299			

Appendix C: Masterplan for the Ashford Park and Ride Site



ASHFORD RATHNEW				
TOTAL SPACES	210	%	SIZE	BUFFER
Standard	155	73.81%	5x2.5m	(no buffer)
Disabled (Standard & EV)	11	5.12%	6x2.4m	(1.2m buffer)
Disabled (Large)	2	0.95%	7.8x5.4m	
EV Charging (Pemanent)	21	10.00%	6x2.5m	(no buffer)
EV Future	21	10.00%	6x2.5m	(no buffer)



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A1

Tionscadal Éireann
Project Ireland 2040

LEGEND:

- PLANNING APPLICATION BOUNDARY
- PROPOSED CARRAIGEWAY EDGE
- PROPOSED KERB EDGING
- PROPOSED 1.35m TIMBER POST & RAIL FENCING
- PROPOSED ACCESS ROAD & CARPARK
- PROPOSED FOOTPATH
- PROPOSED HARDSTANDING AREA
- PROPOSED LANDSCAPING/PLANTING
- PROPOSED BUS LOOP
- PROPOSED BUS BAYS
- PROPOSED STANDARD MID SPACES (10no.)
- PROPOSED LARGE MID SPACES (2no.)
- PROPOSED EV MID SPACES (1no.)
- PROPOSED EV CHARGING SPACES (21no.)
- PROPOSED FUTURE EV CHARGING SPACES (21no.)
- PROPOSED PLANTS/TREES

Rev	Description	Drawn	Checked	Date
P04	ISSUED FOR PLANNING	SM	IR	25/10/24

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Client: WICKLOW COUNTY COUNCIL

Project: ASHFORD PARK AND RIDE FACILITY

Dwg. Title: GENERAL ARRANGMENT LAYOUT PLAN

Drawn By: SM | Date: FEB 2024 | CSEA Job No.: 20_008L

Checked By: IR | Scale: 1:500 @ A1

Project Code	Originator	Zone/ Phase	Level	Type	Role	Dwg. No.
20_008L	CSE	GEN	XX	DR	C	2200

20_008L - CSE - GEN - XX - DR - C - 2200

Status Code: S02 | Suitability Description: PART VIII APPROVAL

Revision: P04 | Project Status: FOR PLANNING

Appendix D: Committed Development Trip Generation

PUNCH
consulting engineers

192234 - Ashford Lands, Housing Development, Wicklow

Traffic and Transport Assessment

February 2021

Document Control

Document Number: 192234-TTA-PL0

Revision	Description	Date	Prepared	Checked	Approved
PR0	Planning Issue	11/02/2021	Joshua Martin	Julie Tiernan	Paul Casey

Table of Contents

1 Non-Technical Summary

i. The Strategic Housing Development (SHD) will consist of 117 no. dwellings comprising 99 no. 2-4 bed houses (1- 2 storey) and a 3-storey block of 18 no., 2 & 3 bed duplex apartments. Provision of a creche, bin and bicycle storage, parking, open spaces, pump station and connection to the public road and footpath network via the adjoining Rossana Close / Woodview / Aishleigh estate road. All associated site development, landscaping, boundary treatments, and services connections.

ii. It is proposed to access the proposed development via the existing residential development Roassana Close.

iii. For the purposes of our assessment, the TRICS database was consulted to provide an equivalent trip rate for the proposed type of development.

iv. The proposed development traffic flows generated are below the threshold set by TII for the preparation of a TTA. However, capacity analysis was carried out on 4 existing junctions surrounding the proposed development. The analysis shows that the surrounding road network and adjacent existing junctions will have sufficient operational capacity to accept the development traffic up to the Design Year 2038 and beyond.

v. The existing road system is expected to experience negligible impact from the proposed development.

2 Introduction

PUNCH Consulting Engineers were appointed to prepare a Traffic and Transport Assessment for a site located in Ashford, Co. Wicklow.

This assessment is generally undertaken in accordance with the TII's Traffic and Transport Assessment Guidelines (May 2014) and makes reference to the Design Manual for Urban Roads & Streets (DMURS) and Smarter Travel - A Sustainable Transport Future (2009 - 2020). Sections from the Wicklow Council Development Plan (2016 - 2022) have been used to help describe the development location and its local context.

The proposed development size is below thresholds set by Transport Infrastructure Ireland (TII) for the requirements of a Traffic and Transport Assessment (TTA) as per Section 2 of the Traffic and Transport Assessment Guidelines May 2014. Although not strictly required, this TTA is included with the planning documentation for the proposed development to offer reassurance of the minimal impact the additional traffic loading will have on the surrounding road network.

The purpose of the report is to assess the potential impact of the proposed development on the existing local transport network and to ensure that the proposed site access and the existing junctions, which fall within the scope of the study, will have adequate capacity to carry the development traffic and the future growth in existing road traffic to the design year and beyond. An assessment of the accessibility of the site for cyclists, pedestrians, and public transport users has also been made.

2.1 Existing Site & Site location

The site is located on lands within Ashford, Co. Wicklow. The proposed development is bounded by existing residential buildings to the west and by greenfield sites to the north, east and south. The site location in relation to the wider road network is detailed in Figure 2-1.

Figure 2-1: Development Site Location Map and Surrounding Road Network

The existing site is approximately 3.8 hectares and is currently a greenfield site.

There is an existing vehicular access to the site through the existing housing development. Woodview Road provides access to Rossana Close which provides direct access to the site but currently hoarding is in place across the existing site entrance.

The proposed development site falls within the boundary of the Wicklow Council Development Plan (2016 - 2022). Parking standards are set out in the Wicklow Council Development Plan (2016 - 2022).

2.2 Local Road Network

The layout of the local road network is presented in Figure 2-2. The surrounding area is residential in nature. Approximately 212 dwellings exist in the vicinity of the proposed development and currently utilise the existing road network.

A brief description of the local road network is provided below. The roads in the vicinity described below have a speed limits between 50 - 80 km/hr and are illuminated by public lighting. This report is based on the proposed development's use on a standard day between 7:00 to 23:30. The roads are described therefore within this context.

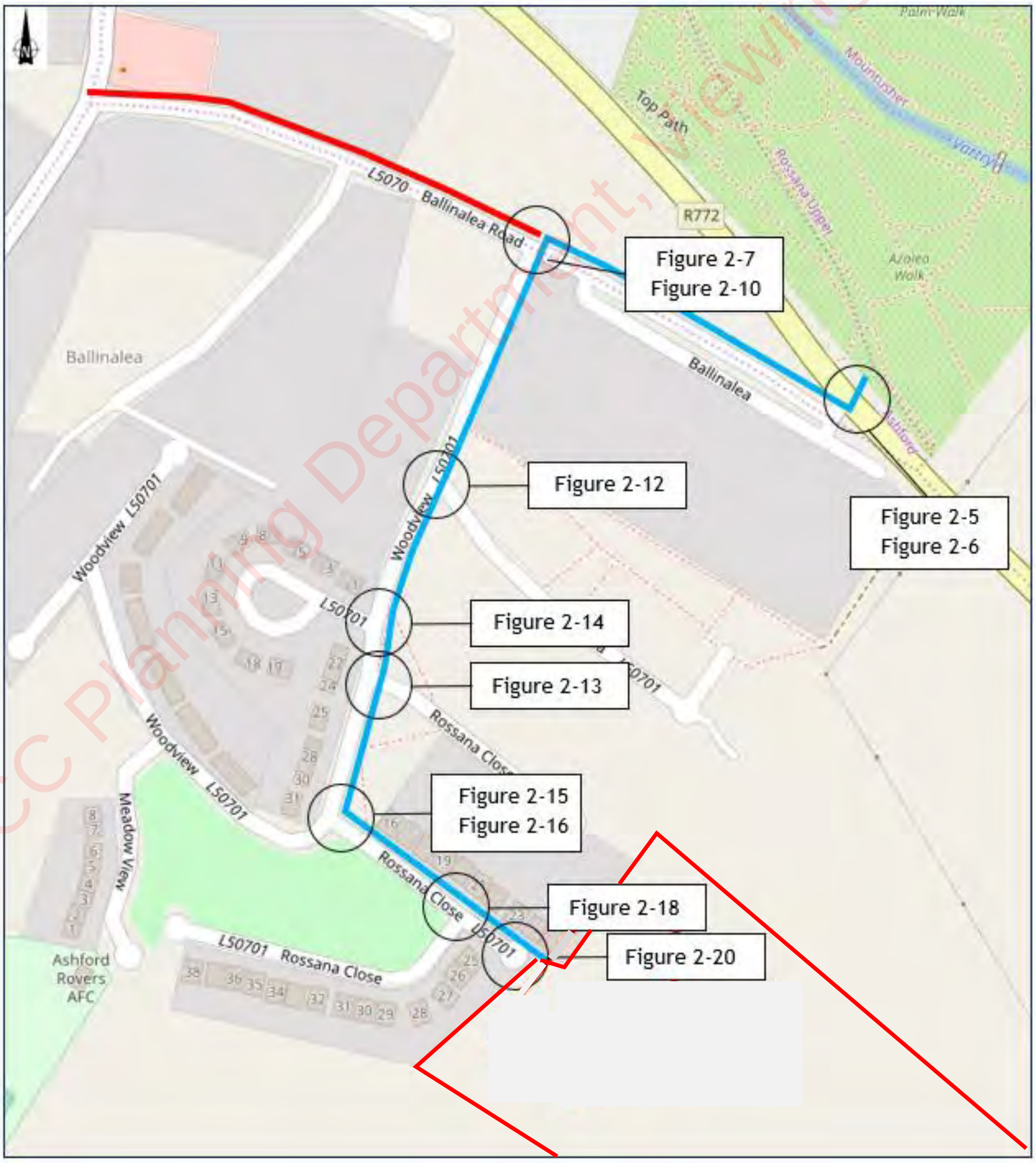


Figure 2-2: Development Site Location Map and Surrounding Road Network

2.2.1 R772

The R772 is the main link road between Junction 16 of the M11 and Ashford. Refer to Figure 2-4 and Figure 2-5 for pictures of the junctions. The R772 is a single lane two-way carriageway with a footpath on one side of the carriageway and no existing designated cycle lanes. See Figure 2-3 for the typical carriageway cross section. The speed limit varies along the road from 80km/h - 60km/h - 50km/h.

Figure 2-3: R772 (Looking North West) © Google Maps

Figure 2-4: R772 Roundabout junction with M11 Junction 16 (Looking South East) © Google Maps

Figure 2-5: R772 Existing Development Entrance (Site1), Ashford Downs (Looking North West) © Google Maps

2.2.2 Ashford Downs

Ashford Downs is a residential road which is accessed by the R772 to the east and by Chestnut Glen to the west. It is located to the north of the proposed development. Ashford Downs is an unmarked road which operates as a single lane two-way carriageway with a footpath on one side of the carriageway and no existing designated cycle lanes. It has residential development either side and forms a section of the access route to the development site. It has a spend limit of 50km/h. Refer to Figure 2-6 and Figure 2-7 below for images of the road.

Figure 2-6: Ashford Downs (Looking West onto the R772 junction)

Figure 2-7: Ashford Downs (Looking West) © Google Maps

2.2.3 Chestnut Glen

Chestnut Glen runs north-south and provides access onto Ashford Downs to the easst. The road continues north and merges with the R772. There is residential development on both sides of the road. Chestnut Glen Road is a single lane two-way carriageway with a narrow footpath on one side of the carriageway and no existing designated cycle lanes. Refer to Figure 2-8 and Figure 2-9 for pictures of the road layout.

Figure 2-8: Chestnut Glen junction with Ashford Downs (Site 2) (Looking West)

Figure 2-9: Chestnut Glen junction with Ashford Downs (Site2) (Looking South)

2.2.4 Aishleigh Road

Aishleigh Road runs north-south and links Ashford Downs with Woodview Road to the south. There is residential development on either side for the majority of the road. Ashleigh is a single lane two-way carriageway with narrow footpaths on both sides of the carriageway and no existing designated cycle lanes. Refer to Figure 2-10, Figure 2-11 for pictures of the road layout. Figure 2-12 shows a turn off into a residential street, at this point the road name changes from Aishleigh to Woodview

Figure 2-10: Junction between Ashleigh and Ashford Downs (Site 3) (looking North)

Figure 2-11: Aishleigh (Looking North)

Figure 2-12: Aishleigh merge with Woodview (Looking South) © Google Maps

2.2.5 Woodview Road

Woodview Road runs north-south and links Aishleigh Road with the site access road (unnamed) to the south. There is residential development on either side for the majority of the road. Woodview Road is a single lane two-way carriageway with narrow footpaths on both sides of the carriageway and no existing designated cycle lanes. Refer to Figure 2-13 to Figure 2-15 for the junctions along the road.

Figure 2-13: Woodview junction with Rossana Close (Looking South-East) © Google Maps

Figure 2-14: Woodview junction with housing cul-de-sac (Looking North-West)

Figure 2-15: End of Woodview junction with site access road (Site 4) (Looking South) © Google Maps

2.2.6 Site Access Road

The site access road is a single lane, 2 way residential road with a footpath on one side and no dedicated cycle lanes. One side has residential properties while other is a green field. Refer to Figure 2-16 for the road junction with Woodview. And Figure 2-17 to Figure 2-20 for photos of the road.

Figure 2-16: Site access road (Site 4) (Looking North-West)

Figure 2-17: Site access road looking towards the site entrance (Looking South-East)

Figure 2-18: Branch-off site access road (looking South-West)

Figure 2-19: Site access road (Looking North-West)

Figure 2-20: Site Entrance (Looking South-East)

2.3 Development Plan Requirements

The Wicklow County Development Plan 2016 - 2022 was reviewed to determine the requirements for the development in relation to roads and access. The following extracts have been included in this report for reference.

2.3.1 Development Design Standards

Extracts from: Volume 3 - Appendix 1 - Development Design Standards - p50 Section 7

Regional road development control objectives

1. Works carried out on regional roads shall generally comply with NRA 'Design Manual for Roads & Bridges' or DMURS (whichever is applicable) as may be amended and revised, unless local conditions determine otherwise.

2. A new means of access onto a regional road will be strictly controlled and may be considered if one of the following circumstances applies:

- *the regional road passes through a designated settlement and a speed limit of 50km/h or less applies;*
- *where the new access is intended to replace an existing deficient one;*[7]
- *where it is demonstrated that the entrance is essential and no other means of access is available.*

3. Permission will generally not be considered for new development adjoining the regional road even where no vehicular access is created because hazardous situations often still arise due to unregulated parking and the opening of pedestrian routes.

2.3.2 Wicklow Development Plan

These extracts have been included for reference.

Extracts from: Chapter 9

General Road Objectives

TR15 Traffic Impact Assessments will be required for new developments in accordance with the thresholds set out in the 'Design Manual for Roads and Bridges' the 'Traffic & Transport Assessment Guidelines' (TII) and the Design Manual for Urban Roads and Streets (DoECLG & DoTTS).

TR21 To safeguard the capacity and safety of the National Road network by restricting further access onto National Primary and National Secondary roads in line with the provisions of the 'Spatial Planning and National Roads' Guidelines' (DoECLG 2012). In particular, a new means of access onto a national road shall adhere to the following:

(a) Lands adjoining National Roads to which speed limits greater than 60kmh apply: The creation of any additional access point from new development or the generation of increased traffic from existing accesses to national roads to which speed limits greater than 60kmh apply shall generally be avoided. This provision applies to all categories of development, including individual houses in rural areas, regardless of the housing circumstances of the applicant.

(b) Transitional Zones: These are areas where sections of national roads form the approaches to or exit from urban centres that are subject to a speed limit of 60kmh before a lower 50kmh limit is encountered. Direct access onto such road may be allowed in limited circumstances, in order to facilitate orderly urban development. Any such proposal must, however, be subject to a road safety audit carried out in accordance with the TII's requirements and a proliferation of such entrances, which would lead to a diminution in the role of such zones, shall be avoided.

(c) Lands adjoining National Roads within 50kmh speed limits: Access to national roads will be considered by the Planning Authority in accordance with normal road safety, traffic management and urban design criteria for built up areas.

TR27 New means of access onto regional roads will be strictly controlled and may be considered if one of the following circumstances applies:

- *The regional road passes through a designated settlement and a speed limit of 50km/h or less applies;*
- *where the new access is intended to replace an existing deficient one;*
- *where it is demonstrated that the entrance is essential and no other means of access is available*

TR30 To require all new or improved urban local roads to make provision for public lighting, foot and cycleways and bus stop facilities, where deemed appropriate by the Local Authority.

TR32 Where a proposed development is adjoining future development lands or provides the only possible access route to other lands, new roads will be required to be designed to ensure that future access to other lands can be facilitated.

TR35 New / expanded developments shall be accompanied by appropriate car parking provision, with particular regard being taken of the potential to reduce private car use in locations where public transport and parking enforcement are available. At such locations, the car parking standards set out in Appendix 1 Table 7.1 shall be taken as maximum standards, and such a quantum of car parking will only be permitted where it can be justified. (see Figure 2-1)

TR36 Provision shall be made in all new / expanded developments for disabled parking (and associated facilities such as signage, dished kerbs etc), at a suitable and convenient location for users.

Use Class	Parking spaces to be provided
Theatre, Cinema, Stadium	0.33 per seat
Church	0.33 per seat
Nursing Homes	0.5 per bed
Third Level Colleges	0.5 per student
Hotel (excl function room)	1 per bedroom
School (primary)	1.2 per classroom
School (secondary)	2.0 per classroom
Hospital	1.5 per bed
Clinics / Medical Practices	2 per consultant
Dwelling	1-2 per unit[8]
Warehousing	1 per 100 m^2 gross floor area
Retail Warehousing, Factory/Outlet/Garden Centres	2 per 100 m^2 gross floor area
Library	3 per 100 m^2 gross floor area
Manufacturing	3 per 100 m^2 gross floor area
Offices (ground floor)	5 per 100 m^2 gross floor area
Offices (above ground floor)	4 per 100 m^2 gross floor area
Bank or Financial Institution	7 per 100 m^2 gross floor area
Restaurant dining room	10 per 100 m^2 gross floor area
Bar, Lounges, Function Rooms	10 per 100 m^2 gross floor area
Childcare facilities	0.5 spaces per staff member + 1 car parking space per 10 children
Allotments	1 space per plot in areas located outside towns or villages[9]
Out of town/regional shopping centres	6 per 100sqm floor area
Other retail (town/village, district/neighbourhood centre, large foodstore)	4 per 100sqm floor area Large foodstores: 'food retail' (1 space per $14m^2$), 'non food retail' (1 space per $20m^2$)

[8] Refer to Section 1 for further guidance
[9] Within towns or villages a relaxation of this standard shall apply on a case by case basis.

Figure 2-1: WCC Parking Standards

2.3.3 Summary Development Plan Impacts

1. The development will utilise the existing residential development access with the R772 due to the development requirements outlined below which require that "*new accesses to national roads to which* speed limits greater than 60kmh apply shall generally be avoided.".
2. WCC Car Parking standards will be applied to the site development

2.4 Ashford Town Proposals

The Ashford Town 2016-2022 has general proposals for the town which have been included below. The objectives are broad but ASH10 refers to the R772, it is unlikely that this will have an impact on the proposed development due to the location of the R764.

Extracts from the Ashford Town Plan 2016-2022
Service Infrastructure Objectives

> *ASH10 To provide for a new through road linking the R764 to the R772 (old N11) through and serving employment lands designated as Action Area 3.*
>
> *ASH11 To improve / provide new footpaths, cycleways and traffic calming on existing roads where required and to require the provision of new link roads, footpaths and cycleways as specified in this plan in 'Action Areas' and 'Specific Local Objective' areas.*

The Plan also lists the site as being within an area of lands which are specifically zoned for residential development. This can be seen in the extract below and in Figure 2-21:

> *Action Area 1*
>
> *This Action Area is situated at Ballinalea and comprises of c. 11.5ha of lands, zoned for residential development (c. 7.7ha) and Active Open Space (c. 3.8ha) as shown on Figure 2. Access to the AOS lands shall be provided through the residential land from the R772. Only 50% of the proposed residential element may be developed prior to the AOS lands being levelled and drained suitable for sports use and devoted to an agreed sports body.*

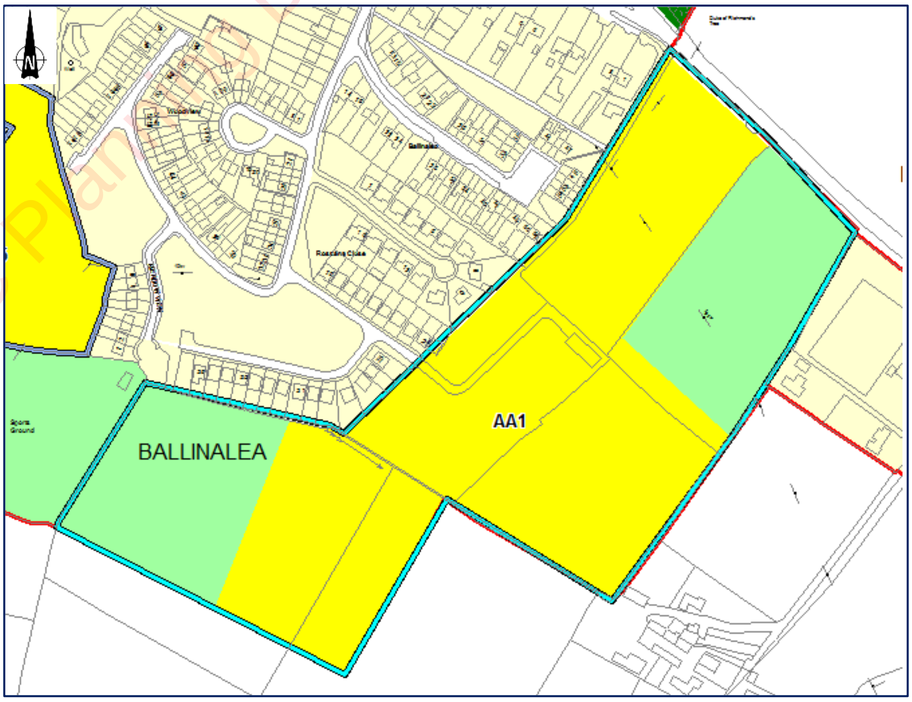


Figure 2-21: Action Area 1 from the Ashford Town Plan 2016-2022

2.5 Planning Application Review

The surrounding area was reviewed for relevant planning applications to determine the recent relevant conditions set by the council and to determine if similar developments have been approved in recent years. Applications within the Ashford area were generally related to construction of single dwellings or alterations to existing dwelling and none are considered to have a potential significant impact on this traffic assessment.

2.6 Cycle Routes

There are no dedicated cycle lanes in the immediate vicinity of the site along the residential access roads or along the R772.

2.7 Public Transport

The site of the proposed development is served by public transport; buses along the R772 and a train station in Wicklow Town Centre circa 5km away.

2.8 Existing Traffic Flows

Traffic Surveys of the existing surrounding junctions in the neighbourhood were carried out by IDASO Limited on Tuesday 30th June 2020. The locations of the Junction Turning Counts are presented in Figure 2-22 below and full traffic survey results are included Appendix A.

Site 1 - R772 and Ashford Downs
Site 2 - Chestnut Glen and Ashford Downs
Site 3 - Ashford Downs and Ashleigh
Site 4 - Woodview and Unnamed Road

Figure 2-22: Junction Turning Count locations

The survey recorded PCL (Pedal Cycles), MCL (2 Wheeled Motorcycles), Cars, LGV (Light Goods Vehicles), HGV (Heavy Goods Vehicles), OG1, OG2 and PSVs. As set out in the TII's Manual for Roads and Bridges (DMRB) all surveyed vehicles were converted to PCUs (passenger car units, or the equivalent flow in cars) data as follows:

Vehicle Type Survey	PCU Conversion Factor Applied
PCL (Pedal Cycles)	0.2
MCL (2 Wheeled Motorcycles)	0.4
Cars and LGV (Light Goods Vehicles)	1.0
OGV1 (Ordinary Goods Vehicles 1 - double rear wheel)	1.5
OGV2 (Ordinary Goods Vehicles 2 - >4 axles)	2.3
PSV (Passenger Service Vehicle)	2.0

Table 2-1 - PCU Conversion Factors Used

Only converted PCU values are discussed in the following sections of this report.

Please note: As the survey was completed outside of school term time, the baseline traffic figures surveyed will be increased by a standard 10% (based on guidance supplied in the TII Project Appraisal Guidelines Unit 16.2: Expansion Factors for Short Period Traffic Counts for Monthly Flow Indices).

The traffic surveys undertaken found that the mean morning and evening peak hour traffic flow at the existing junctions surrounding the development occurred at varying times, refer to Table 2-2 below for details.

Survey Location	AM Peak	PM Peak
Site 1 - R772 and Ashford Downs	10.30-11.30	16.00 - 17.00
Site 2 - Chestnut Glen and Ashford Downs	10.45 - 11.45	15.45 - 16.45
Site 3 - Ashford Downs and Ashleigh	10.45 - 11.45	16.00 - 17.00
Site 4 - Woodview and Unnamed Road	07.30 - 08.30	18.45 - 19.45

Table 2-2 - Traffic Survey AM/PM Peak times

3 Proposed Development

The Strategic Housing Development (SHD) will consist of 117 no. dwellings comprising 99 no. 2-4 bed houses (1- 2 storey) and a 3-storey block of 18 no., 2 & 3 bed duplex apartments. Provision of a creche, bin and bicycle storage, parking, open spaces, pump station and connection to the public road and footpath network via the adjoining Rossana Close / Woodview / Aishleigh estate road. All associated site development, landscaping, boundary treatments, and services connections."

The site is currently a green field site zoned for residential development under the Wicklow County Development Plan within the Ashford Town Plan 2016-2022, Section 1.9.

There is an existing site access which will be modified to account for the proposed development.

The site is bounded by other greenfield sites to the north and south which are also zoned for residential development. A future proposal incorporates a new vehicular access route constructed onto the R772 through the adjacent lands to the north which will serve the larger residential neighbourhood.

The proposed layout for the site development is detailed in the series of drawings by McCrossan O'Rourke Manning Architects accompanying this report and an extract is included in Figure 3-1.

Figure 3-1 - Proposed Site Layout

4 Person Trip Generation

4.1 Generated Vehicle Trips

Generated vehicle trips will access and egress the development using the existing junctions with the adjacent roads. To estimate the likely volumes of traffic that will be generated by the proposed development, trip rates recommended by TRICS (Trip Rate Computer Information System) for the proposed uses were extracted from the database and applied pro-rata to the relevant development uses. TRICS® (v7.6.1) enables its users to undertake calculations, using a number of calculation parameter options, to ascertain potential levels of trip generation for a user-defined development scenario.

4.2 Trics Estimate

The TRICS generated trip rates for the peak times are presented in Table 4-1 below and Appendix B for detailed data sheets of trip rates produced from TRICS.

	Calculation Factor	Trip rate				Number of Trips			
		AM Peak		PM Peak		AM Peak		PM Peak	
Land use	No of Dwellings	AM Arrivals	AM Departures	PM Arrivals	PM Departures	AM Arrivals	AM Departures	PM Arrivals	PM Departures
Dwelling	117	0.131	0.375	0.346	0.168	15	44	40	20

Table 4.1 - Estimated AM and PM peak hour traffic (vehicles) generated by proposed development using Trics trip rates

5 Traffic Forecasting

5.1 Future Baseline Traffic Growth

In the absence of any specific local traffic growth information it was assumed that baseline traffic will continue to grow at the levels recommended by the TII in the Project Appraisal Guidelines (PAG) - Unit 5.3 - Travel Demand Projections publication by the TII (May 2019). The Project Appraisal Guidelines describe three levels of transport model functionality. The static model, which reflects traffic volumes on the basis of link flows, is best suited to the proposed development. Such models do not attempt any route assignment, and hence are applicable for networks where no change in traffic flows will result from a proposed scheme. We have used figures from Table 6.1 'Link-Based Growth Rates' for the Wicklow County area.

The year of opening of the project is assumed to be 2023. A 15-year analysis period for the scheme would give a design year of 2038. The central growth factors for light vehicles from the Project Appraisal Guidelines - Unit 5.3 publication are detailed below:

TII County Area (Wicklow) Annual Traffic Growth Factor for 2006-2030 = 1.0157

TII County Area (Wicklow) Annual Traffic Growth Factor for 2030-2040 = 1.0051

The existing baseline traffic flows on the road network in the vicinity of the proposed development are predicted to increase at the above rates up to the design year.

6 Construction Stage Traffic

6.1 Construction Phase

The volumes of traffic that will be generated during the construction phase of the proposed development will be small in comparison to the existing traffic volumes.

The construction stage therefore does not require quantitative traffic analysis, however in order to minimise disruption due to construction, wheel washing facilities will be installed at the site access during the construction stage to reduce the amount of dirt and debris carried on to the public roadway during the excavation operations, etc.

6.2 Construction Traffic Management Plan

The successful contractor will be required to carry out a traffic management plan for the duration of the works. This will involve consultation with the local authority and/or the Gardaí, and once agreed will be adhered to for all aspects of construction that involves movement of vehicles in and out of the site.

7 Trip Assignment and Distribution

There will be an increase in traffic generated by the proposed development. All traffic entering and exiting the proposed development will be obliged to obey all road traffic regulatory requirements.

The proposed development traffic is expected to behave in a similar way to the existing traffic flows at each junction and will be apportioned during the analysis in accordance with the directional flow of the surveyed traffic.

8 Assessment and Road Impact

The proposed development size is below thresholds set by Transport Infrastructure Ireland (TII) for the requirements of a Traffic and Transport Assessment (TTA) as per Section 2 of the Traffic and Transport Assessment Guidelines May 2014. For completeness, an assessment of the impact of the traffic generated from the proposed development on the local external road network has been assessed.

This involved examining the projected traffic flows on the local road network both 'with' and 'without' the proposed development in place. The morning peak period and the evening peak period have been examined in order to assess the busiest case in terms of local traffic on the road network and traffic generated by the proposed development.

8.1 Junction Analysis

Capacity analysis was carried out for the junctions listed below:

Site 1 - R772 and Ashford Downs
Site 2 - Chestnut Glen and Ashford Downs
Site 3 - Ashford Downs and Ashleigh
Site 4 - Woodview and Unnamed Road

The following development scenarios were analysed with and without development for all junctions:

1. Survey year: 2020
2. Opening year: 2023
3. Design year: opening year + 5 years: 2028
4. Design year: opening year + 15 years: 2038

The traffic modelling assumed that the existing peak times coincided with the predicted development traffic peak times This is a worst-case situation prediction for the existing road network.

8.1.1 Site 1 - R772 and Ashford Downs

The Junctions 9 output is summarised below and the full detailed output is included in greater detail in Appendix C.

	Without Development			With Proposed Development		
Peak Hour Flow	Maximum RFC	Maximum Queue (Vehicles)	Maximum Delay (Seconds)	Maximum RFC	Maximum Queue (Vehicles)	Maximum Delay (Seconds)
AM 2020 Existing Survey	0.17	0.2	9.73	-	-	-
AM 2023 Opening Year	0.18	0.2	9.91	0.23	0.3	10.24
AM 2028 Design Year	0.19	0.2	10.21	0.24	0.3	10.51
AM 2038 Design Year	0.21	0.3	10.52	0.26	0.4	10.83
PM 2020 Existing Survey	0.17	0.2	9.94	-	-	-
PM 2023 Opening Year	0.18	0.2	10.13	0.21	0.3	10.60
PM 2028 Design Year	0.20	0.2	10.49	0.23	0.3	10.99
PM 2038 Design Year	0.21	0.3	10.82	0.24	0.3	11.35

Table 8-1 - Summary of Junctions 9 Analysis Results for Site 1 Junction

The above analysis shows that the existing junction has ample capacity to accept the full development traffic in operation during both the AM (Max RFC=26%) and PM (Max RFC=24%) peak hours.

8.1.2 Site 2 - Chestnut Glen and Ashford Downs

The Junctions 9 output is summarised below and the full detailed output is included in greater detail in Appendix C.

	Without Development			With Proposed Development		
Peak Hour Flow	Maximum RFC	Maximum Queue (Vehicles)	Maximum Delay (Seconds)	Maximum RFC	Maximum Queue (Vehicles)	Maximum Delay (Seconds)
AM 2020 Existing Survey	0.15	0.2	8.81	-	-	-
AM 2023 Opening Year	0.16	0.2	8.89	0.21	0.3	9.47
AM 2028 Design Year	0.17	0.2	9.09	0.22	0.3	9.70
AM 2038 Design Year	0.18	0.2	9.26	0.24	0.3	9.90
PM 2020 Existing Survey	0.11	0.1	8.21	-	-	-
PM 2023 Opening Year	0.11	0.1	8.28	0.12	0.1	8.46
PM 2028 Design Year	0.12	0.1	8.40	0.13	0.2	8.59
PM 2038 Design Year	0.13	0.1	8.57	0.14	0.2	8.77

Table 8-2 - Summary of Junctions 9 Analysis Results for Site 2 Junction

The above analysis shows that the existing junction has ample capacity to accept the full development traffic in operation during both the AM (Max RFC=24%) and PM (Max RFC=14%) peak hours.

8.1.3 Site 3 - Ashford Downs and Ashleigh

The Junctions 9 output is summarised below and the full detailed output is included in greater detail in Appendix C.

	Without Development			With Proposed Development		
Peak Hour Flow	Maximum RFC	Maximum Queue (Vehicles)	Maximum Delay (Seconds)	Maximum RFC	Maximum Queue (Vehicles)	Maximum Delay (Seconds)
AM 2020 Existing Survey	0.12	0.1	7.73	-	-	-
AM 2023 Opening Year	0.12	0.1	7.83	0.21	0.3	8.76
AM 2028 Design Year	0.13	0.2	7.93	0.22	0.3	8.90
AM 2038 Design Year	0.14	0.2	8.05	0.23	0.3	9.04
PM 2020 Existing Survey	0.12	0.1	8.19	-	-	-
PM 2023 Opening Year	0.12	0.1	8.24	0.16	0.2	8.81
PM 2028 Design Year	0.13	0.1	8.40	0.17	0.2	8.98
PM 2038 Design Year	0.14	0.2	8.55	0.19	0.2	9.17

Table 8-3 - Summary of Junctions 9 Analysis Results for Site 3 Junction

The above analysis shows that the existing junction has ample capacity to accept the full development traffic in operation during both the AM (Max RFC=23%) and PM (Max RFC=19%) peak hours.

8.1.4 Site 4 - Woodview and Unnamed Road

The Junctions 9 output is summarised below and the full detailed output is included in greater detail in Appendix C.

	Without Development			With Proposed Development		
Peak Hour Flow	Maximum RFC	Maximum Queue (Vehicles)	Maximum Delay (Seconds)	Maximum RFC	Maximum Queue (Vehicles)	Maximum Delay (Seconds)
AM 2020 Existing Survey	0.03	0	7.82	-	-	-
AM 2023 Opening Year	0.03	0	7.84	0.13	0.1	8.75
AM 2028 Design Year	0.03	0	7.87	0.13	0.1	8.78
AM 2038 Design Year	0.03	0	7.89	0.13	0.2	8.82
PM 2020 Existing Survey	0.02	0	7.67	-	-	-
PM 2023 Opening Year	0.02	0	7.71	0.07	0.1	8.30
PM 2028 Design Year	0.02	0	7.77	0.07	0.1	8.36
PM 2038 Design Year	0.02	0	7.79	0.07	0.1	8.37

Table 8-4 - Summary of Junctions 9 Analysis Results for Site 4 Junction

The above analysis shows that the existing junction has ample capacity to accept the full development traffic in operation during both the AM (Max RFC=13%) and PM (Max RFC=7%) peak hours.

8.1.5 Analysis Summary

Junction	2038 Without Development RFC	2038 With Development RFC
Site 1 - R772 and Ashford Downs	21%	26%
Site 2 - Chestnut Glen and Ashford Downs	18%	24%
Site 3 - Ashford Downs and Ashleigh	14%	23%
Site 4 - Woodview and Unnamed Road	3%	13%

Table 8-5 Summary Results all Surrounding Junctions

From the above modelling results we conclude that the surrounding road network and adjacent existing junctions will have sufficient operational capacity to accept the development traffic given that the design threshold for priority junctions is 85% RFC.

9 Internal layout

The site includes the proposed development buildings and parking facilities. The proposed development has been assessed for compliance with "Design Manual for Urban Roads and Streets" (DMURS) published by the Department of Transport, Tourism and Sport & the Department of Environment, Community and Local Government. A DMURS Compliance Statement was prepared by PUNCH and is included in the planning documentation accompanying this application.

10 Quality/Road Safety Audit

A Stage 1 Quality Audit of the existing surrounding road network has been completed by an independent assessor, Road Safety Matters. The recommendations of the Audit have been issued to Wicklow County Council for their consideration.

A Stage 1 Road Safety Audit of the proposed site design has been completed by an independent assessor, Road Safety Matters. The document is included in the planning documentation accompanying this application. The recommendations of the Audit have been incorporated into the current site layout plans.

11 Summary and Conclusion

i. The Strategic Housing Development (SHD) will consist of 117 no. dwellings comprising 99 no. 2-4 bed houses (1- 2 storey) and a 3-storey block of 18 no., 2 & 3 bed duplex apartments. Provision of a creche, bin and bicycle storage, parking, open spaces, pump station and connection to the public road and footpath network via the adjoining Rossana Close / Woodview / Aishleigh estate road. All associated site development, landscaping, boundary treatments, and services connections.

ii. It is proposed to access the proposed development via the existing residential development Roassana Close.

iii. For the purposes of our assessment, the TRICS database was consulted to provide an equivalent trip rate for the proposed type of development.

iv. The proposed development traffic flows generated are below the threshold set by TII for the preparation of a TTA. However, capacity analysis was carried out on 4 existing junctions surrounding the proposed development. The analysis shows that the surrounding road network and adjacent existing junctions will have sufficient operational capacity to accept the development traffic up to the Design Year 2038 and beyond.

v. The existing road system is expected to experience negligible impact from the proposed development.

Appendix A Traffic Survey Data

IDASO
Innovative Data Solutions

Idaso Ltd
National Science Park
Dublin Road, Mullingar,
Co Westmeath, Ireland

Office
Ph: +353 (0) 4493 18019
Email: info@idaso.ie

www.idaso.ie

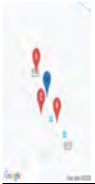
Data Analysis Services
Traffic-Transportation- Commercial-Innovation

087 20172 Ashford

with compliments

IDASO

Survey Name: 087 20172 Ashford
Date: Tue 30 Jun 2020



IDASO

Survey Name: 087 20172 Ashford

Site: Site 1

Location: R772 / Ashford Downs

Date: Tue 30-Jun-2020

A => A

TIME	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU
06:00	0	0	0	0	0	0	0	0	0	0
06:15	0	0	0	0	0	0	0	0	0	0
06:30	0	0	0	0	0	0	0	0	0	0
06:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
07:00	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
19:00	0	0	0	0	0	0	0	0	0	0
19:15	0	0	0	0	0	0	0	0	0	0
19:30	0	0	0	0	0	0	0	0	0	0
19:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
20:00	0	0	0	0	0	0	0	0	0	0

A => B

TIME	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU
06:00	0	0	2	0	0	0	1	0	3	4.3
06:15	0	0	1	0	0	0	0	0	1	1
06:30	0	0	6	0	2	0	0	0	8	8
06:45	0	0	5	0	3	0	0	0	8	8
H/TOT	0	0	14	0	5	0	1	0	20	21.3
07:00	0	0	9	0	2	0	0	1	12	13
07:15	0	0	4	0	6	2	0	0	12	13
07:30	0	0	13	0	10	1	0	0	24	24.5
07:45	0	0	19	0	6	4	1	0	30	33.3
H/TOT	0	0	45	0	24	7	1	1	78	83.8
08:00	1	0	6	0	3	1	0	1	12	12.7
08:15	0	0	16	0	3	1	0	0	20	20.5
08:30	0	0	23	0	5	0	0	0	28	28
08:45	0	0	31	0	7	1	1	1	41	43.8
H/TOT	1	0	76	0	18	3	1	2	101	105
09:00	0	0	19	0	5	3	0	1	28	30.5
09:15	0	0	17	0	3	0	0	0	20	20
09:30	0	0	32	1	5	4	0	0	42	44
09:45	1	0	30	0	3	3	0	0	37	37.7
H/TOT	1	0	98	1	16	10	0	1	127	132
10:00	0	0	37	0	4	1	1	1	44	46.8
10:15	0	0	25	0	3	1	1	0	30	31.8
10:30	1	0	38	0	4	0	0	0	43	42.2
10:45	0	0	20	0	3	0	0	0	23	23
H/TOT	1	0	120	0	14	2	2	1	140	144
11:00	1	0	37	0	2	0	1	0	41	41.5
11:15	3	0	39	0	5	3	0	2	52	53.1
11:30	1	0	49	0	5	0	0	0	55	54.2
11:45	2	0	35	1	5	4	0	0	47	47.4
H/TOT	7	0	160	1	17	7	1	2	195	196
12:00	0	0	58	0	6	3	1	1	69	72.8
12:15	0	0	38	0	10	0	0	0	48	48
12:30	1	4	42	0	4	3	0	0	54	52.3
12:45	0	0	39	0	0	1	1	0	41	42.8
H/TOT	1	4	177	0	20	7	2	1	212	216
13:00	0	0	48	0	2	1	1	0	52	53.8
13:15	1	0	54	0	8	1	1	1	66	68
13:30	1	0	40	0	0	2	0	0	43	43.2
13:45	0	0	50	1	1	3	0	0	55	56.5
H/TOT	2	0	192	1	11	7	2	1	216	222
14:00	1	0	38	0	2	0	0	0	41	40.2
14:15	0	0	41	0	4	1	3	1	50	55.4
14:30	0	0	36	0	5	1	0	0	42	42.5
14:45	1	0	50	0	6	1	0	0	58	57.7
H/TOT	2	0	165	0	17	3	3	1	191	196
15:00	4	0	53	0	5	1	0	0	63	60.3
15:15	0	1	55	0	5	2	0	1	64	65.4
15:30	0	0	57	0	3	4	2	0	66	70.6
15:45	0	0	49	0	9	4	0	0	62	64
H/TOT	4	1	214	0	22	11	2	1	255	260
16:00	2	0	58	0	7	0	0	1	68	67.4
16:15	0	0	49	0	6	2	0	1	58	60
16:30	0	0	52	0	10	1	1	0	64	65.8
16:45	2	1	44	0	9	0	0	0	56	53.8
H/TOT	4	1	203	0	32	3	1	2	246	247
17:00	0	0	44	0	7	0	0	0	51	51
17:15	0	0	41	0	6	1	0	1	49	50.5
17:30	1	0	48	0	3	2	2	3	59	64.8
17:45	1	0	42	0	7	1	1	0	52	53
H/TOT	2	0	175	0	23	4	3	4	211	219
18:00	0	1	36	0	6	0	0	0	43	42.4
18:15	0	1	33	0	3	1	1	2	41	44.2
18:30	3	0	28	0	5	1	0	2	39	39.1
18:45	1	0	32	0	5	1	0	0	39	38.7
H/TOT	4	2	129	0	19	3	1	4	162	164
19:00	1	1	28	0	1	0	0	1	32	31.6
19:15	0	0	24	1	1	0	0	1	27	28
19:30	0	0	22	0	2	0	0	0	24	24
19:45	1	0	25	0	3	1	0	0	30	29.7
H/TOT	2	1	99	1	7	1	0	2	113	113
20:00	0	0	20	0	2	1	0	0	23	23.5

A => C

TIME	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU
06:00	0	0	0	0	0	0	0	0	0	0
06:15	0	0	0	0	0	0	0	0	0	0
06:30	0	0	0	0	0	0	0	0	0	0
06:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
07:00	0	0	0	0	0	0	0	0	0	0
07:15	0	0	1	0	0	0	0	0	1	1
07:30	0	0	1	0	0	0	0	0	1	1
07:45	0	0	0	0	2	0	0	0	2	2
H/TOT	0	0	2	0	2	0	0	0	4	4
08:00	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	1	0	0	0	1	1
08:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	1	0	0	0	1	1
09:00	0	0	1	0	0	0	0	0	1	1
09:15	0	0	1	0	0	0	0	0	1	1
09:30	0	0	1	0	0	0	0	0	1	1
09:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	3	0	0	0	0	0	3	3
10:00	0	0	2	0	0	0	0	0	2	2
10:15	0	0	2	0	0	1	0	0	3	3.5
10:30	0	0	1	0	0	0	0	0	1	1
10:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	6	0	0	1	0	0	7	7.5
11:00	0	0	2	0	0	0	0	0	2	2
11:15	0	0	1	0	0	0	0	0	1	1
11:30	0	0	2	0	2	1	0	0	5	5.5
11:45	0	0	2	0	0	0	0	0	2	2
H/TOT	0	0	7	0	2	1	0	0	10	10.5
12:00	1	0	3	0	0	0	0	0	4	3.2
12:15	0	0	4	0	0	0	0	0	4	4
12:30	0	0	0	0	0	0	0	0	0	0
12:45	0	0	1	0	0	1	0	0	2	2.5
H/TOT	1	0	8	0	0	1	0	0	10	9.7
13:00	0	0	5	0	0	0	0	0	5	5
13:15	0	0	4	0	0	0	0	0	4	4
13:30	0	0	2	0	0	0	0	0	2	2
13:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	12	0	0	0	0	0	12	12
14:00	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0
14:30	0	0	2	0	0	0	0	0	2	2
14:45	0	0	3	0	0	0	0	0	3	3
H/TOT	0	0	5	0	0	0	0	0	5	5
15:00	0	0	2	0	0	0	0	0	2	2
15:15	0	0	5	0	0	0	0	0	5	5
15:30	0	0	2	0	0	0	0	0	2	2
15:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	10	0	0	0	0	0	10	10
16:00	0	0	2	0	0	0	0	0	2	2
16:15	0	0	1	0	0	0	0	0	1	1
16:30	0	0	3	0	0	0	0	0	3	3
16:45	0	0	1	0	0	1	0	0	2	2.5
H/TOT	0	0	7	0	0	1	0	0	8	8.5
17:00	0	0	3	0	0	0	0	0	3	3
17:15	0	0	0	0	0	0	0	0	0	0
17:30	0	0	8	0	0	0	0	0	8	8
17:45	1	0	1	0	0	0	0	0	2	1.2
H/TOT	1	0	12	0	0	0	0	0	13	12.2
18:00	0	0	1	0	0	0	0	0	1	1
18:15	0	0	0	0	0	0	0	0	0	0
18:30	0	0	1	0	0	0	0	0	1	1
18:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	3	0	0	0	0	0	3	3
19:00	0	0	0	0	0	0	0	0	0	0
19:15	2	0	1	0	1	0	0	0	4	2.4
19:30	0	0	1	0	0	0	0	0	1	1
19:45	0	0	1	0	0	0	0	0	1	1
H/TOT	2	0	3	0	1	0	0	0	6	4.4
20:00	0	0	1	0	0	0	0	0	1	1

B => A

TIME	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU
06:00	0	0	0	0	0	0	0	0	0	0
06:15	0	0	2	0	0	1	0	1	4	5.5
06:30	0	0	9	0	1	0	0	1	11	12
06:45	0	0	9	0	2	0	1	1	13	15.3
H/TOT	0	0	20	0	3	1	1	3	28	32.8
07:00	0	0	8	0	5	0	0	0	13	13
07:15	0	0	8	0	9	0	0	1	18	19
07:30	0	0	9	0	9	1	0	0	19	19.5
07:45	2	0	15	0	6	2	0	2	27	28.4
H/TOT	2	0	40	0	29	3	0	3	77	79.9
08:00	0	0	7	0	5	1	0	0	13	13.5
08:15	0	1	20	0	2	1	0	0	24	23.9
08:30	0	0	31	1	6	2	1	0	41	43.3
08:45	0	0	28	0	6	1	0	1	36	37.5
H/TOT	0	1	86	1	19	5	1	1	114	118
09:00	0	1	23	0	2	6	0	0	32	34.4
09:15	1	0	21	0	3	2	1	0	28	29.5
09:30	0	0	19	0	4	1	1	1	26	28.8
09:45	2	0	26	0	1	1	0	0	30	28.9
H/TOT	3	1	89	0	10	10	2	1	116	122
10:00	1	0	29	1	8	2	0	0	41	41.2
10:15	1	0	29	0	4	0	0	1	35	35.2
10:30	0	0	24	0	7	2	2	0	35	38.6
10:45	0	0	37	0	6	0	0	1	44	45
H/TOT	2	0	119	1	25	4	2	2	155	160
11:00	1	0	48	0	3	2	0	0	54	54.2
11:15	3	0	39	0	7	2	1	1	53	53.9
11:30	4	0	49	0	6	1	1	0	61	59.6
11:45	0	0	41	0	3	0	0	0	44	44
H/TOT	8	0	177	0	19	5	2	1	212	212
12:00	0	0	51	0	5	0	0	0	56	56
12:15	0	0	32	0	1	3	0	1	37	39.5
12:30	2	1	48	0	4	3	1	0	59	59.6
12:45	0	0	47	0	4	2	2	0	55	58.6
H/TOT	2	1	178	0	14	8	3	1	207	214
13:00	0	1	48	0	6	2	0	0	57	57.4
13:15	4	0	39	0	8	0	0	1	52	49.8
13:30	0	0	38	0	3	0	0	0	41	41
13:45	1	0	33	1	9	2	2	0	48	50.8
H/TOT	5	1	158	1	26	4	2	1	198	199
14:00	0	0	52	0	4	1	0	0	57	57.5
14:15	1	0	33	0	2	0	1	1	38	39.5
14:30	0	0	52	0	9	2	0	0	63	64
14:45	0	0	55	0	3	2	0	1	61	63
H/TOT	1	0	192	0	18	5	1	2	219	224
15:00	1	0	46	0	5	2	1	0	55	56.5
15:15	0	0	60	0	6	0	1	1	68	70.3
15:30	0	0	45	0	5	0	1	0	51	52.3
15:45	2	1	66	0	1	3	1	0	74	74.6
H/TOT	3	1	217	0	17	5	4	1	248	254
16:00	1	0	43	0	5	1	0	0	50	49.7
16:15	2	0	32	1	4	1	1	2	43	45.2
16:30	0	0	39	0	7	1	1	0	48	49.8
16:45	0	0	46	0	6	0	1	0	53	54.3
H/TOT	3	0	160	1	22	3	3	2	194	199
17:00	2	0	45	0	7	0	0	0	54	52.4
17:15	2	0	56	0	5	0	0	1	64	63.4
17:30	0	0	46	0	7	1	0	0	54	54.5
17:45	3	0	36	0	6	0	0	1	46	44.6
H/TOT	7	0	183	0	25	1	0	2	218	215
18:00	1	0	31	0	4	1	0	0	37	36.7
18:15	2	0	28	0	3	1	0	1	35	34.9
18:30	3	0	28	0	2	3	0	0	36	35.1
18:45	0	1	32	0	3	0	0	0	36	35.4
H/TOT	6	1	119	0	12	5	0	1	144	142
19:00	3	0	34	1	2	0	0	0	40	37.6
19:15	2	0	27	0	2	2	0	2	35	36.4
19:30	1	0	25	1	2	1	0	0	30	29.7
19:45	1	0	19	0	0	0	0	0	20	19.2
H/TOT	7	0	105	2	6	3	0	2	125	123
20:00	0	0	23	0	1	0	0	0	24	24

B => B

TIME	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU
06:00	0	0	0	0	0	0	0	0	0	0
06:15	0	0	0	0	0	0	0	0	0	0
06:30	0	0	0	0	0	0	0	0	0	0
06:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
07:00	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
19:00	0	0	0	0	0	0	0	0	0	0
19:15	0	0	0	0	0	0	0	0	0	0
19:30	0	0	0	0	0	0	0	0	0	0
19:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
20:00	0	0	0	0	0	0	0	0	0	0

B => C

TIME	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU
06:00	0	0	1	0	1	0	0	0	2	2
06:15	0	0	1	0	0	0	0	0	1	1
06:30	0	0	1	0	0	0	0	0	1	1
06:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	3	0	1	0	0	0	4	4
07:00	0	0	1	0	0	0	0	0	1	1
07:15	0	0	2	0	1	0	0	0	3	3
07:30	0	0	2	0	2	0	0	0	4	4
07:45	0	0	5	0	5	0	1	0	11	12.3
H/TOT	0	0	10	0	8	0	1	0	19	20.3
08:00	0	0	2	0	4	1	0	0	7	7.5
08:15	0	0	5	0	2	1	0	0	8	8.5
08:30	0	0	7	0	3	0	0	0	10	10
08:45	0	0	5	0	1	0	0	0	6	6
H/TOT	0	0	19	0	10	2	0	0	31	32
09:00	0	0	6	0	1	0	0	0	7	7
09:15	0	0	6	0	1	0	1	0	8	9.3
09:30	1	0	3	0	1	1	0	0	6	5.7
09:45	0	0	8	0	0	0	0	0	8	8
H/TOT	1	0	23	0	3	1	1	0	29	30
10:00	0	0	11	0	0	0	1	0	12	13.3
10:15	0	0	11	0	0	0	0	0	11	11
10:30	0	0	10	0	2	0	0	0	12	12
10:45	1	0	7	0	0	0	0	0	8	7.2
H/TOT	1	0	39	0	2	0	1	0	43	43.5
11:00	0	0	8	0	1	0	0	1	10	11
11:15	0	0	5	0	2	0	1	0	8	9.3
11:30	0	0	5	0	2	0	0	0	7	7
11:45	0	0	14	1	0	1	2	0	18	21.1
H/TOT	0	0	32	1	5	1	3	1	43	48.4
12:00	1	0	5	0	3	0	0	0	9	8.2
12:15	0	0	7	0	2	0	0	1	10	11
12:30	0	0	5	0	1	0	0	0	6	6
12:45	0	0	10	0	3	0	0	0	13	13
H/TOT	1	0	27	0	9	0	0	1	38	38.2
13:00	0	0	14	0	1	0	0	0	15	15
13:15	0	0	9	1	0	0	0	0	10	10
13:30	1	0	8	0	0	0	0	0	9	8.2
13:45	0	0	13	0	1	0	0	0	14	14
H/TOT	1	0	44	1	2	0	0	0	48	47.2
14:00	0	0	12	0	1	0	0	0	13	13
14:15	1	0	21	0	0	0	0	0	22	21.2
14:30	0	0	13	0	1	1	1	0	16	17.8
14:45	1	0	5	0	0	1	0	0	7	6.7
H/TOT	2	0	51	0	2	2	1	0	58	58.7
15:00	0	0	9	0	0	1	0	0	10	10.5
15:15	0	0	7	0	1	0	0	0	8	8
15:30	0	0	15	0	0	1	0	0	16	16.5
15:45	0	0	5	0	1	0	0	0	6	6
H/TOT	0	0	36	0	2	2	0	0	40	41
16:00	0	0	5	0	1	1	0	0	7	7.5
16:15	0	0	8	0	1	0	0	0	9	9
16:30	0	1	13	0	3	0	0	0	17	16.4
16:45	0	0	12	0	6	1	0	0	19	19.5
H/TOT	0	1	38	0	11	2	0	0	52	52.4
17:00	0	0	23	0	5	1	0	0	29	29.5
17:15	1	0	18	0	0	0	1	0	20	20.5
17:30	0	0	13	0	0	0	0	0	13	13
17:45	0	0	8	0	1	0	0	0	9	9
H/TOT	1	0	62	0	6	1	1	0	71	72
18:00	1	0	10	0	1	0	0	0	12	11.2
18:15	0	0	15	0	4	0	0	0	19	19
18:30	0	0	10	0	2	1	0	0	13	13.5
18:45	0	0	7	0	2	0	0	0	9	9
H/TOT	1	0	42	0	9	1	0	0	53	52.7
19:00	0	0	10	0	2	0	0	0	12	12
19:15	0	0	7	0	0	0	0	0	7	7
19:30	0	0	10	0	0	0	0	0	10	10
19:45	1	0	6	0	1	0	0	0	8	7.2
H/TOT	1	0	33	0	3	0	0	0	37	36.2
20:00	0	0	7	0	0	0	0	0	7	7

C => A

TIME	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU
06:00	0	0	0	0	0	0	0	0	0	0
06:15	0	0	0	0	0	0	0	0	0	0
06:30	0	0	1	0	0	0	0	0	1	1
06:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	0	1	1
07:00	0	0	0	0	1	0	0	0	1	1
07:15	0	0	1	0	0	0	0	0	1	1
07:30	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	1	0	0	0	1	1
H/TOT	0	0	1	0	2	0	0	0	3	3
08:00	0	0	1	0	0	0	0	0	1	1
08:15	0	0	2	0	0	0	0	0	2	2
08:30	0	0	1	0	0	0	0	0	1	1
08:45	0	0	3	0	0	0	0	0	3	3
H/TOT	0	0	7	0	0	0	0	0	7	7
09:00	0	0	1	0	0	0	0	0	1	1
09:15	1	0	0	0	1	0	0	0	2	1.2
09:30	0	0	0	0	0	0	0	0	0	0
09:45	0	0	4	0	0	1	0	0	5	5.5
H/TOT	1	0	5	0	1	1	0	0	8	7.7
10:00	0	0	2	0	0	0	0	0	2	2
10:15	0	0	5	0	0	0	0	0	5	5
10:30	0	0	2	0	0	0	0	0	2	2
10:45	0	0	1	0	1	0	0	0	2	2
H/TOT	0	0	10	0	1	0	0	0	11	11
11:00	0	0	2	0	0	0	0	0	2	2
11:15	0	0	1	0	1	0	0	0	2	2
11:30	0	0	2	0	1	0	0	0	3	3
11:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	5	0	2	0	0	0	7	7
12:00	0	0	6	0	0	0	0	0	6	6
12:15	0	0	1	0	0	0	0	0	1	1
12:30	0	0	0	0	0	0	0	0	0	0
12:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	8	0	0	0	0	0	8	8
13:00	0	0	6	0	0	0	0	0	6	6
13:15	0	0	1	0	0	0	0	0	1	1
13:30	0	0	1	0	0	0	0	0	1	1
13:45	0	0	1	0	0	1	0	0	2	2.5
H/TOT	0	0	9	0	0	1	0	0	10	10.5
14:00	0	0	3	0	0	0	0	0	3	3
14:15	0	0	2	0	0	0	0	0	2	2
14:30	0	0	0	0	0	0	0	0	0	0
14:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	6	0	0	0	0	0	6	6
15:00	0	0	3	0	0	1	0	0	4	4.5
15:15	0	0	4	0	1	0	0	0	5	5
15:30	0	0	2	0	0	0	0	0	2	2
15:45	0	0	3	0	0	0	0	0	3	3
H/TOT	0	0	12	0	1	1	0	0	14	14.5
16:00	0	0	1	0	0	0	0	0	1	1
16:15	0	0	3	0	0	0	0	0	3	3
16:30	0	0	1	0	0	0	0	0	1	1
16:45	0	0	5	0	0	0	0	0	5	5
H/TOT	0	0	10	0	0	0	0	0	10	10
17:00	0	0	1	0	0	0	0	0	1	1
17:15	0	0	0	0	0	0	0	0	0	0
17:30	0	0	2	0	0	0	0	0	2	2
17:45	4	0	2	0	1	0	0	0	7	3.8
H/TOT	4	0	5	0	1	0	0	0	10	6.8
18:00	0	0	0	0	0	0	0	0	0	0
18:15	0	0	1	0	0	0	0	0	1	1
18:30	0	0	3	0	0	0	0	0	3	3
18:45	0	0	1	0	1	0	0	0	2	2
H/TOT	0	0	5	0	1	0	0	0	6	6
19:00	0	0	2	0	0	0	0	0	2	2
19:15	0	0	0	0	0	0	0	0	0	0
19:30	0	0	1	0	0	0	0	0	1	1
19:45	0	0	3	0	0	0	0	0	3	3
H/TOT	0	0	6	0	0	0	0	0	6	6
20:00	0	0	0	0	0	0	0	0	0	0

C => B

TIME	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU
06:00	0	0	4	0	0	0	0	0	4	4
06:15	0	0	1	0	3	0	0	0	4	4
06:30	0	0	2	0	1	1	0	0	4	4.5
06:45	0	0	6	0	2	1	0	0	9	9.5
H/TOT	0	0	13	0	6	2	0	0	21	22
07:00	0	0	1	1	1	0	0	0	3	3
07:15	0	0	1	0	2	0	0	0	3	3
07:30	1	0	7	0	3	0	0	0	11	10.2
07:45	0	0	6	0	3	0	0	0	9	9
H/TOT	1	0	15	1	9	0	0	0	26	25.2
08:00	1	0	12	0	1	1	0	0	15	14.7
08:15	0	0	12	0	3	1	0	0	16	16.5
08:30	0	1	9	0	2	1	1	0	14	15.2
08:45	0	0	15	0	3	0	0	0	18	18
H/TOT	1	1	48	0	9	3	1	0	63	64.4
09:00	1	0	3	0	1	0	0	0	5	4.2
09:15	0	0	10	0	2	0	0	0	12	12
09:30	1	0	7	0	1	1	0	0	10	9.7
09:45	0	0	11	0	2	1	0	0	14	14.5
H/TOT	2	0	31	0	6	2	0	0	41	40.4
10:00	1	0	6	0	1	0	0	0	8	7.2
10:15	0	0	3	0	1	0	0	0	4	4
10:30	0	0	12	0	0	0	0	0	12	12
10:45	0	0	10	0	0	0	1	0	11	12.3
H/TOT	1	0	31	0	2	0	1	0	35	35.5
11:00	0	0	14	0	1	0	0	0	15	15
11:15	0	0	13	0	0	0	0	0	13	13
11:30	0	0	13	0	0	0	0	0	13	13
11:45	0	0	11	1	1	0	1	0	14	15.3
H/TOT	0	0	51	1	2	0	1	0	55	56.3
12:00	0	0	8	0	2	0	0	0	10	10
12:15	0	0	15	0	2	0	0	0	17	17
12:30	0	0	10	0	1	0	0	1	12	13
12:45	0	0	16	0	1	1	0	0	18	18.5
H/TOT	0	0	49	0	6	1	0	1	57	58.5
13:00	0	0	17	0	2	0	0	0	19	19
13:15	0	0	14	0	0	0	0	0	14	14
13:30	0	0	6	0	0	0	0	0	6	6
13:45	0	0	8	0	0	0	0	0	8	8
H/TOT	0	0	45	0	2	0	0	0	47	47
14:00	1	0	11	0	0	1	0	0	13	12.7
14:15	0	0	13	0	1	0	0	0	14	14
14:30	0	0	11	0	1	0	0	0	12	12
14:45	0	0	10	0	5	0	0	0	15	15
H/TOT	1	0	45	0	7	1	0	0	54	53.7
15:00	0	0	8	0	1	0	1	0	10	11.3
15:15	0	0	11	0	0	0	0	0	11	11
15:30	0	0	4	0	0	0	0	0	4	4
15:45	0	0	6	0	1	0	0	0	7	7
H/TOT	0	0	29	0	2	0	1	0	32	33.3
16:00	0	0	8	0	0	0	0	0	8	8
16:15	0	0	7	0	1	0	0	0	8	8
16:30	0	0	9	0	0	0	0	0	9	9
16:45	0	0	11	0	2	0	0	0	13	13
H/TOT	0	0	35	0	3	0	0	0	38	38
17:00	0	0	17	0	4	0	0	0	21	21
17:15	0	0	12	0	0	0	0	0	12	12
17:30	0	0	11	0	3	0	0	0	14	14
17:45	0	0	11	0	2	0	1	0	14	15.3
H/TOT	0	0	51	0	9	0	1	0	61	62.3
18:00	0	0	10	0	5	0	0	0	15	15
18:15	1	0	4	0	2	0	0	0	7	6.2
18:30	0	0	11	0	2	0	0	0	13	13
18:45	0	0	16	0	0	0	0	0	16	16
H/TOT	1	0	41	0	9	0	0	0	51	50.2
19:00	0	0	5	0	0	0	0	0	5	5
19:15	0	0	8	0	0	0	0	0	8	8
19:30	1	0	6	0	0	0	0	0	7	6.2
19:45	0	0	10	0	1	0	0	0	11	11
H/TOT	1	0	29	0	1	0	0	0	31	30.2
20:00	0	0	4	0	0	1	0	0	5	5.5

C => C

TIME	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU
06:00	0	0	0	0	0	0	0	0	0	0
06:15	0	0	0	0	0	0	0	0	0	0
06:30	0	0	0	0	0	0	0	0	0	0
06:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
07:00	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
19:00	0	0	0	0	0	0	0	0	0	0
19:15	0	0	0	0	0	0	0	0	0	0
19:30	0	0	0	0	0	0	0	0	0	0
19:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
20:00	0	0	0	0	0	0	0	0	0	0

20:15	0	0	1	0	0	0	0	0	1	1	1	1	22	0	1	0	0	1	26	25.6	1	0	0	0	0	0	0	0	1	0.2
20:30	0	0	0	0	0	0	0	0	0	0	0	0	25	0	2	1	0	0	28	28.5	0	0	0	0	0	0	0	0	0	0
20:45	0	0	0	0	0	0	0	0	0	0	0	0	15	0	0	1	0	0	16	16.5	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	0	1	1	1	1	82	0	5	3	0	1	93	94.1	1	0	1	0	0	0	0	0	2	1.2
21:00	0	0	0	0	0	0	0	0	0	0	2	0	12	0	3	0	1	0	18	17.7	0	0	0	0	0	0	0	0	0	0
21:15	0	0	0	0	0	0	0	0	0	0	0	0	21	0	1	0	0	1	23	24	0	0	1	0	0	0	0	0	1	1
21:30	0	0	0	0	0	0	0	0	0	0	1	0	21	0	1	0	0	0	23	22.2	0	0	0	0	0	1	0	0	1	1.5
21:45	0	0	0	0	0	0	0	0	0	0	0	0	8	0	1	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	3	0	62	0	6	0	1	1	73	72.9	0	0	1	0	0	1	0	0	2	2.5
16 TOT	0	0	1	0	0	0	0	0	1	1	35	10	2011	4	256	71	21	25	243	248	5	0	80	0	6	5	0	0	96	94.5

20:15	5	0	17	1	3	1	0	1	28	25.5	0	0	0	0	0	0	0	0	0	0	3	0	6	0	0	0	0	0	9	6.6
20:30	0	1	11	1	1	0	0	0	14	13.4	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	10	10
20:45	0	0	12	0	1	0	0	0	13	13	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	1	0	0	5	5.5
H/TOT	5	1	63	2	6	1	0	1	79	75.9	0	0	0	0	0	0	0	0	0	0	3	0	26	0	1	1	0	0	31	29.1
21:00	0	0	13	0	0	0	0	0	13	13	0	0	0	0	0	0	0	0	0	0	0	0	9	0	2	0	0	0	11	11
21:15	1	0	14	1	1	0	0	1	18	18.2	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	9	9
21:30	0	0	16	0	1	0	0	0	17	17	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	5	5
21:45	1	0	14	0	0	0	0	0	15	14.2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	3	3
H/TOT	2	0	57	1	2	0	0	1	63	62.4	0	0	0	0	0	0	0	0	0	0	0	0	25	0	3	0	0	0	28	28
16 TOT	56	7	1963	9	253	63	21	25	239	243	0	0	0	0	0	0	0	0	0	0	12	1	510	2	77	13	8	2	625	634

20:15	0	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0
20:30	0	0	0	0	0	0	0	0	0	0	2	1	1	0	0	0	0	0	4	1.8	0	0	0	0	0	0	0	0	0	0
20:45	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	2	1	11	0	1	1	0	0	16	14.3	0	0	0	0	0	0	0	0	0	0
21:00	0	0	1	0	0	0	0	0	1	1	0	0	6	0	1	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0
21:15	0	0	1	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
21:30	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0
21:45	0	0	1	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	3	0	0	0	0	0	3	3	0	0	12	0	1	0	0	0	13	13	0	0	0	0	0	0	0	0	0	0
16 TOT	5	0	93	0	9	3	0	0	110	108	10	2	536	2	75	10	5	1	641	644	0	0	0	0	0	0	0	0	0	0

IDASO

Survey Name: 087 20172 Ashford
Site: Site 2
Location: Chestnut Glen / Ashford Downs
Date: Tue 30-Jun-2020

A => A

TIME	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU
06:00	0	0	0	0	0	0	0	0	0	0
06:15	0	0	0	0	0	0	0	0	0	0
06:30	0	0	0	0	0	0	0	0	0	0
06:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
07:00	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0
11:15	0	1	0	0	0	0	0	0	1	1
11:30	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	1	0	0	0	0	0	0	1	1
12:00	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0
14:30	0	1	0	0	0	0	0	0	1	1
14:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	1	0	0	0	0	0	0	1	1
15:00	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
19:00	0	0	0	0	0	0	0	0	0	0
19:15	0	0	0	0	0	0	0	0	0	0
19:30	0	0	0	0	0	0	0	0	0	0
19:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
20:00	0	0	0	0	0	0	0	0	0	0

A => B

TIME	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU
06:00	0	0	1	0	0	0	0	0	1	1
06:15	0	0	0	0	0	0	0	0	0	0
06:30	0	0	0	0	1	0	0	0	1	1
06:45	0	0	2	0	1	0	0	0	3	3
H/TOT	0	0	3	0	2	0	0	0	5	5
07:00	0	0	1	0	1	0	0	0	2	2
07:15	0	0	2	0	1	0	0	0	3	3
07:30	0	0	1	0	0	0	0	0	1	1
07:45	0	0	2	0	0	0	0	0	2	2
H/TOT	0	0	6	0	2	0	0	0	8	8
08:00	0	0	5	0	1	0	0	0	6	6
08:15	0	0	2	0	0	0	0	0	2	2
08:30	0	0	3	0	1	0	0	0	4	4
08:45	0	0	8	0	0	0	0	0	8	8
H/TOT	0	0	18	0	2	0	0	0	20	20
09:00	0	0	0	0	0	1	0	0	1	1.5
09:15	0	0	2	0	0	0	0	0	2	2
09:30	0	0	7	0	0	1	0	0	8	8.5
09:45	0	0	5	0	1	0	0	0	6	6
H/TOT	0	0	14	0	1	2	0	0	17	18
10:00	0	0	4	0	0	0	0	0	4	4
10:15	0	0	4	0	1	0	0	0	5	5
10:30	0	0	5	0	0	0	0	0	5	5
10:45	0	0	7	0	0	0	0	0	7	7
H/TOT	0	0	20	0	1	0	0	0	21	21
11:00	0	0	9	0	1	0	0	0	10	10
11:15	0	0	6	0	0	0	0	0	6	6
11:30	0	0	6	0	1	0	0	0	7	7
11:45	0	0	6	0	1	0	0	0	7	7
H/TOT	0	0	27	0	3	0	0	0	30	30
12:00	1	0	8	0	0	0	0	0	9	8.2
12:15	0	0	10	0	2	0	0	0	12	12
12:30	0	0	9	0	2	0	0	0	11	11
12:45	0	0	10	0	2	0	0	0	12	12
H/TOT	1	0	37	0	6	0	0	0	44	43.2
13:00	0	0	14	0	2	1	0	0	17	17.5
13:15	0	0	7	0	0	0	0	0	7	7
13:30	0	0	5	0	0	1	0	0	6	6.5
13:45	1	0	5	0	0	0	0	0	6	5.2
H/TOT	1	0	31	0	2	2	0	0	36	36.2
14:00	0	0	8	0	1	0	0	0	9	9
14:15	0	1	15	0	1	0	0	0	17	16.4
14:30	0	0	8	0	2	2	0	0	12	13
14:45	0	0	12	0	3	0	0	0	15	15
H/TOT	0	1	43	0	7	2	0	0	53	53.4
15:00	0	0	6	0	0	0	1	0	7	8.3
15:15	0	0	8	0	0	0	0	0	8	8
15:30	0	0	4	0	0	0	0	0	4	4
15:45	0	0	7	0	2	1	0	0	10	10.5
H/TOT	0	0	25	0	2	1	1	0	29	30.8
16:00	0	0	12	0	0	0	0	0	12	12
16:15	0	0	10	0	0	0	0	0	10	10
16:30	0	0	10	0	1	0	0	0	11	11
16:45	0	0	10	0	1	0	0	0	11	11
H/TOT	0	0	42	0	2	0	0	0	44	44
17:00	0	0	13	0	2	0	0	0	15	15
17:15	0	0	21	0	2	1	0	0	24	24.5
17:30	0	1	9	0	1	0	0	0	11	10.4
17:45	0	0	9	0	1	0	1	0	11	12.3
H/TOT	0	1	52	0	6	1	1	0	61	62.2
18:00	1	0	10	0	2	0	0	0	13	12.2
18:15	0	0	11	0	2	0	0	0	13	13
18:30	1	0	8	0	3	1	0	0	13	12.7
18:45	0	0	9	0	2	0	0	0	11	11
H/TOT	2	0	38	0	9	1	0	0	50	48.9
19:00	1	0	9	0	1	0	0	0	11	10.2
19:15	0	0	8	0	1	0	0	0	9	9
19:30	0	0	14	0	1	0	0	0	15	15
19:45	0	0	8	0	0	0	0	0	8	8
H/TOT	1	0	39	0	3	0	0	0	43	42.2
20:00	1	0	11	0	1	1	0	0	14	13.7

A => C

TIME	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU
06:00	0	0	0	0	0	0	0	0	0	0
06:15	0	0	0	0	0	0	0	0	0	0
06:30	0	0	1	0	0	0	0	0	1	1
06:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	0	1	1
07:00	0	0	2	0	0	0	0	0	2	2
07:15	0	0	0	0	0	0	0	0	0	0
07:30	0	0	2	0	0	0	1	0	3	4.3
07:45	0	0	2	0	2	0	0	0	4	4
H/TOT	0	0	6	0	2	0	1	0	9	10.3
08:00	0	0	2	0	0	0	0	0	2	2
08:15	0	0	3	0	0	2	0	0	5	6
08:30	1	0	5	0	2	0	0	0	8	7.2
08:45	0	0	5	0	1	0	0	0	6	6
H/TOT	1	0	15	0	3	2	0	0	21	21.2
09:00	0	0	1	0	0	1	0	0	2	2.5
09:15	1	0	1	0	1	0	0	0	3	2.2
09:30	0	0	5	0	1	0	0	0	6	6
09:45	0	0	12	0	0	1	0	0	13	13.5
H/TOT	1	0	19	0	2	2	0	0	24	24.2
10:00	0	0	9	0	1	2	0	0	12	13
10:15	0	0	4	0	1	0	0	0	5	5
10:30	0	0	3	0	1	0	0	0	4	4
10:45	2	0	3	0	1	1	1	0	8	8.2
H/TOT	2	0	19	0	4	3	1	0	29	30.2
11:00	0	0	4	0	3	0	0	0	7	7
11:15	0	0	6	0	2	1	0	0	9	9.5
11:30	0	0	5	0	0	1	0	0	6	6.5
11:45	0	0	11	0	2	0	0	0	13	13
H/TOT	0	0	26	0	7	2	0	0	35	36
12:00	0	0	7	0	0	0	0	0	7	7
12:15	1	0	5	0	1	1	0	0	8	7.7
12:30	1	0	6	0	1	0	0	0	8	7.2
12:45	0	0	10	0	0	1	0	0	11	11.5
H/TOT	2	0	28	0	2	2	0	0	34	33.4
13:00	0	0	11	0	0	0	0	0	11	11
13:15	0	0	9	0	1	0	0	0	10	10
13:30	0	0	8	0	1	0	1	0	10	11.3
13:45	0	0	7	0	3	0	0	0	10	10
H/TOT	0	0	35	0	5	0	1	0	41	42.3
14:00	1	0	14	0	3	0	0	0	18	17.2
14:15	0	0	7	0	0	1	0	0	8	8.5
14:30	0	0	7	0	1	0	0	0	8	8
14:45	2	0	8	0	0	1	0	0	11	9.9
H/TOT	3	0	36	0	4	2	0	0	45	43.6
15:00	0	0	11	0	2	1	0	0	14	14.5
15:15	0	0	8	0	2	0	0	0	10	10
15:30	0	0	9	0	2	0	0	0	11	11
15:45	0	0	7	0	2	0	1	0	10	11.3
H/TOT	0	0	35	0	8	1	1	0	45	46.8
16:00	0	0	13	0	3	1	0	0	17	17.5
16:15	0	0	10	0	1	0	0	0	11	11
16:30	0	0	12	0	4	1	0	0	17	17.5
16:45	1	0	19	0	3	0	0	0	23	22.2
H/TOT	1	0	54	0	11	2	0	0	68	68.2
17:00	0	0	10	0	1	0	0	0	11	11
17:15	0	0	8	0	2	0	0	0	10	10
17:30	0	0	13	0	2	0	0	0	15	15
17:45	0	0	10	0	2	0	0	0	12	12
H/TOT	0	0	41	0	7	0	0	0	48	48
18:00	0	0	18	0	4	1	0	0	23	23.5
18:15	0	0	11	0	1	0	0	0	12	12
18:30	0	0	9	0	0	0	0	0	9	9
18:45	0	0	9	0	0	1	0	0	10	10.5
H/TOT	0	0	47	0	5	2	0	0	54	55
19:00	0	0	10	0	4	0	0	0	14	14
19:15	1	0	12	0	0	1	0	0	14	13.7
19:30	9	0	7	0	1	1	0	0	18	11.3
19:45	0	0	6	0	0	0	0	0	6	6
H/TOT	10	0	35	0	5	2	0	0	52	45
20:00	2	0	6	0	0	0	0	0	8	6.4

B => A

TIME	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU
06:00	0	0	0	0	0	0	0	0	0	0
06:15	0	0	3	0	0	0	0	0	3	3
06:30	0	0	3	0	0	0	0	0	3	3
06:45	0	0	1	0	1	0	0	0	2	2
H/TOT	0	0	7	0	1	0	0	0	8	8
07:00	0	0	3	0	2	0	0	0	5	5
07:15	0	0	7	0	1	0	0	0	8	8
07:30	0	0	2	0	1	1	0	0	4	4.5
07:45	0	0	7	0	2	0	0	0	9	9
H/TOT	0	0	19	0	6	1	0	0	26	26.5
08:00	0	0	6	0	2	0	0	0	8	8
08:15	0	0	5	0	1	0	0	0	6	6
08:30	0	0	4	0	1	1	0	0	6	6.5
08:45	0	0	6	0	0	0	0	0	6	6
H/TOT	0	0	21	0	4	1	0	0	26	26.5
09:00	0	0	2	0	1	0	0	0	3	3
09:15	0	0	5	0	2	0	0	0	7	7
09:30	0	0	9	0	0	1	0	0	10	10.5
09:45	0	0	7	0	1	0	0	0	8	8
H/TOT	0	0	23	0	4	1	0	0	28	28.5
10:00	0	0	5	0	1	0	0	0	6	6
10:15	0	0	5	0	1	0	0	0	6	6
10:30	0	0	14	0	0	0	0	0	14	14
10:45	0	0	6	0	0	0	0	0	6	6
H/TOT	0	0	30	0	2	0	0	0	32	32
11:00	0	1	6	0	1	1	0	1	10	10.9
11:15	1	0	8	0	0	0	1	0	10	10.5
11:30	0	0	7	0	1	0	0	0	8	8
11:45	0	0	10	0	1	1	2	0	14	17.1
H/TOT	1	1	31	0	3	2	3	1	42	46.5
12:00	0	0	8	0	3	0	0	0	11	11
12:15	0	0	8	0	1	0	0	0	9	9
12:30	0	0	6	0	1	0	0	0	7	7
12:45	1	0	4	0	2	0	0	0	7	6.2
H/TOT	1	0	26	0	7	0	0	0	34	33.2
13:00	0	0	8	0	0	0	0	0	8	8
13:15	0	0	10	0	0	0	0	0	10	10
13:30	1	0	12	0	0	0	0	0	13	12.2
13:45	1	0	5	0	1	0	0	0	7	6.2
H/TOT	2	0	35	0	1	0	0	0	38	36.4
14:00	0	0	10	0	0	0	0	0	10	10
14:15	1	0	11	0	0	1	0	0	13	12.7
14:30	0	0	5	0	1	0	1	0	7	8.3
14:45	0	0	9	0	0	0	0	0	9	9
H/TOT	1	0	35	0	1	1	1	0	39	40
15:00	0	0	4	0	0	1	0	0	5	5.5
15:15	0	0	9	0	1	1	0	0	11	11.5
15:30	0	0	6	0	0	0	0	0	6	6
15:45	0	0	2	0	2	0	0	0	4	4
H/TOT	0	0	21	0	3	2	0	0	26	27
16:00	0	0	2	0	0	1	0	0	3	3.5
16:15	0	0	4	0	1	0	0	0	5	5
16:30	0	0	6	0	2	0	0	0	8	8
16:45	0	0	7	0	2	0	0	0	9	9
H/TOT	0	0	19	0	5	1	0	0	25	25.5
17:00	0	0	13	0	2	0	0	0	15	15
17:15	1	0	7	0	1	0	1	0	10	10.5
17:30	0	0	7	0	2	1	0	0	10	10.5
17:45	0	0	6	0	1	0	0	0	7	7
H/TOT	1	0	33	0	6	1	1	0	42	43
18:00	0	0	11	0	1	0	0	0	12	12
18:15	0	0	6	0	2	1	0	0	9	9.5
18:30	0	0	9	0	1	0	0	0	10	10
18:45	1	0	9	0	1	0	0	0	11	10.2
H/TOT	1	0	35	0	5	1	0	0	42	41.7
19:00	3	0	11	0	2	0	0	0	16	13.6
19:15	0	0	8	0	2	0	0	0	10	10
19:30	0	0	4	0	1	0	0	0	5	5
19:45	2	0	13	0	1	0	0	0	16	14.4
H/TOT	5	0	36	0	6	0	0	0	47	43
20:00	0	0	5	0	2	0	0	0	7	7

B => B

TIME	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU
06:00	0	0	0	0	0	0	0	0	0	0
06:15	0	0	0	0	0	0	0	0	0	0
06:30	0	0	0	0	0	0	0	0	0	0
06:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
07:00	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
19:00	0	0	0	0	0	0	0	0	0	0
19:15	0	0	0	0	0	0	0	0	0	0
19:30	0	0	0	0	0	0	0	0	0	0
19:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
20:00	0	0	0	0	0	0	0	0	0	0

B => C

TIME	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU
06:00	0	0	0	0	0	0	0	0	0	0
06:15	0	0	0	0	0	0	0	0	0	0
06:30	0	0	1	0	0	0	0	0	1	1
06:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	2	0	0	0	0	0	2	2
07:00	0	0	0	0	0	0	0	0	0	0
07:15	0	0	1	0	0	0	0	0	1	1
07:30	0	0	1	0	1	0	0	0	2	2
07:45	0	0	4	0	0	0	0	0	4	4
H/TOT	0	0	6	0	1	0	0	0	7	7
08:00	0	0	1	0	1	0	0	0	2	2
08:15	0	0	3	0	0	0	0	0	3	3
08:30	0	0	3	0	0	0	0	0	3	3
08:45	0	0	3	0	0	0	0	0	3	3
H/TOT	0	0	10	0	1	0	0	0	11	11
09:00	0	0	5	0	0	0	0	0	5	5
09:15	0	0	3	0	0	0	0	0	3	3
09:30	0	0	0	0	0	0	1	0	1	2.3
09:45	0	0	2	0	0	0	0	0	2	2
H/TOT	0	0	10	0	0	0	1	0	11	12.3
10:00	0	0	4	0	0	0	1	0	5	6.3
10:15	0	0	4	0	0	0	0	0	4	4
10:30	0	0	1	0	0	0	1	0	2	3.3
10:45	1	0	0	0	0	0	0	0	1	0.2
H/TOT	1	0	9	0	0	0	2	0	12	13.8
11:00	0	0	3	0	0	0	0	0	3	3
11:15	0	0	2	0	0	0	0	0	2	2
11:30	0	0	3	0	1	1	0	0	5	5.5
11:45	0	0	1	0	1	0	0	0	2	2
H/TOT	0	0	9	0	2	1	0	0	12	12.5
12:00	0	0	2	0	0	0	0	0	2	2
12:15	0	0	3	0	1	0	0	0	4	4
12:30	0	0	3	0	0	1	0	0	4	4.5
12:45	0	0	4	0	3	0	0	0	7	7
H/TOT	0	0	12	0	4	1	0	0	17	17.5
13:00	1	0	3	0	1	0	0	0	5	4.2
13:15	0	0	4	0	0	0	0	0	4	4
13:30	0	0	4	0	0	0	0	0	4	4
13:45	0	0	4	0	1	0	0	0	5	5
H/TOT	1	0	15	0	2	0	0	0	18	17.2
14:00	0	0	7	0	0	0	0	0	7	7
14:15	0	0	4	0	0	0	0	0	4	4
14:30	0	0	7	0	0	1	0	0	8	8.5
14:45	1	0	4	0	0	0	0	0	5	4.2
H/TOT	1	0	22	0	0	1	0	0	24	23.7
15:00	0	0	2	0	0	0	0	0	2	2
15:15	0	0	0	0	0	0	0	0	0	0
15:30	0	0	2	0	0	1	0	0	3	3.5
15:45	0	0	4	0	0	0	0	0	4	4
H/TOT	0	0	8	0	0	1	0	0	9	9.5
16:00	0	0	3	0	0	0	0	0	3	3
16:15	0	0	4	0	0	0	0	0	4	4
16:30	0	1	3	0	0	0	0	0	4	3.4
16:45	0	0	4	0	2	0	0	0	6	6
H/TOT	0	1	14	0	2	0	0	0	17	16.4
17:00	0	0	7	0	0	0	0	0	7	7
17:15	0	0	5	0	0	0	0	0	5	5
17:30	0	0	4	0	0	0	0	0	4	4
17:45	0	0	2	0	0	0	0	0	2	2
H/TOT	0	0	18	0	0	0	0	0	18	18
18:00	0	0	3	0	0	0	0	0	3	3
18:15	1	0	5	0	0	0	0	0	6	5.2
18:30	0	0	0	0	1	0	0	0	1	1
18:45	0	0	3	0	1	1	0	0	5	5.5
H/TOT	1	0	11	0	2	1	0	0	15	14.7
19:00	0	0	2	0	0	0	0	0	2	2
19:15	0	0	3	0	0	0	0	0	3	3
19:30	0	0	1	0	0	0	0	0	1	1
19:45	0	0	2	0	0	0	0	0	2	2
H/TOT	0	0	8	0	0	0	0	0	8	8
20:00	1	0	1	0	0	0	0	0	2	1.2

C => A

TIME	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU
06:00	0	0	1	0	1	0	0	0	2	2
06:15	0	0	2	0	0	0	0	0	2	2
06:30	0	0	4	0	0	0	0	0	4	4
06:45	0	0	4	0	0	1	0	0	5	5.5
H/TOT	0	0	11	0	1	1	0	0	13	13.5
07:00	0	1	6	0	3	1	0	0	11	10.9
07:15	0	0	1	0	4	0	0	0	5	5
07:30	0	0	6	0	1	0	0	0	7	7
07:45	0	0	5	0	3	0	0	0	8	8
H/TOT	0	1	18	0	11	1	0	0	31	30.9
08:00	0	0	7	0	1	1	0	0	9	9.5
08:15	0	0	5	0	3	1	0	0	9	9.5
08:30	1	0	5	0	1	1	0	0	8	7.7
08:45	0	0	15	0	2	0	1	0	18	19.3
H/TOT	1	0	32	0	7	3	1	0	44	46
09:00	1	0	5	0	2	2	1	0	11	12.5
09:15	0	0	8	0	2	1	0	0	11	11.5
09:30	0	0	6	0	3	0	0	0	9	9
09:45	0	0	9	0	0	0	0	0	9	9
H/TOT	1	0	28	0	7	3	1	0	40	42
10:00	0	0	7	0	0	1	1	0	9	10.8
10:15	0	0	7	0	2	0	0	0	9	9
10:30	0	0	8	0	3	1	0	0	12	12.5
10:45	0	0	6	0	1	0	0	0	7	7
H/TOT	0	0	28	0	6	2	1	0	37	39.3
11:00	0	0	10	0	1	0	0	0	11	11
11:15	0	0	2	0	1	0	1	0	4	5.3
11:30	0	0	5	0	1	0	0	0	6	6
11:45	0	0	7	0	1	1	0	0	9	9.5
H/TOT	0	0	24	0	4	1	1	0	30	31.8
12:00	0	0	7	0	4	1	0	0	12	12.5
12:15	0	0	7	0	0	0	1	0	8	9.3
12:30	1	0	4	0	3	0	0	0	8	7.2
12:45	0	0	7	0	1	1	0	0	9	9.5
H/TOT	1	0	25	0	8	2	1	0	37	38.5
13:00	0	0	7	0	0	1	0	0	8	8.5
13:15	1	0	8	0	0	0	0	0	9	8.2
13:30	0	0	7	0	0	0	0	0	7	7
13:45	0	0	6	0	0	0	0	0	6	6
H/TOT	1	0	28	0	0	1	0	0	30	29.7
14:00	0	0	5	0	1	0	1	0	7	8.3
14:15	1	0	10	0	0	1	0	0	12	11.7
14:30	0	0	4	0	0	0	0	0	4	4
14:45	0	0	11	0	1	0	0	0	12	12
H/TOT	1	0	30	0	2	1	1	0	35	36
15:00	0	3	5	0	0	0	0	0	8	6.2
15:15	0	0	3	0	1	1	0	0	5	5.5
15:30	0	0	8	0	2	0	0	0	10	10
15:45	1	0	10	0	2	0	0	0	13	12.2
H/TOT	1	3	26	0	5	1	0	0	36	33.9
16:00	0	0	8	0	5	1	1	0	15	16.8
16:15	0	0	6	0	1	0	0	0	7	7
16:30	0	0	9	0	2	0	0	0	11	11
16:45	0	0	14	0	0	0	0	0	14	14
H/TOT	0	0	37	0	8	1	1	0	47	48.8
17:00	0	0	9	0	1	1	0	0	11	11.5
17:15	0	0	10	0	1	0	0	0	11	11
17:30	1	0	6	0	0	0	0	0	7	6.2
17:45	0	0	6	0	1	1	0	0	8	8.5
H/TOT	1	0	31	0	3	2	0	0	37	37.2
18:00	2	0	9	0	0	0	0	0	11	9.4
18:15	0	0	9	0	0	0	0	0	9	9
18:30	0	0	5	0	1	0	0	0	6	6
18:45	1	0	5	0	0	2	0	0	8	8.2
H/TOT	3	0	28	0	1	2	0	0	34	32.6
19:00	0	0	9	0	2	0	0	0	11	11
19:15	0	0	6	0	1	0	0	0	7	7
19:30	0	0	5	1	1	0	0	0	7	7
19:45	2	0	5	0	1	0	0	0	8	6.4
H/TOT	2	0	25	1	5	0	0	0	33	31.4
20:00	0	0	7	0	0	0	0	0	7	7

C => B

TIME	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU
06:00	0	0	1	0	0	0	0	0	1	1
06:15	0	0	0	0	1	0	0	0	1	1
06:30	0	0	0	0	0	1	0	0	1	1.5
06:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	2	0	1	1	0	0	4	4.5
07:00	0	0	0	1	0	0	0	0	1	1
07:15	0	0	1	0	0	0	0	0	1	1
07:30	0	0	0	0	0	0	0	0	0	0
07:45	0	0	1	0	1	0	0	0	2	2
H/TOT	0	0	2	1	1	0	0	0	4	4
08:00	0	0	5	0	0	0	0	0	5	5
08:15	0	0	4	0	0	0	0	0	4	4
08:30	0	0	2	0	0	0	0	0	2	2
08:45	0	0	5	0	0	0	0	0	5	5
H/TOT	0	0	16	0	0	0	0	0	16	16
09:00	2	0	2	0	0	0	0	0	4	2.4
09:15	0	0	2	0	0	0	0	0	2	2
09:30	1	0	2	0	0	0	0	0	3	2.2
09:45	0	0	4	0	0	0	0	0	4	4
H/TOT	3	0	10	0	0	0	0	0	13	10.6
10:00	0	0	1	0	1	0	0	0	2	2
10:15	0	0	4	0	0	1	0	0	5	5.5
10:30	0	0	4	0	0	0	0	0	4	4
10:45	0	0	4	0	1	0	1	0	6	7.3
H/TOT	0	0	13	0	2	1	1	0	17	18.8
11:00	0	0	3	0	0	0	0	0	3	3
11:15	0	0	5	0	0	0	0	0	5	5
11:30	0	0	0	0	0	0	0	0	0	0
11:45	0	0	3	0	0	0	0	0	3	3
H/TOT	0	0	11	0	0	0	0	0	11	11
12:00	0	0	5	0	1	0	0	0	6	6
12:15	0	0	6	0	0	0	0	0	6	6
12:30	0	0	1	0	0	0	0	0	1	1
12:45	0	0	3	0	0	0	0	0	3	3
H/TOT	0	0	15	0	1	0	0	0	16	16
13:00	0	0	7	0	1	0	0	0	8	8
13:15	0	0	3	0	1	0	0	0	4	4
13:30	0	0	1	0	0	0	0	0	1	1
13:45	0	0	4	0	0	0	0	0	4	4
H/TOT	0	0	15	0	2	0	0	0	17	17
14:00	0	0	5	0	0	0	0	0	5	5
14:15	0	0	6	0	1	0	0	0	7	7
14:30	0	0	0	0	0	1	0	0	1	1.5
14:45	0	0	2	0	1	0	0	0	3	3
H/TOT	0	0	13	0	2	1	0	0	16	16.5
15:00	0	0	3	0	0	0	0	0	3	3
15:15	0	0	1	0	0	0	0	0	1	1
15:30	0	0	2	0	0	0	0	0	2	2
15:45	0	0	3	0	0	0	0	0	3	3
H/TOT	0	0	9	0	0	0	0	0	9	9
16:00	0	0	2	0	0	0	0	0	2	2
16:15	0	0	3	0	0	0	0	0	3	3
16:30	0	0	3	0	1	0	0	0	4	4
16:45	1	0	7	0	0	0	0	0	8	7.2
H/TOT	1	0	15	0	1	0	0	0	17	16.2
17:00	0	0	3	0	0	0	0	0	3	3
17:15	0	0	2	0	0	0	0	0	2	2
17:30	0	0	1	0	0	0	0	0	1	1
17:45	0	0	5	0	0	0	0	0	5	5
H/TOT	0	0	11	0	0	0	0	0	11	11
18:00	0	0	2	0	3	0	0	0	5	5
18:15	1	0	3	0	0	0	0	0	4	3.2
18:30	0	0	2	0	0	0	0	0	2	2
18:45	0	0	3	0	1	0	0	0	4	4
H/TOT	1	0	10	0	4	0	0	0	15	14.2
19:00	0	0	4	0	0	0	0	0	4	4
19:15	0	0	1	0	1	0	0	0	2	2
19:30	0	0	1	0	2	0	0	0	3	3
19:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	7	0	3	0	0	0	10	10
20:00	0	0	0	0	0	0	0	0	0	0

C => C

TIME	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU
06:00	0	0	0	0	0	0	0	0	0	0
06:15	0	0	0	0	0	0	0	0	0	0
06:30	0	0	0	0	0	0	0	0	0	0
06:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
07:00	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0
09:30	0	0	1	0	0	0	0	0	1	1
09:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	0	1	1
10:00	0	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
19:00	0	0	0	0	0	0	0	0	0	0
19:15	0	0	0	0	0	0	0	0	0	0
19:30	0	0	0	0	0	0	0	0	0	0
19:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
20:00	0	0	0	0	0	0	0	0	0	0

20:15	0	0	0	0	0	0	0	0	0	0	0	0	4	0	3	0	0	0	7	7	0	1	5	0	0	0	0	0	6	5.4
20:30	0	0	0	0	0	0	0	0	0	0	0	0	7	0	1	0	0	0	8	8	1	0	7	0	2	0	0	0	10	9.2
20:45	0	0	0	0	0	0	0	0	0	0	0	0	6	0	1	0	0	0	7	7	1	0	9	0	0	0	0	0	10	9.2
H/TOT	0	0	0	0	0	0	0	0	0	0	1	0	28	0	6	1	0	0	36	35.7	4	1	27	0	2	0	0	0	34	30.2
21:00	0	0	0	0	0	0	0	0	0	0	0	0	11	0	1	0	0	0	12	12	0	0	7	0	0	1	0	0	8	8.5
21:15	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	8	8	0	0	7	0	1	0	0	0	8	8
21:30	0	0	0	0	0	0	0	0	0	0	1	0	5	0	1	0	0	0	7	6.2	0	0	6	0	0	0	0	0	6	6
21:45	0	0	0	0	0	0	0	0	0	0	1	0	4	0	0	0	0	0	5	4.2	0	0	4	0	0	0	0	0	4	4
H/TOT	0	0	0	0	0	0	0	0	0	0	2	0	28	0	2	0	0	0	32	30.4	0	0	24	0	1	1	0	0	26	26.5
16 TOT	0	0	2	0	0	0	0	0	2	2	8	2	451	0	55	11	2	0	529	530	24	1	448	0	68	21	4	0	566	562

20:15	0	0	4	0	1	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	2	1.2
20:30	2	0	8	0	0	0	0	0	10	8.4	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2
20:45	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
H/TOT	2	0	19	0	3	0	0	0	24	22.4	0	0	0	0	0	0	0	0	0	0	2	0	5	0	0	0	0	0	7	5.4
21:00	0	0	5	0	2	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	3
21:15	0	0	8	0	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21:30	1	0	9	0	0	0	0	0	10	9.2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
21:45	1	0	2	0	0	0	0	0	3	2.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	2	0	24	0	2	0	0	0	28	26.4	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	4	4
16 TOT	16	1	414	0	59	11	5	1	507	507	0	0	0	0	0	0	0	0	0	0	6	1	163	0	14	5	3	0	192	193

20:15	0	0	3	0	0	0	0	0	3	3	0	0	2	0	1	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0
20:30	0	0	3	0	0	0	0	0	3	3	2	1	0	0	0	0	0	0	3	0.8	0	0	0	0	0	0	0	0	0	0
20:45	0	5	0	0	1	0	0	0	6	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	5	13	0	1	0	0	0	19	16	2	1	2	0	1	0	0	0	6	3.8	0	0	0	0	0	0	0	0	0	0
21:00	0	0	4	0	1	0	0	0	5	5	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
21:15	0	0	6	0	0	0	0	0	6	6	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
21:30	0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21:45	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	15	0	1	0	0	0	16	16	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
16 TOT	12	9	399	1	70	21	7	0	519	524	7	1	153	1	18	3	1	0	184	181	0	0	1	0	0	0	0	0	1	1

IDASO

Survey Name: 087 20172 Ashford

Site: Site 3

Location: Aishleigh / Ashford Downs

Date: Tue 30-Jun-2020

TIME	A => A P/C	M/C	CAR	TAXI	LGV	HGV1	HGV2	PSV	TOT	PCU	A => B P/C	M/C	CAR	TAXI	LGV	HGV1	HGV2	PSV	TOT	PCU	A => C P/C	M/C	CAR	TAXI	LGV	HGV1	HGV2	PSV	TOT	PCU
06:00	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
06:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
06:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
06:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	2	2
07:00	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	1	1
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	3	3
07:45	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	3	3	0	0	4	0	3	0	0	0	7	7
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	3	0	2	0	0	0	5	5	0	0	7	0	4	0	0	0	11	11
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	4	0	0	0	7	7
08:15	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	4	4	0	0	2	0	1	1	0	0	4	4.5
08:30	0	0	0	0	0	0	0	0	0	0	0	0	3	0	2	0	0	0	5	5	0	0	4	0	1	0	0	0	5	5
08:45	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	2	0	1	0	0	0	3	3
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	6	0	4	0	0	0	10	10	0	0	11	0	7	1	0	0	19	19.5
09:00	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	4	4	0	0	3	0	0	0	0	0	3	3
09:15	0	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0	0	0	5	5	0	0	3	0	0	0	1	0	4	5.3
09:30	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2	2	0	0	2	0	0	0	0	0	2	2
09:45	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2	0	0	3	0	0	0	0	0	3	3
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	11	0	2	0	0	0	13	13	0	0	11	0	0	0	1	0	12	13.
10:00	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	6	6	0	0	5	0	1	0	1	0	7	8.3
10:15	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	1	0	0	8	8.5	0	0	6	0	0	0	0	0	6	6
10:30	0	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0	0	0	5	5	0	0	6	0	0	0	0	0	6	6
10:45	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	4	4	1	0	3	0	0	0	0	0	4	3.2
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	21	0	1	1	0	0	23	23.	1	0	20	0	1	0	1	0	23	23.
11:00	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	1	4	5	0	0	6	0	0	0	0	0	6	6
11:15	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2	0	0	4	0	0	0	1	0	5	6.3
11:30	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	0	4	4	0	0	4	0	2	1	0	0	7	7.5
11:45	0	0	0	0	0	0	0	0	0	0	0	0	8	1	0	0	0	0	9	9	0	0	6	0	1	1	2	0	10	13.
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	16	1	1	0	0	1	19	20	0	0	20	0	3	2	3	0	28	32.
12:00	0	0	0	0	0	0	0	0	0	0	1	0	3	0	1	0	0	0	5	4.2	0	0	5	0	2	0	0	0	7	7
12:15	0	0	0	0	1	0	0	0	1	1	0	0	3	0	0	0	0	1	4	5	0	0	6	0	1	0	0	0	7	7
12:30	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	3	0	0	5	0	0	1	0	0	6	6.5
12:45	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	5	5	0	0	6	0	3	0	0	0	9	9
H/TOT	0	0	0	0	1	0	0	0	1	1	1	0	14	0	1	0	0	1	17	17.2	0	0	22	0	6	1	0	0	29	29.
13:00	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	7	7	1	0	12	0	1	0	0	0	14	13.
13:15	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	4	4	0	0	8	0	0	0	0	0	8	8
13:30	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	1	0	8	0	0	0	0	0	9	8.2
13:45	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2	0	0	8	0	1	0	0	0	9	9
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	13	1	0	0	0	0	14	14	2	0	36	0	2	0	0	0	40	38.
14:00	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2	0	0	11	0	0	0	0	0	11	11
14:15	0	0	0	0	0	0	0	0	0	0	1	0	6	0	0	0	0	0	7	6.2	0	0	14	0	0	0	0	0	14	14
14:30	0	0	0	0	0	0	0	0	0	0	2	0	5	0	0	0	0	0	7	5.4	0	0	9	0	0	0	1	1	11	12.
14:45	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	1	0	0	4	4.5	1	0	4	0	0	0	0	0	5	4.2
H/TOT	0	0	0	0	0	0	0	0	0	0	3	0	16	0	0	1	0	0	20	18.	1	0	38	0	0	0	1	1	41	42
15:00	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	9	9	0	0	1	0	1	0	0	0	2	2.5
15:15	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	5	5	0	0	4	0	1	0	0	0	5	5
15:30	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	10	10	0	0	4	0	1	1	0	0	6	6.5
15:45	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	0	4	4	0	0	3	0	0	0	0	0	3	3
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	27	0	1	0	0	0	28	28	0	0	12	0	2	2	0	0	16	17
16:00	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	0	4	4	0	0	5	0	0	1	0	0	6	6.5
16:15	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2	0	0	5	0	1	0	0	0	6	6
16:30	0	0	0	0	0	0	0	0	0	0	0	0	6	0	3	0	0	0	9	9	0	1	7	0	2	0	0	0	10	9.4
16:45	0	0	0	0	0	0	0	0	0	0	0	0	4	0	3	2	0	0	9	10	0	0	8	0	2	0	0	0	10	10
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	15	0	7	2	0	0	24	25	0	1	25	0	5	1	0	0	32	31.9
17:00	0	0	0	0	0	0	0	0	0	0	0	0	12	0	3	1	0	0	16	16.5	0	0	13	0	2	0	0	0	15	15
17:15	0	0	0	0	0	0	0	0	0	0	1	0	12	0	0	0	0	0	13	12.2	0	0	6	0	0	0	1	0	7	8.3
17:30	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	9	9	0	0	8	0	0	0	0	0	8	8
17:45	0	0	0	0	0	0	0	0	0	0	0	0	4	0	2	0	0	0	6	6	1	0	2	0	0	0	0	0	3	2.2
H/TOT	0	0	0	0	0	0	0	0	0	0	1	0	37	0	5	1	0	0	44	43.	1	0	29	0	2	0	1	0	33	33.5
18:00	0	0	0	0	0	0	0	0	0	0	2	0	6	0	1	0	0	0	9	7.4	0	0	5	0	0	0	0	0	5	5
18:15	0	0	0	0	0	0	0	0	0	0	0	0	9	0	1	0	0	0	10	10	1	0	7	0	3	0	0	0	11	10.2
18:30	0	0	0	0	0	0	0	0	0	0	0	0	9	0	1	1	0	0	11	11.5	0	0	2	0	1	0	0	0	3	3
18:45	0	0	0	0	0	0	0	0	0	0	2	0	4	0	1	0	0	0	7	5.4	0	0	4	0	1	0	0	0	5	5
H/TOT	0	0	0	0	0	0	0	0	0	0	4	0	28	0	4	1	0	0	37	34.	1	0	18	0	5	0	0	0	24	23.2
19:00	0	0	0	0	0	0	0	0	0	0	0	0	6	0	1	0	0	0	7	7	0	0	2	0	1	0	0	0	3	3
19:15	0	0	0	0	0	0	0	0	0	0	2	0	4	0	0	0	0	0	6	4.4	0	0	4	0	0	0	0	0	4	4
19:30	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	8	8	0	0	3	0	0	0	0	0	3	3
19:45	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	0	4	4	0	0	3	0	0	0	0	0	3	3
H/TOT	0	0	0	0	0	0	0	0	0	0	2	0	21	0	2	0	0	0	25	23.	0	0	12	0	1	0	0	0	13	13
20:00	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	5	5	1	0	2	0	0	0	0	0	3	2.2

TIME	B => A P/C	M/C	CAR	TAXI	LGV	HGV1	HGV2	PSV	TOT	PCU	B => B P/C	M/C	CAR	TAXI	LGV	HGV1	HGV2	PSV	TOT	PCU	B => C P/C	M/C	CAR	TAXI	LGV	HGV1	HGV2	PSV	TOT	PCU
06:00	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:15	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	3
06:30	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	3
06:45	0	0	2	0	1	1	0	0	4	4.5	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	3	3
H/TOT	0	0	6	0	1	1	0	0	8	8.5	0	0	0	0	0	0	0	0	0	0	0	0	8	0	1	0	0	0	9	9
07:00	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	3	0	2	0	0	0	5	5
07:15	0	0	0	0	2	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	7	0	2	0	0	0	9	9
07:30	1	0	6	0	1	0	0	0	8	7.2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	3	3.5
07:45	0	0	4	0	3	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	0	0	5	0	1	0	0	0	6	6
H/TOT	1	0	10	0	7	0	0	0	18	17.2	0	0	0	0	0	0	0	0	0	0	0	0	17	0	5	1	0	0	23	23.5
08:00	1	0	4	0	0	0	0	0	5	4.2	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	4	4
08:15	0	0	6	0	2	1	0	0	9	9.5	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	5	5
08:30	0	1	9	0	1	1	0	0	12	11.	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	3	3.5
08:45	0	0	8	0	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	6	6
H/TOT	1	1	27	0	3	2	0	0	34	33.	0	0	0	0	0	0	0	0	0	0	0	0	17	0	0	1	0	0	18	18.5
09:00	0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0	0	0	5	5
09:15	0	0	3	0	1	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	5	0	1	0	0	0	6	6
09:30	0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	1	0	0	6	6.5
09:45	0	0	8	0	1	1	0	0	10	10.	0	0	0	0	0	0	0	0	0	0	0	0	6	0	2	0	0	0	8	8
H/TOT	0	0	17	0	2	1	0	0	20	20.	0	0	0	0	0	0	0	0	0	0	0	0	20	0	4	1	0	0	25	25.5
10:00	1	0	6	0	1	0	0	0	8	7.2	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	3
10:15	0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	5	0	1	0	0	0	6	6
10:30	0	0	5	0	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	1	0	0	6	6.5
10:45	0	0	6	0	0	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	0	4	4
H/TOT	1	0	20	0	1	0	0	0	22	21.	0	0	0	0	0	0	0	0	0	0	0	0	16	0	2	1	0	0	19	19.5
11:00	0	0	8	0	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0	0	1	3	0	0	1	0	1	6	6.9
11:15	0	0	4	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	8	8
11:30	0	0	7	0	1	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0	0	0	6	0	1	0	0	0	7	7
11:45	0	0	3	1	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0	0	0	5	5
H/TOT	0	0	22	1	1	0	0	0	24	24	0	0	0	0	0	0	0	0	0	0	0	1	21	0	2	1	0	1	26	26.9
12:00	0	0	5	0	1	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	8	8
12:15	0	0	5	0	1	0	0	1	7	8	0	0	0	0	0	0	0	0	0	0	0	0	5	0	1	0	0	0	6	6
12:30	0	0	5	0	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0	0	0	5	5
12:45	0	0	8	0	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0	3	2.2
H/TOT	0	0	23	0	2	0	0	1	26	27	0	0	0	0	0	0	0	0	0	0	1	0	18	0	3	0	0	0	22	21.2
13:00	0	0	7	0	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2
13:15	0	0	8	1	0	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	5	5
13:30	1	0	3	0	0	0	0	0	4	3.2	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	7	7
13:45	1	0	4	0	0	1	0	0	6	5.7	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2	2
H/TOT	2	0	22	1	0	1	0	0	26	24.	0	0	0	0	0	0	0	0	0	0	0	0	15	0	1	0	0	0	16	16
14:00	0	0	4	0	0	1	0	0	5	5.5	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	8	8
14:15	0	0	6	0	0	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	3	2.2
14:30	0	0	5	0	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	5	0	1	0	0	0	6	6
14:45	0	0	7	0	2	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	5	5
H/TOT	0	0	22	0	2	1	0	0	25	25.5	0	0	0	0	0	0	0	0	0	0	1	0	20	0	1	0	0	0	22	21.2
15:00	0	0	4	0	1	1	0	0	6	6.5	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	5	5
15:15	0	0	5	0	1	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	1	0	0	7	7.5
15:30	0	0	4	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	0	4	4
15:45	0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	3	3
H/TOT	0	0	16	0	2	1	0	0	19	19.5	0	0	0	0	0	0	0	0	0	0	0	0	16	0	2	1	0	0	19	19.5
16:00	0	0	4	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
16:15	0	0	2	0	1	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2
16:30	0	0	6	0	1	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2
16:45	0	0	6	0	1	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	0	0	5	0	1	0	0	0	6	6
H/TOT	0	0	18	0	3	0	0	0	21	21	0	0	0	0	0	0	0	0	0	0	0	0	10	0	1	0	0	0	11	11
17:00	0	0	9	0	1	1	0	0	11	11.5	0	0	0	0	0	0	0	0	0	0	0	0	7	0	1	0	0	0	8	8
17:15	0	0	4	0	1	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	1	0	5	0	1	0	0	0	7	6.2
17:30	0	0	8	0	2	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0	0	0	4	0	1	1	0	0	6	6.5
17:45	1	0	10	0	0	0	0	0	11	10.2	0	0	0	0	0	0	0	0	0	0	1	0	6	0	1	0	0	0	8	7.2
H/TOT	1	0	31	0	4	1	0	0	37	36.7	0	0	0	0	0	0	0	0	0	0	2	0	22	0	4	1	0	0	29	27.9
18:00	1	0	6	0	0	0	0	0	7	6.2	0	0	0	0	0	0	0	0	0	0	0	0	7	0	1	0	0	0	8	8
18:15	1	0	3	0	2	0	0	0	6	5.2	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	1	0	0	4	4.5
18:30	0	0	11	0	0	0	0	0	11	11	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	8	8
18:45	2	0	8	0	0	0	0	0	10	8.4	0	0	0	0	0	0	0	0	0	0	1	0	9	0	1	1	0	0	12	11.7
H/TOT	4	0	28	0	2	0	0	0	34	30.8	0	0	0	0	0	0	0	0	0	0	1	0	27	0	2	2	0	0	32	32.2
19:00	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	8	0	1	0	0	0	9	9
19:15	0	0	6	0	0	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	6	0	2	0	0	0	8	8
19:30	1	0	4	0	0	0	0	0	5	4.2	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	4	4
19:45	0	0	11	0	1	0	0	0	12	12	0	0	0	0	0	0	0	0	0	0	2	0	11	0	2	0	0	0	15	13.4
H/TOT	1	0	22	0	1	0	0	0	24	23.2	0	0	0	0	0	0	0	0	0	0	2	0	29	0	5	0	0	0	36	34.4
20:00	1	0	2	0	0	0	0	0	3	2.2	0	0	0	0	0	0	0	0	0	0	0	0	6	0	1	0	0	0	7	7

TIME	C => A P/C	M/C	CAR	TAXI	LGV	HGV1	HGV2	PSV	TOT	PCU	C => B P/C	M/C	CAR	TAXI	LGV	HGV1	HGV2	PSV	TOT	PCU	C => C P/C	M/C	CAR	TAXI	LGV	HGV1	HGV2	PSV	TOT	PCU
06:00	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:15	0	0	0	0	2	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:30	0	0	0	0	1	1	0	0	2	2.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45	0	0	3	0	1	0	0	0	4	4	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	5	0	4	1	0	0	10	10.5	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
07:00	0	0	0	1	1	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	2	0	0	0	0	0	2	2	0	0	1	0	1	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
07:30	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45	0	0	2	0	1	0	0	0	3	3	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	5	1	2	0	0	0	8	8	0	0	2	0	1	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0
08:00	0	0	9	0	0	0	0	0	9	9	0	0	3	0	1	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0
08:15	0	0	5	0	1	0	0	0	6	6	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
08:30	0	0	3	0	0	0	0	0	3	3	0	0	2	0	1	1	0	0	4	4.5	0	0	0	0	0	0	0	0	0	0
08:45	0	0	7	0	0	0	0	0	7	7	0	0	6	0	0	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	24	0	1	0	0	0	25	25	0	0	13	0	2	1	0	0	16	16.5	0	0	0	0	0	0	0	0	0	0
09:00	2	0	2	0	0	0	0	0	4	2.4	0	0	0	0	0	1	0	0	1	1.5	0	0	0	0	0	0	0	0	0	0
09:15	0	0	6	0	1	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30	1	0	4	0	1	1	0	0	7	6.7	0	0	4	0	0	0	0	0	4	4	0	0	1	0	0	0	0	0	1	1
09:45	0	0	5	0	1	0	0	0	6	6	0	0	4	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0
H/TOT	3	0	17	0	3	1	0	0	24	22.1	0	0	8	0	0	1	0	0	9	9.5	0	0	1	0	0	0	0	0	1	1
10:00	0	0	1	0	1	0	0	0	2	2	0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0
10:15	0	0	7	0	0	0	0	0	7	7	0	0	3	0	1	1	0	0	5	5.5	0	0	0	0	0	0	0	0	0	0
10:30	0	0	7	0	0	0	0	0	7	7	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
10:45	0	0	6	0	0	0	1	0	7	8.3	0	0	5	0	1	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	21	0	1	0	1	0	23	24.3	0	0	12	0	2	1	0	0	15	15.5	0	0	0	0	0	0	0	0	0	0
11:00	0	0	8	0	1	0	0	0	9	9	0	0	5	0	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0
11:15	0	0	9	0	0	0	0	0	9	9	0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0
11:30	0	0	7	0	0	0	0	0	7	7	0	0	3	0	1	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0
11:45	0	0	7	0	0	0	1	0	8	9.3	0	0	4	0	1	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	31	0	1	0	1	0	33	34.3	0	0	15	0	2	0	0	0	17	17	0	0	0	0	0	0	0	0	0	0
12:00	0	0	6	0	0	0	0	0	6	6	1	0	5	0	1	0	0	0	7	6.2	0	0	0	0	0	0	0	0	0	0
12:15	0	0	12	0	0	0	0	0	12	12	0	0	6	0	2	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0
12:30	0	0	7	0	0	0	0	0	7	7	0	0	3	0	1	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0
12:45	0	0	8	0	1	0	0	0	9	9	0	0	5	0	1	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	33	0	1	0	0	0	34	34	1	0	19	0	5	0	0	0	25	24.2	0	0	0	0	0	0	0	0	0	0
13:00	0	0	10	0	2	0	0	0	12	12	0	0	12	0	1	1	0	0	14	14.5	0	0	0	0	0	0	0	0	0	0
13:15	0	0	6	0	0	0	0	0	6	6	0	0	4	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0
13:30	0	0	2	0	0	0	0	0	2	2	0	0	3	0	0	1	0	0	4	4.5	0	0	0	0	0	0	0	0	0	0
13:45	0	0	5	0	0	0	0	0	5	5	1	0	4	0	0	0	0	0	5	4.2	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	23	0	2	0	0	0	25	25	1	0	23	0	1	2	0	0	27	27.2	0	0	0	0	0	0	0	0	0	0
14:00	0	0	8	0	0	0	0	0	8	8	0	0	6	0	1	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0
14:15	0	0	12	0	1	0	0	0	13	13	0	1	8	0	0	0	0	0	9	8.4	0	0	0	0	0	0	0	0	0	0
14:30	0	0	2	0	0	1	0	0	3	3.5	0	0	5	0	2	2	0	0	9	10	0	0	0	0	0	0	0	0	0	0
14:45	0	0	4	0	3	0	0	0	7	7	0	0	9	0	1	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	26	0	4	1	0	0	31	31.5	0	1	28	0	4	2	0	0	35	35.4	0	0	0	0	0	0	0	0	0	0
15:00	0	0	6	0	0	0	1	0	7	8.3	0	0	5	0	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0
15:15	0	0	7	0	0	0	0	0	7	7	0	0	4	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0
15:30	0	0	2	0	0	0	0	0	2	2	0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0
15:45	0	0	4	0	0	1	0	0	5	5.5	0	0	5	0	2	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	19	0	0	1	1	0	21	22.8	0	0	17	0	2	0	0	0	19	19	0	0	0	0	0	0	0	0	0	0
16:00	0	0	5	0	0	0	0	0	5	5	0	0	8	0	1	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0
16:15	0	0	7	0	0	0	0	0	7	7	0	0	8	0	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0
16:30	0	0	4	0	0	0	0	0	4	4	0	0	5	0	1	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0
16:45	0	0	9	0	0	0	0	0	9	9	1	0	5	0	1	0	0	0	7	6.2	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	25	0	0	0	0	0	25	25	1	0	26	0	3	0	0	0	30	29.2	0	0	0	0	0	0	0	0	0	0
17:00	0	0	5	0	1	0	0	0	6	6	0	0	13	0	0	0	0	0	13	13	0	0	0	0	0	0	0	0	0	0
17:15	0	0	8	0	0	0	0	0	8	8	0	0	14	0	3	1	0	0	18	18.5	0	0	0	0	0	0	0	0	0	0
17:30	0	0	2	0	0	0	0	0	2	2	0	1	8	0	0	0	0	0	9	8.4	0	0	0	0	0	0	0	0	0	0
17:45	3	0	3	0	3	0	1	0	10	8.9	0	0	10	0	0	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0
H/TOT	3	0	18	0	4	0	1	0	26	24.9	0	1	45	0	3	1	0	0	50	49.9	0	0	0	0	0	0	0	0	0	0
18:00	0	0	3	0	3	0	0	0	6	6	0	0	8	0	1	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0
18:15	1	0	3	0	1	0	0	0	5	4.2	0	0	10	0	1	0	0	0	11	11	0	0	0	0	0	0	0	0	0	0
18:30	1	0	6	0	1	0	0	0	8	7.2	0	0	4	0	2	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0
18:45	0	0	7	0	1	0	0	0	8	8	0	0	4	0	2	1	0	0	7	7.5	0	0	0	0	0	0	0	0	0	0
H/TOT	2	0	19	0	6	0	0	0	27	25.4	0	0	26	0	6	1	0	0	33	33.5	0	0	0	0	0	0	0	0	0	0
19:00	0	0	6	0	0	0	0	0	6	6	1	0	6	0	1	0	0	0	8	7.2	0	0	1	0	0	0	0	0	1	1
19:15	0	0	4	0	0	0	0	0	4	4	0	0	6	0	0	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0
19:30	0	0	3	0	0	0	0	0	3	3	0	0	9	0	3	0	0	0	12	12	0	0	0	0	0	0	0	0	0	0
19:45	0	0	2	0	0	0	0	0	2	2	0	0	7	0	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	15	0	0	0	0	0	15	15	1	0	28	0	4	0	0	0	33	32.2	0	0	1	0	0	0	0	0	1	1
20:00	0	0	0	0	0	1	0	0	1	1.5	1	0	11	0	2	0	0	0	14	13.2	0	0	0	0	0	0	0	0	0	0

20:15	0	0	0	0	0	0	0	0	0	0	2	0	4	0	0	0	0	0	6	4.4	2	0	2	0	0	0	0	0	4	2.4
20:30	0	0	0	0	0	0	0	0	0	0	2	0	6	0	0	0	0	0	8	6.4	0	0	5	0	0	0	0	0	5	5
20:45	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	3	3.5	0	0	3	0	0	0	0	0	3	3
H/TOT	0	0	0	0	0	0	0	0	0	0	4	0	16	0	1	1	0	0	22	19.3	3	0	12	0	0	0	0	0	15	12.6
21:00	0	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0	0	0	5	5	0	0	4	0	1	0	0	0	5	5
21:15	0	0	0	0	0	0	0	0	0	0	1	0	5	0	0	0	0	0	6	5.2	0	0	4	0	0	0	0	0	4	4
21:30	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	1	0	0	4	3.7	0	0	2	0	0	0	0	0	2	2
21:45	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	2	0	12	0	1	1	0	0	16	14.9	0	0	10	0	1	0	0	0	11	11
16 TOT	0	0	0	0	1	0	0	0	1	1	17	0	257	2	32	8	0	2	318	310	9	1	285	0	39	8	7	0	349	354

20:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	3	3
20:30	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	5	5
20:45	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
H/TOT	1	0	5	0	0	0	0	0	6	5.2	0	0	0	0	0	0	0	0	0	0	0	0	13	0	3	0	0	0	16	16
21:00	1	0	3	0	1	0	0	0	5	4.2	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	5	5
21:15	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	4	4
21:30	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	1	0	7	0	0	0	0	0	8	7.2
21:45	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2
H/TOT	1	0	8	0	1	0	0	0	10	9.2	0	0	0	0	0	0	0	0	0	0	1	0	18	0	0	0	0	0	19	18.2
16 TOT	13	1	297	2	32	8	0	1	354	348	0	0	0	0	0	0	0	0	0	0	8	1	287	0	36	9	0	1	342	341

20:15	0	0	4	0	1	0	0	0	5	5	0	0	4	0	2	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0
20:30	2	1	0	0	0	0	0	0	3	0.8	0	0	7	0	1	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0
20:45	0	0	2	0	0	0	0	0	2	2	0	0	4	0	1	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0
H/TOT	2	1	6	0	1	1	0	0	11	9.3	1	0	26	0	6	0	0	0	33	32.2	0	0	0	0	0	0	0	0	0	0
21:00	0	0	4	0	0	0	0	0	4	4	0	0	8	0	1	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0
21:15	0	0	1	0	0	0	0	0	1	1	0	0	7	0	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0
21:30	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0
21:45	0	0	0	0	0	0	0	0	0	0	1	0	4	0	0	0	0	0	5	4.2	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	5	0	0	0	0	0	5	5	1	0	25	0	1	0	0	0	27	26.2	0	0	0	0	0	0	0	0	0	0
16 TOT	10	1	292	1	30	5	4	0	343	342	6	2	314	0	42	9	0	0	373	372	0	0	2	0	0	0	0	0	2	2

IDASO

Survey Name: 087 20172 Ashford

Site: Site 4

Location: Woodview / Unnamed Road

Date: Tue 30-Jun-2020

TIME	A => A P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU	A => B P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU	A => C P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU
06:00	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
06:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	1	1
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
08:00	0	0	2	0	1	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2	2
08:30	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	3	3	0	0	3	0	1	0	0	0	4	4
08:45	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2	0	0	2	0	1	0	0	0	3	3
H/TOT	0	0	2	0	1	0	0	0	3	3	0	0	4	0	1	0	0	0	5	5	0	0	6	0	3	0	0	0	9	9
09:00	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	3	0	0	1	0	0	0	0	0	1	1
09:15	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	4	0	0	0	0	0	4	4
09:30	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	3
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	6	6	0	0	8	0	0	0	0	0	8	8
10:00	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2	0	0	2	0	0	0	0	0	2	2
10:15	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	2	0	0	2	3	2	0	4	0	1	0	0	0	7	5.4
10:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	1	0	0	0	0	0	1	1
10:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	4	4
H/TOT	0	0	1	0	0	0	0	0	1	1	0	0	2	0	1	2	0	0	5	6	2	0	11	0	1	0	0	0	14	12.4
11:00	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	7	0	0	0	0	0	7	7
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2
11:30	1	0	0	0	0	0	0	0	1	0.2	0	0	1	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	2	2
11:45	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2	0	0	3	0	0	0	0	0	3	3
H/TOT	1	0	0	0	0	0	0	0	1	0.2	0	0	4	0	0	0	0	0	4	4	0	0	14	0	0	0	0	0	14	14
12:00	0	0	1	0	0	0	0	0	1	1	2	0	1	0	1	0	0	0	4	2.4	0	0	2	0	0	0	0	0	2	2
12:15	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2	2	0	0	4	0	1	0	0	0	5	5
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	4	4
12:45	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	3
H/TOT	0	0	2	0	0	0	0	0	2	2	2	0	2	0	2	0	0	0	6	4.4	0	0	13	0	1	0	0	0	14	14
13:00	0	0	1	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	2	2	0	0	9	0	0	0	0	0	9	9
13:15	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	3	2.7	0	0	3	0	0	0	0	0	3	3
13:30	0	0	1	0	0	0	0	0	1	1	1	0	1	0	0	1	0	0	3	2.7	2	0	0	0	0	0	0	0	2	0.4
13:45	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	4	0	0	0	0	0	4	4
H/TOT	0	0	2	0	0	0	0	0	2	2	2	0	4	1	0	2	0	0	9	8.4	2	0	16	0	0	0	0	0	18	16.4
14:00	0	0	1	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	1	1
14:15	0	0	0	0	0	0	0	0	0	0	2	1	1	0	0	0	0	0	4	1.8	0	0	3	0	0	0	0	0	3	3
14:30	0	0	1	0	0	0	0	0	1	1	1	0	1	0	0	0	0	0	2	1.2	1	0	3	0	0	0	0	0	4	3.2
14:45	0	0	2	0	0	0	0	0	2	2	1	0	2	0	0	2	0	0	5	5.2	0	0	2	0	0	0	0	0	2	2
H/TOT	0	0	4	0	0	0	0	0	4	4	4	1	5	0	0	2	0	0	12	9.2	1	0	9	0	0	0	0	0	10	9.2
15:00	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2	0	0	6	0	0	0	0	0	6	6
15:15	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2	0	0	4	0	0	0	0	0	4	4
15:30	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	3	2.2	0	0	6	0	0	0	0	0	6	6
15:45	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2	1	0	2	0	0	0	0	0	3	2.2
H/TOT	0	0	0	0	0	0	0	0	0	0	1	0	8	0	0	0	0	0	9	8.2	1	0	18	0	0	0	0	0	19	18.2
16:00	0	0	2	0	0	0	0	0	2	2	0	0	1	0	1	0	0	0	2	2	0	0	5	0	0	0	0	0	5	5
16:15	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	8	8
16:30	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	6	0	1	0	0	0	7	7
16:45	0	0	0	0	3	0	0	0	3	3	0	0	2	0	0	1	0	0	3	3.5	0	0	3	0	0	0	0	0	3	3
H/TOT	0	0	3	0	3	0	0	0	6	6	0	0	4	0	1	1	0	0	6	6.5	0	0	22	0	1	0	0	0	23	23
17:00	0	0	0	0	0	0	0	0	0	0	1	0	3	0	1	0	0	0	5	4.2	1	0	10	0	1	1	0	0	13	12.7
17:15	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	0	4	4	0	0	6	0	1	0	0	0	7	7
17:30	0	0	0	0	0	0	0	0	0	0	1	0	3	0	0	0	0	0	4	3.2	1	1	5	0	1	0	0	0	8	6.6
17:45	0	0	0	0	0	0	0	0	0	0	1	0	5	0	2	0	0	0	8	7.2	0	0	5	0	0	0	0	0	5	5
H/TOT	0	0	0	0	0	0	0	0	0	0	3	0	14	0	4	0	0	0	21	18.6	2	1	26	0	3	1	0	0	33	31.3
18:00	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	3	1	0	7	0	0	0	0	0	8	7.2
18:15	0	0	0	0	1	0	0	0	1	1	0	0	2	0	0	0	0	0	2	2	0	0	10	0	1	0	0	0	11	11
18:30	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	2	2.5	0	0	6	0	0	0	0	0	6	6
18:45	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0.2	2	0	6	0	0	1	0	0	9	7.9
H/TOT	0	0	0	0	1	0	0	0	1	1	1	0	6	0	0	1	0	0	8	7.7	3	0	29	0	1	1	0	0	34	32.1
19:00	0	0	1	0	0	0	0	0	1	1	1	0	2	0	0	0	0	0	3	2.2	8	0	5	0	2	0	0	0	15	8.6
19:15	0	0	1	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	1	1	1	0	2	0	0	0	0	0	3	2.2
19:30	0	0	1	0	0	0	0	0	1	1	1	0	5	0	0	0	0	0	6	5.2	2	0	6	0	2	0	0	0	10	8.4
19:45	0	0	2	0	0	0	0	0	2	2	0	0	3	0	0	0	0	0	3	3	0	0	5	0	1	0	0	0	6	6
H/TOT	0	0	5	0	0	0	0	0	5	5	2	0	11	0	0	0	0	0	13	11.4	11	0	18	0	5	0	0	0	34	25.2
20:00	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	3	0	0	6	0	1	0	0	0	7	7

TIME	B => A P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU	B => B P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU	B => C P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU
06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:15	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45	0	0	2	0	0	1	0	0	3	3.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	3	0	0	1	0	0	4	4.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	1	0	1	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	0	0	2	0	1	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	3	0	2	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	3	0	0	1	0	0	4	4.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30	0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	11	0	0	1	0	0	12	12.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00	0	0	2	0	1	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
09:30	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	4	0	2	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
10:00	1	0	2	0	1	0	0	0	4	3.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30	0	0	1	0	0	1	0	0	2	2.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45	0	1	1	0	0	0	0	0	2	1.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	1	1	4	0	2	1	0	0	9	8.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	1	0	0	1	1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	3	0	0	1	0	0	4	4.5	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
12:00	0	0	1	0	1	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15	0	0	2	0	1	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45	0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	6	0	2	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	0	1	1	0	0	0	0	2	2	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
13:30	2	0	4	0	0	0	0	0	6	4.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1.5
13:45	2	0	1	0	0	1	0	0	4	2.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	4	0	6	1	0	1	0	0	12	9.3	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	1	0	0	1	1.5
14:00	0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:15	1	0	1	0	0	0	0	0	2	1.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:30	1	0	3	0	0	0	0	0	4	3.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:45	0	0	1	0	1	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1.5
H/TOT	2	0	8	0	1	0	0	0	11	9.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1.5
15:00	1	0	1	0	0	0	0	0	2	1.2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0.2
15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0.2
15:30	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:45	1	0	0	0	0	0	0	0	1	0.2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0.2
H/TOT	2	0	2	0	0	0	0	0	4	2.4	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	3	0.6
16:00	1	0	1	0	0	0	0	0	2	1.2	1	0	0	0	0	0	0	0	1	0.2	2	0	0	0	0	0	0	0	2	0.4
16:15	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0.4	0	0	0	0	0	0	0	0	0	0
16:30	1	0	2	0	0	0	0	0	3	2.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	2	0	3	0	0	0	0	0	5	3.4	3	0	0	0	0	0	0	0	3	0.6	2	0	0	0	0	0	0	0	2	0.4
17:00	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	1	0	3	0	1	0	0	0	5	4.2	1	0	0	0	0	0	0	0	1	0.2	0	0	0	0	0	0	0	0	0	0
17:45	2	0	0	0	0	0	0	0	2	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	3	0	4	0	2	0	0	0	9	6.6	1	0	0	0	0	0	0	0	1	0.2	0	0	0	0	0	0	0	0	0	0
18:00	1	0	1	0	0	0	0	0	2	1.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15	1	0	1	0	0	0	0	0	2	1.2	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	3	1.4
18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:45	0	0	4	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0.4
H/TOT	2	0	6	0	0	0	0	0	8	6.4	0	0	0	0	0	0	0	0	0	0	4	0	1	0	0	0	0	0	5	1.8
19:00	1	0	2	0	0	0	0	0	3	2.2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0.2
19:15	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19:30	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0.2	0	0	1	0	0	0	0	0	1	1
19:45	0	0	2	0	1	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	1	0	6	0	1	0	0	0	8	7.2	1	0	0	0	0	0	0	0	1	0.2	1	0	1	0	0	0	0	0	2	1.2
20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TIME	C => A P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU	C => B P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU	C => C P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU
06:00	0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:15	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:30	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	7	0	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	1	0	1	0	1	0	0	0	3	2.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	0	0	4	0	1	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	1	0	7	0	2	0	0	0	10	9.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	1	0	2	0	0	0	0	0	3	2.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	4	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30	0	1	3	0	2	1	0	0	7	6.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45	0	0	2	0	0	0	0	0	2	2	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
H/TOT	1	1	11	0	2	1	0	0	16	15.1	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
09:00	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15	0	0	5	0	1	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45	0	0	6	0	1	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	14	0	2	0	0	0	16	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15	2	0	2	0	0	0	0	0	4	2.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30	0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45	0	0	4	0	1	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	2	0	11	0	1	0	0	0	14	12.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	0	5	0	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15	0	0	5	0	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	8	0	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	0	3	0	0	0	0	0	3	3	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	21	0	0	0	0	0	21	21	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
12:00	0	0	4	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15	0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	4	0	1	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45	0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	14	0	1	0	0	0	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:00	0	0	4	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	0	5	0	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30	2	0	2	0	0	1	0	0	5	3.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	4	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	2	0	15	0	0	1	0	0	18	16.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:00	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:15	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:30	0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:45	0	0	3	0	0	1	0	0	4	4.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	9	0	0	1	0	0	10	10.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00	0	0	4	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15	0	0	5	0	1	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30	1	0	0	0	0	0	0	0	1	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:45	0	0	5	0	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	1	0	14	0	1	0	0	0	16	15.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	4	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	10	0	0	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	1	0	7	0	1	1	0	0	10	9.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	5	0	1	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	1	0	1	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	5	0	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	1	0	18	0	3	1	0	0	23	22.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00	0	0	7	0	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15	0	0	4	0	1	0	0	0	5	5	2	0	1	0	0	0	0	0	3	1.4	0	0	0	0	0	0	0	0	0	0
18:30	1	0	8	0	0	0	0	0	9	8.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:45	3	0	6	0	0	0	0	0	9	6.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	4	0	25	0	1	0	0	0	30	26.8	2	0	1	0	0	0	0	0	3	1.4	0	0	0	0	0	0	0	0	0	0
19:00	3	0	4	0	1	0	0	0	8	5.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19:15	0	0	2	0	0	0	0	0	2	2	4	0	1	0	0	0	0	0	5	1.8	0	0	0	0	0	0	0	0	0	0
19:30	0	0	4	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19:45	0	0	13	0	2	0	0	0	15	15	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
H/TOT	3	0	23	0	3	0	0	0	29	26.6	4	0	1	0	1	0	0	0	6	2.8	0	0	0	0	0	0	0	0	0	0
20:00	0	0	6	0	0	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

20:15	0	0	0	0	0	0	0	0	0	0	1	0	2	0	1	0	0	0	4	3.2	1	0	3	0	0	0	0	0	4	3.2
20:30	0	0	1	0	0	0	0	0	1	1	0	0	3	0	0	0	0	0	3	3	0	0	2	0	0	0	0	0	2	2
20:45	1	0	0	0	0	0	0	0	1	0.2	0	0	1	0	0	0	0	0	1	1	3	0	1	0	0	0	0	0	4	1.6
H/TOT	1	0	1	0	0	0	0	0	2	1.2	1	0	9	0	1	0	0	0	11	10.2	4	0	12	0	1	0	0	0	17	13.8
21:00	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	3	0	0	0	0	0	3	3
21:15	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2	2	0	2	0	0	0	0	0	4	2.4
21:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2
21:45	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0.2	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	0	0	0	0	0	0	0	0	1	0	3	0	0	0	0	0	4	3.2	2	0	8	0	0	0	0	0	10	8.4
16 TOT	2	0	21	0	5	0	0	0	28	26.4	17	1	83	1	10	8	0	0	120	110	28	1	212	0	16	2	0	0	259	237

20:15	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
20:30	0	0	3	0	0	0	0	0	3	3	1	0	0	0	0	0	0	0	1	0.2	0	0	0	0	0	0	0	0	0	0
20:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	3	0	0	0	0	0	3	3	1	0	1	0	0	0	0	0	2	1.2	0	0	0	0	0	0	0	0	0	0
21:00	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21:15	2	0	0	0	0	0	0	0	2	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	2	0	1	0	0	0	0	0	3	1.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 TOT	19	1	73	1	12	5	0	0	111	97.7	6	0	2	0	0	0	0	0	8	3.2	10	0	3	0	1	2	0	0	16	9

20:15	1	0	1	0	1	0	0	0	3	2.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20:30	1	0	0	0	0	0	0	0	1	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20:45	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0.2	0	0	0	0	0	0	0	0	0	0
H/TOT	2	0	7	0	1	0	0	0	10	8.4	1	0	0	0	0	0	0	0	1	0.2	0	0	0	0	0	0	0	0	0	0
21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21:15	2	0	0	0	0	0	0	0	2	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21:30	0	0	5	0	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21:45	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	2	0	6	0	0	0	0	0	8	6.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 TOT	19	1	212	0	17	4	0	0	253	239	7	0	3	0	2	0	0	0	12	6.4	0	0	0	0	0	0	0	0	0	0

Appendix B TRICS Data

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
VEHICLES
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	117	108	0.065	117	108	0.284	117	108	0.349
08:00 - 09:00	117	108	0.131	**117**	**108**	**0.375**	117	108	0.506
09:00 - 10:00	117	108	0.148	117	108	0.179	117	108	0.327
10:00 - 11:00	117	108	0.121	117	108	0.145	117	108	0.266
11:00 - 12:00	117	108	0.127	117	108	0.138	117	108	0.265
12:00 - 13:00	117	108	0.156	117	108	0.151	117	108	0.307
13:00 - 14:00	117	108	0.158	117	108	0.155	117	108	0.313
14:00 - 15:00	117	108	0.169	117	108	0.180	117	108	0.349
15:00 - 16:00	117	108	0.241	117	108	0.172	117	108	0.413
16:00 - 17:00	117	108	0.269	117	108	0.162	117	108	0.431
17:00 - 18:00	**117**	**108**	**0.346**	117	108	0.168	**117**	**108**	**0.514**
18:00 - 19:00	117	108	0.291	117	108	0.172	117	108	0.463
19:00 - 20:00	4	44	0.147	4	44	0.090	4	44	0.237
20:00 - 21:00	4	44	0.141	4	44	0.113	4	44	0.254
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			2.510			2.484			4.994

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

Parameter summary

Trip rate parameter range selected:	6 - 1817 (units:)
Survey date date range:	01/01/12 - 19/11/19
Number of weekdays (Monday-Friday):	121
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	7
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

Appendix C Junctions 9 Results

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.0.6896

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

Filename: 192234 Junctions 9 Site 1 July 2020.j9
Path: \\w2k8-dub-dc1\users\CAD\DWGS\192\201-250\192234\OfficeDocs\Reports\TTA\Traffic calcs
Report generation date: 23/07/2020 14:20:42

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
2020 Existing +10%								
Stream B-AC	0.2	9.73	0.17	A	0.2	9.94	0.17	A
Stream C-AB	0.0	5.59	0.03	A	0.0	5.36	0.03	A
2023 Opening Year Without Development								
Stream B-AC	0.2	9.91	0.18	A	0.2	10.13	0.18	B
Stream C-AB	0.0	5.57	0.03	A	0.0	5.33	0.03	A
2028 Design Year Without Development								
Stream B-AC	0.2	10.21	0.19	B	0.2	10.49	0.20	B
Stream C-AB	0.0	5.51	0.03	A	0.0	5.25	0.03	A
2038 Design Year Without Development								
Stream B-AC	0.3	10.52	0.21	B	0.3	10.82	0.21	B
Stream C-AB	0.0	5.46	0.03	A	0.0	5.19	0.03	A
2023 Opening Year With Development								
Stream B-AC	0.3	10.58	0.23	B	0.3	10.60	0.21	B
Stream C-AB	0.0	5.59	0.03	A	0.0	5.37	0.03	A
2028 Design Year With Development								
Stream B-AC	0.3	10.92	0.24	B	0.3	10.99	0.23	B
Stream C-AB	0.0	5.53	0.03	A	0.0	5.29	0.04	A
2038 Design Year With Development								
Stream B-AC	0.4	11.28	0.26	B	0.3	11.35	0.24	B
Stream C-AB	0.0	5.48	0.04	A	0.1	5.23	0.04	A

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

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

File summary

File Description

Title	
Location	
Site number	
Date	22/07/2020
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	MPPNET\JTiernan
Description	

Units

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

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75				0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2020 Existing +10%	AM	ONE HOUR	08:00	09:30	15	✓
D2	2020 Existing +10%	PM	ONE HOUR	17:00	18:30	15	✓
D3	2023 Opening Year Without Development	AM	ONE HOUR	08:00	09:30	15	✓
D4	2023 Opening Year Without Development	PM	ONE HOUR	17:00	18:30	15	✓
D5	2028 Design Year Without Development	AM	ONE HOUR	08:00	09:30	15	✓
D6	2028 Design Year Without Development	PM	ONE HOUR	17:00	18:30	15	✓
D7	2038 Design Year Without Development	AM	ONE HOUR	08:00	09:30	15	✓
D8	2038 Design Year Without Development	PM	ONE HOUR	17:00	18:30	15	✓
D9	2023 Opening Year With Development	AM	ONE HOUR	08:00	09:30	15	✓
D10	2023 Opening Year With Development	PM	ONE HOUR	17:00	18:30	15	✓
D11	2028 Design Year With Development	AM	ONE HOUR	08:00	09:30	15	✓
D12	2028 Design Year With Development	PM	ONE HOUR	17:00	18:30	15	✓
D13	2038 Design Year With Development	AM	ONE HOUR	08:00	09:30	15	✓
D14	2038 Design Year With Development	PM	ONE HOUR	17:00	18:30	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2020 Existing +10%, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		2.00	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	R722 South		Major
B	Ashford Downs		Minor
C	R722 North		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	6.00			0.0	✓	0.00

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

Minor Arm Geometry

Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
B	One lane	3.00	0	0

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	478	0.087	0.220	0.138	0.314
1	B-C	624	0.096	0.242	-	-
1	C-B	574	0.222	0.222	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.
Streams may be combined, in which case capacity will be adjusted.
Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2020 Existing +10%	AM	ONE HOUR	08:00	09:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	105	100.000
B		ONE HOUR	✓	68	100.000
C		ONE HOUR	✓	200	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	39	66
	B	58	0	10
	C	189	11	0

Vehicle Mix

Heavy Vehicle Percentages

		To		

		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.17	9.73	0.2	A	62	94
C-AB	0.03	5.59	0.0	A	14	21
C-A					170	255
A-B					36	54
A-C					61	91

2020 Existing +10%, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.61	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2020 Existing +10%	PM	ONE HOUR	17:00	18:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	138	100.000
B		ONE HOUR	✓	67	100.000
C		ONE HOUR	✓	265	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	81	57
	B	56	0	11
	C	254	11	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.17	9.94	0.2	A	61	92
C-AB	0.03	5.36	0.0	A	15	23
C-A					228	342
A-B					74	111
A-C					52	78

2023 Opening Year Without Development, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		2.04	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2023 Opening Year Without Development	AM	ONE HOUR	08:00	09:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	109	100.000
B		ONE HOUR	✓	71	100.000
C		ONE HOUR	✓	210	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	40	69
	B	61	0	10
	C	198	12	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.18	9.91	0.2	A	65	98
C-AB	0.03	5.57	0.0	A	15	23
C-A					177	266
A-B					37	55
A-C					63	95

2023 Opening Year Without Development, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.66	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2023 Opening Year Without Development	PM	ONE HOUR	17:00	18:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	145	100.000
B		ONE HOUR	✓	71	100.000
C		ONE HOUR	✓	278	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	85	60
	B	59	0	12
	C	266	12	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.18	10.13	0.2	B	65	98
C-AB	0.03	5.33	0.0	A	17	25
C-A					238	357
A-B					78	117
A-C					55	83

2028 Design Year Without Development, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		2.08	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D5	2028 Design Year Without Development	AM	ONE HOUR	08:00	09:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	119	100.000
B		ONE HOUR	✓	77	100.000
C		ONE HOUR	✓	226	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	44	75
	B	66	0	11
	C	214	12	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.19	10.21	0.2	B	71	106
C-AB	0.03	5.51	0.0	A	16	23
C-A					192	288
A-B					40	61
A-C					69	103

2028 Design Year Without Development, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.68	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D6	2028 Design Year Without Development	PM	ONE HOUR	17:00	18:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	157	100.000
B		ONE HOUR	✓	76	100.000
C		ONE HOUR	✓	300	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	92	65
	B	64	0	12
	C	288	12	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.20	10.49	0.2	B	70	105
C-AB	0.03	5.25	0.0	A	18	26
C-A					258	387
A-B					84	127
A-C					60	89

2038 Design Year Without Development, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		2.16	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D7	2038 Design Year Without Development	AM	ONE HOUR	08:00	09:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	127	100.000
B		ONE HOUR	✓	83	100.000
C		ONE HOUR	✓	243	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	47	80
	B	71	0	12
	C	230	13	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.21	10.52	0.3	B	76	114
C-AB	0.03	5.46	0.0	A	17	26
C-A					206	308
A-B					43	65
A-C					73	110

2038 Design Year Without Development, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.73	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D8	2038 Design Year Without Development	PM	ONE HOUR	17:00	18:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	169	100.000
B		ONE HOUR	✓	81	100.000
C		ONE HOUR	✓	322	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	99	70
	B	68	0	13
	C	309	13	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.21	10.82	0.3	B	74	111
C-AB	0.03	5.19	0.0	A	20	30
C-A					276	414
A-B					91	136
A-C					64	96

2023 Opening Year With Development , AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		2.56	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D9	2023 Opening Year With Development	AM	ONE HOUR	08:00	09:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	115	100.000
B		ONE HOUR	✓	91	100.000
C		ONE HOUR	✓	212	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	46	69
	B	78	0	13
	C	198	14	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.23	10.58	0.3	B	84	125
C-AB	0.03	5.59	0.0	A	18	27
C-A					177	265
A-B					42	63
A-C					63	95

2023 Opening Year With Development, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.89	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D10	2023 Opening Year With Development	PM	ONE HOUR	17:00	18:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	164	100.000
B		ONE HOUR	✓	83	100.000
C		ONE HOUR	✓	280	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	104	60
	B	69	0	14
	C	266	14	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.21	10.60	0.3	B	76	114
C-AB	0.03	5.37	0.0	A	20	30
C-A					237	356
A-B					95	143
A-C					55	83

2028 Design Year With Development , AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		2.60	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D11	2028 Design Year With Development	AM	ONE HOUR	08:00	09:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	125	100.000
B		ONE HOUR	✓	97	100.000
C		ONE HOUR	✓	228	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	50	75
	B	83	0	14
	C	214	14	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.24	10.92	0.3	B	89	134
C-AB	0.03	5.53	0.0	A	18	27
C-A					191	287
A-B					46	69
A-C					69	103

2028 Design Year With Development , PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.92	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D12	2028 Design Year With Development	PM	ONE HOUR	17:00	18:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	176	100.000
B		ONE HOUR	✓	88	100.000
C		ONE HOUR	✓	302	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	111	65
	B	74	0	14
	C	288	14	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.23	10.99	0.3	B	81	121
C-AB	0.04	5.29	0.0	A	21	31
C-A					257	385
A-B					102	153
A-C					60	89

2038 Design Year With Development, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		2.66	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D13	2038 Design Year With Development	AM	ONE HOUR	08:00	09:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	133	100.000
B		ONE HOUR	✓	103	100.000
C		ONE HOUR	✓	245	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	53	80
	B	88	0	15
	C	230	15	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.26	11.28	0.4	B	95	142
C-AB	0.04	5.48	0.0	A	20	30
C-A					205	307
A-B					49	73
A-C					73	110

2038 Design Year With Development, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.96	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D14	2038 Design Year With Development	PM	ONE HOUR	17:00	18:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	188	100.000
B		ONE HOUR	✓	93	100.000
C		ONE HOUR	✓	324	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	118	70
	B	78	0	15
	C	309	15	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.24	11.35	0.3	B	85	128
C-AB	0.04	5.23	0.1	A	23	34
C-A					275	412
A-B					108	162
A-C					64	96

Junctions 9

PICADY 9 - Priority Intersection Module

Filename: 192234 Junctions 9 Site 2 July 2020.j9
Path: \\w2k8-dub-dc1\users\CAD\DWGS\192\201-250\192234\OfficeDocs\Reports\TTA\Traffic calcs
Report generation date: 23/07/2020 14:24:45

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	2020 Existing +10%							
Stream B-AC	0.2	8.81	0.15	A	0.1	8.21	0.11	A
Stream C-AB	0.0	6.33	0.02	A	0.0	6.39	0.04	A
	2023 Opening Year Without Development							
Stream B-AC	0.2	8.89	0.16	A	0.1	8.28	0.11	A
Stream C-AB	0.0	6.34	0.03	A	0.0	6.39	0.04	A
	2028 Design Year Without Development							
Stream B-AC	0.2	9.09	0.17	A	0.1	8.40	0.12	A
Stream C-AB	0.0	6.34	0.03	A	0.1	6.41	0.04	A
	2038 Design Year Without Development							
Stream B-AC	0.2	9.26	0.18	A	0.1	8.57	0.13	A
Stream C-AB	0.0	6.35	0.03	A	0.1	6.41	0.04	A
	2023 Opening Year With Development							
Stream B-AC	0.3	9.47	0.21	A	0.1	8.46	0.12	A
Stream C-AB	0.0	6.38	0.03	A	0.1	6.49	0.05	A
	2028 Design Year With Development							
Stream B-AC	0.3	9.70	0.22	A	0.2	8.59	0.13	A
Stream C-AB	0.0	6.38	0.03	A	0.1	6.51	0.05	A
	2038 Design Year With Development							
Stream B-AC	0.3	9.90	0.24	A	0.2	8.77	0.14	A
Stream C-AB	0.0	6.39	0.03	A	0.1	6.52	0.06	A

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

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

File summary

File Description

Title	
Location	
Site number	
Date	22/07/2020
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	MPPNET\JTiernan
Description	

Units

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

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75				0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2020 Existing +10%	AM	ONE HOUR	08:00	09:30	15	✓
D2	2020 Existing +10%	PM	ONE HOUR	17:00	18:30	15	✓
D3	2023 Opening Year Without Development	AM	ONE HOUR	08:00	09:30	15	✓
D4	2023 Opening Year Without Development	PM	ONE HOUR	17:00	18:30	15	✓
D5	2028 Design Year Without Development	AM	ONE HOUR	08:00	09:30	15	✓
D6	2028 Design Year Without Development	PM	ONE HOUR	17:00	18:30	15	✓
D7	2038 Design Year Without Development	AM	ONE HOUR	08:00	09:30	15	✓
D8	2038 Design Year Without Development	PM	ONE HOUR	17:00	18:30	15	✓
D9	2023 Opening Year With Development	AM	ONE HOUR	08:00	09:30	15	✓
D10	2023 Opening Year With Development	PM	ONE HOUR	17:00	18:30	15	✓
D11	2028 Design Year With Development	AM	ONE HOUR	08:00	09:30	15	✓
D12	2028 Design Year With Development	PM	ONE HOUR	17:00	18:30	15	✓
D13	2038 Design Year With Development	AM	ONE HOUR	08:00	09:30	15	✓
D14	2038 Design Year With Development	PM	ONE HOUR	17:00	18:30	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2020 Existing +10%, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		3.56	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	Chestnut Glen North		Major
B	Ashford Downs		Minor
C	Chestnut Glen South		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	6.00			0.0	✓	0.00

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

Minor Arm Geometry

Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
B	One lane	3.00	0	0

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	478	0.087	0.220	0.138	0.314
1	B-C	624	0.096	0.242	-	-
1	C-B	574	0.222	0.222	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.
Streams may be combined, in which case capacity will be adjusted.
Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2020 Existing +10%	AM	ONE HOUR	08:00	09:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	73	100.000
B		ONE HOUR	✓	66	100.000
C		ONE HOUR	✓	47	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	33	40
	B	52	0	14
	C	35	12	0

Vehicle Mix

Heavy Vehicle Percentages

	To

		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.15	8.81	0.2	A	61	91
C-AB	0.02	6.33	0.0	A	12	18
C-A					31	47
A-B					30	45
A-C					37	55

2020 Existing +10%, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		2.12	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2020 Existing +10%	PM	ONE HOUR	17:00	18:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	123	100.000
B		ONE HOUR	✓	47	100.000
C		ONE HOUR	✓	72	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	48	75
	B	29	0	18
	C	54	18	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.11	8.21	0.1	A	43	65
C-AB	0.04	6.39	0.0	A	18	27
C-A					48	72
A-B					44	66
A-C					69	103

2023 Opening Year Without Development, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		3.59	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2023 Opening Year Without Development	AM	ONE HOUR	08:00	09:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	76	100.000
B		ONE HOUR	✓	69	100.000
C		ONE HOUR	✓	50	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	35	41
	B	54	0	15
	C	37	13	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.16	8.89	0.2	A	63	95
C-AB	0.03	6.34	0.0	A	13	19
C-A					33	50
A-B					32	48
A-C					38	56

2023 Opening Year Without Development, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		2.09	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2023 Opening Year Without Development	PM	ONE HOUR	17:00	18:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	129	100.000
B		ONE HOUR	✓	48	100.000
C		ONE HOUR	✓	74	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	51	78
	B	30	0	18
	C	56	18	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.11	8.28	0.1	A	44	66
C-AB	0.04	6.39	0.0	A	18	27
C-A					50	75
A-B					47	70
A-C					72	107

2028 Design Year Without Development, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		3.68	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D5	2028 Design Year Without Development	AM	ONE HOUR	08:00	09:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	82	100.000
B		ONE HOUR	✓	75	100.000
C		ONE HOUR	✓	54	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	37	45
	B	59	0	16
	C	40	14	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.17	9.09	0.2	A	69	103
C-AB	0.03	6.34	0.0	A	14	21
C-A					36	54
A-B					34	51
A-C					41	62

2028 Design Year Without Development, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		2.12	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D6	2028 Design Year Without Development	PM	ONE HOUR	17:00	18:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	140	100.000
B		ONE HOUR	✓	52	100.000
C		ONE HOUR	✓	81	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	55	85
	B	32	0	20
	C	61	20	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.12	8.40	0.1	A	48	72
C-AB	0.04	6.41	0.1	A	20	31
C-A					54	81
A-B					50	76
A-C					78	117

2038 Design Year Without Development, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		3.73	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D7	2038 Design Year Without Development	AM	ONE HOUR	08:00	09:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	88	100.000
B		ONE HOUR	✓	80	100.000
C		ONE HOUR	✓	58	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	40	48
	B	63	0	17
	C	43	15	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.18	9.26	0.2	A	73	110
C-AB	0.03	6.35	0.0	A	15	22
C-A					38	58
A-B					37	55
A-C					44	66

2038 Design Year Without Development, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		2.15	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D8	2038 Design Year Without Development	PM	ONE HOUR	17:00	18:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	150	100.000
B		ONE HOUR	✓	56	100.000
C		ONE HOUR	✓	87	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	59	91
	B	35	0	21
	C	66	21	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.13	8.57	0.1	A	51	77
C-AB	0.04	6.41	0.1	A	22	32
C-A					58	87
A-B					54	81
A-C					84	125

2023 Opening Year With Development , AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		4.30	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D9	2023 Opening Year With Development	AM	ONE HOUR	08:00	09:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	81	100.000
B		ONE HOUR	✓	91	100.000
C		ONE HOUR	✓	52	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	40	41
	B	71	0	20
	C	37	15	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.21	9.47	0.3	A	84	125
C-AB	0.03	6.38	0.0	A	15	22
C-A					33	50
A-B					37	55
A-C					38	56

2023 Opening Year With Development, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		2.29	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D10	2023 Opening Year With Development	PM	ONE HOUR	17:00	18:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	141	100.000
B		ONE HOUR	✓	55	100.000
C		ONE HOUR	✓	79	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	63	78
	B	34	0	21
	C	56	23	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.12	8.46	0.1	A	50	76
C-AB	0.05	6.49	0.1	A	23	35
C-A					49	74
A-B					58	87
A-C					72	107

2028 Design Year With Development , AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		4.38	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D11	2028 Design Year With Development	AM	ONE HOUR	08:00	09:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	87	100.000
B		ONE HOUR	✓	97	100.000
C		ONE HOUR	✓	56	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	42	45
	B	76	0	21
	C	40	16	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.22	9.70	0.3	A	89	134
C-AB	0.03	6.38	0.0	A	16	24
C-A					36	54
A-B					39	58
A-C					41	62

2028 Design Year With Development , PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		2.31	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D12	2028 Design Year With Development	PM	ONE HOUR	17:00	18:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	152	100.000
B		ONE HOUR	✓	59	100.000
C		ONE HOUR	✓	86	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	67	85
	B	36	0	23
	C	61	25	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.13	8.59	0.2	A	54	81
C-AB	0.05	6.51	0.1	A	25	38
C-A					53	80
A-B					61	92
A-C					78	117

2038 Design Year With Development, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		4.42	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D13	2038 Design Year With Development	AM	ONE HOUR	08:00	09:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	93	100.000
B		ONE HOUR	✓	102	100.000
C		ONE HOUR	✓	60	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	45	48
	B	80	0	22
	C	43	17	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.24	9.90	0.3	A	94	140
C-AB	0.03	6.39	0.0	A	17	25
C-A					38	57
A-B					41	62
A-C					44	66

2038 Design Year With Development, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		2.34	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D14	2038 Design Year With Development	PM	ONE HOUR	17:00	18:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	162	100.000
B		ONE HOUR	✓	63	100.000
C		ONE HOUR	✓	92	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	71	91
	B	39	0	24
	C	66	26	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.14	8.77	0.2	A	58	87
C-AB	0.06	6.52	0.1	A	27	40
C-A					58	87
A-B					65	98
A-C					84	125

Junctions 9
PICADY 9 - Priority Intersection Module
Version: 9.5.0.6896 © Copyright TRL Limited, 2018
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Filename: 192234 Junctions 9 Site 3 July 2020.j9
Path: \\w2k8-dub-dc1\users\CAD\DWGS\192\201-250\192234\OfficeDocs\Reports\TTA\Traffic calcs
Report generation date: 23/07/2020 14:34:26

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	2020 Existing +10%							
Stream B-AC	0.1	7.73	0.12	A	0.1	8.19	0.12	A
Stream C-AB	0.0	6.37	0.04	A	0.1	6.75	0.07	A
	2023 Opening Year Without Development							
Stream B-AC	0.1	7.83	0.12	A	0.1	8.24	0.12	A
Stream C-AB	0.0	6.37	0.04	A	0.1	6.79	0.08	A
	2028 Design Year Without Development							
Stream B-AC	0.2	7.93	0.13	A	0.1	8.40	0.13	A
Stream C-AB	0.1	6.38	0.04	A	0.1	6.84	0.08	A
	2038 Design Year Without Development							
Stream B-AC	0.2	8.05	0.14	A	0.2	8.55	0.14	A
Stream C-AB	0.1	6.38	0.05	A	0.1	6.88	0.09	A
	2023 Opening Year With Development							
Stream B-AC	0.3	8.76	0.21	A	0.2	8.81	0.16	A
Stream C-AB	0.1	6.49	0.05	A	0.1	7.12	0.11	A
	2028 Design Year With Development							
Stream B-AC	0.3	8.90	0.22	A	0.2	8.98	0.17	A
Stream C-AB	0.1	6.49	0.06	A	0.1	7.18	0.12	A
	2038 Design Year With Development							
Stream B-AC	0.3	9.04	0.23	A	0.2	9.17	0.19	A
Stream C-AB	0.1	6.51	0.06	A	0.2	7.23	0.13	A

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

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

File summary

File Description

Title	
Location	
Site number	
Date	22/07/2020
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	MPPNET\JTiernan
Description	

Units

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

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75				0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2020 Existing +10%	AM	ONE HOUR	08:00	09:30	15	✓
D2	2020 Existing +10%	PM	ONE HOUR	17:00	18:30	15	✓
D3	2023 Opening Year Without Development	AM	ONE HOUR	08:00	09:30	15	✓
D4	2023 Opening Year Without Development	PM	ONE HOUR	17:00	18:30	15	✓
D5	2028 Design Year Without Development	AM	ONE HOUR	08:00	09:30	15	✓
D6	2028 Design Year Without Development	PM	ONE HOUR	17:00	18:30	15	✓
D7	2038 Design Year Without Development	AM	ONE HOUR	08:00	09:30	15	✓
D8	2038 Design Year Without Development	PM	ONE HOUR	17:00	18:30	15	✓
D9	2023 Opening Year With Development	AM	ONE HOUR	08:00	09:30	15	✓
D10	2023 Opening Year With Development	PM	ONE HOUR	17:00	18:30	15	✓
D11	2028 Design Year With Development	AM	ONE HOUR	08:00	09:30	15	✓
D12	2028 Design Year With Development	PM	ONE HOUR	17:00	18:30	15	✓
D13	2038 Design Year With Development	AM	ONE HOUR	08:00	09:30	15	✓
D14	2038 Design Year With Development	PM	ONE HOUR	17:00	18:30	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2020 Existing +10%, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		3.30	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	Ashford Downs East		Major
B	Ashleigh		Minor
C	Ashford Downs West		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	6.00			0.0	✓	0.00

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

Minor Arm Geometry

Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
B	One lane	3.00	0	0

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	478	0.087	0.220	0.138	0.314
1	B-C	624	0.096	0.242	-	-
1	C-B	574	0.222	0.222	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.
Streams may be combined, in which case capacity will be adjusted.
Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2020 Existing +10%	AM	ONE HOUR	08:00	09:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	58	100.000
B		ONE HOUR	✓	56	100.000
C		ONE HOUR	✓	56	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	22	36
	B	26	0	30
	C	37	19	0

Vehicle Mix

Heavy Vehicle Percentages

		To		

		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.12	7.73	0.1	A	51	77
C-AB	0.04	6.37	0.0	A	19	28
C-A					33	49
A-B					20	30
A-C					33	50

2020 Existing +10%, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		3.35	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2020 Existing +10%	PM	ONE HOUR	17:00	18:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	86	100.000
B		ONE HOUR	✓	52	100.000
C		ONE HOUR	✓	65	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	42	44
	B	32	0	20
	C	29	36	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.12	8.19	0.1	A	48	72
C-AB	0.07	6.75	0.1	A	35	52
C-A					25	37
A-B					39	58
A-C					40	61

2023 Opening Year Without Development, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		3.34	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2023 Opening Year Without Development	AM	ONE HOUR	08:00	09:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	61	100.000
B		ONE HOUR	✓	59	100.000
C		ONE HOUR	✓	59	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	23	38
	B	28	0	31
	C	39	20	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.12	7.83	0.1	A	54	81
C-AB	0.04	6.37	0.0	A	20	29
C-A					35	52
A-B					21	32
A-C					35	52

2023 Opening Year Without Development, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		3.38	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2023 Opening Year Without Development	PM	ONE HOUR	17:00	18:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	90	100.000
B		ONE HOUR	✓	54	100.000
C		ONE HOUR	✓	68	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	44	46
	B	33	0	21
	C	30	38	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.12	8.24	0.1	A	50	74
C-AB	0.08	6.79	0.1	A	37	55
C-A					26	39
A-B					40	61
A-C					42	63

2028 Design Year Without Development, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		3.38	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D5	2028 Design Year Without Development	AM	ONE HOUR	08:00	09:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	66	100.000
B		ONE HOUR	✓	64	100.000
C		ONE HOUR	✓	63	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	25	41
	B	30	0	34
	C	42	21	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.13	7.93	0.2	A	59	88
C-AB	0.04	6.38	0.1	A	21	31
C-A					37	56
A-B					23	34
A-C					38	56

2028 Design Year Without Development, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		3.43	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D6	2028 Design Year Without Development	PM	ONE HOUR	17:00	18:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	97	100.000
B		ONE HOUR	✓	58	100.000
C		ONE HOUR	✓	73	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	47	50
	B	36	0	22
	C	32	41	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.13	8.40	0.1	A	53	80
C-AB	0.08	6.84	0.1	A	40	60
C-A					27	41
A-B					43	65
A-C					46	69

2038 Design Year Without Development, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		3.39	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D7	2038 Design Year Without Development	AM	ONE HOUR	08:00	09:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	71	100.000
B		ONE HOUR	✓	68	100.000
C		ONE HOUR	✓	69	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	27	44
	B	32	0	36
	C	46	23	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.14	8.05	0.2	A	62	94
C-AB	0.05	6.38	0.1	A	23	34
C-A					41	61
A-B					25	37
A-C					40	61

2038 Design Year Without Development, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		3.48	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D8	2038 Design Year Without Development	PM	ONE HOUR	17:00	18:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	105	100.000
B		ONE HOUR	✓	63	100.000
C		ONE HOUR	✓	79	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	51	54
	B	39	0	24
	C	35	44	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.14	8.55	0.2	A	58	87
C-AB	0.09	6.88	0.1	A	43	64
C-A					30	44
A-B					47	70
A-C					50	74

2023 Opening Year With Development , AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		4.54	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D9	2023 Opening Year With Development	AM	ONE HOUR	08:00	09:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	69	100.000
B		ONE HOUR	✓	101	100.000
C		ONE HOUR	✓	66	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	31	38
	B	48	0	53
	C	39	27	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.21	8.76	0.3	A	93	139
C-AB	0.05	6.49	0.1	A	26	40
C-A					34	51
A-B					28	43
A-C					35	52

2023 Opening Year With Development, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		3.92	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D10	2023 Opening Year With Development	PM	ONE HOUR	17:00	18:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	111	100.000
B		ONE HOUR	✓	73	100.000
C		ONE HOUR	✓	85	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	65	46
	B	45	0	28
	C	30	55	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.16	8.81	0.2	A	67	100
C-AB	0.11	7.12	0.1	A	53	80
C-A					25	37
A-B					60	89
A-C					42	63

2028 Design Year With Development , AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		4.55	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D11	2028 Design Year With Development	AM	ONE HOUR	08:00	09:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	74	100.000
B		ONE HOUR	✓	106	100.000
C		ONE HOUR	✓	70	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	33	41
	B	50	0	56
	C	42	28	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.22	8.90	0.3	A	97	146
C-AB	0.06	6.49	0.1	A	28	41
C-A					37	55
A-B					30	45
A-C					38	56

2028 Design Year With Development , PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		3.97	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D12	2028 Design Year With Development	PM	ONE HOUR	17:00	18:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	118	100.000
B		ONE HOUR	✓	77	100.000
C		ONE HOUR	✓	90	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	68	50
	B	48	0	29
	C	32	58	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.17	8.98	0.2	A	71	106
C-AB	0.12	7.18	0.1	A	56	84
C-A					26	40
A-B					62	94
A-C					46	69

2038 Design Year With Development, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		4.55	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D13	2038 Design Year With Development	AM	ONE HOUR	08:00	09:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	79	100.000
B		ONE HOUR	✓	110	100.000
C		ONE HOUR	✓	76	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	35	44
	B	52	0	58
	C	46	30	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.23	9.04	0.3	A	101	151
C-AB	0.06	6.51	0.1	A	30	45
C-A					40	60
A-B					32	48
A-C					40	61

2038 Design Year With Development, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		4.01	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D14	2038 Design Year With Development	PM	ONE HOUR	17:00	18:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	126	100.000
B		ONE HOUR	✓	82	100.000
C		ONE HOUR	✓	96	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	72	54
	B	51	0	31
	C	35	61	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.19	9.17	0.2	A	75	113
C-AB	0.13	7.23	0.2	A	59	89
C-A					29	43
A-B					66	99
A-C					50	74

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.0.6896

For sales and distribution information, program advice and maintenance, contact TRL:
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Filename: 192234 Junctions 9 Site 4 July 2020.j9
Path: \\w2k8-dub-dc1\users\CAD\DWGS\192\201-250\192234\OfficeDocs\Reports\TTA\Traffic calcs
Report generation date: 23/07/2020 14:43:54

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	2020 Existing +10%							
Stream B-AC	0.0	7.82	0.03	A	0.0	7.67	0.02	A
Stream C-AB	0.0	0.00	0.00	A	0.0	6.21	0.01	A
	2023 Opening Year Without Development							
Stream B-AC	0.0	7.84	0.03	A	0.0	7.71	0.02	A
Stream C-AB	0.0	0.00	0.00	A	0.0	6.20	0.01	A
	2028 Design Year Without Development							
Stream B-AC	0.0	7.87	0.03	A	0.0	7.77	0.02	A
Stream C-AB	0.0	0.00	0.00	A	0.0	6.20	0.01	A
	2038 Design Year Without Development							
Stream B-AC	0.0	7.89	0.03	A	0.0	7.79	0.02	A
Stream C-AB	0.0	0.00	0.00	A	0.0	6.19	0.01	A
	2023 Opening Year With Development							
Stream B-AC	0.1	8.75	0.13	A	0.1	8.30	0.07	A
Stream C-AB	0.0	0.00	0.00	A	0.0	6.27	0.01	A
	2028 Design Year With Development							
Stream B-AC	0.1	8.78	0.13	A	0.1	8.36	0.07	A
Stream C-AB	0.0	0.00	0.00	A	0.0	6.27	0.01	A
	2038 Design Year With Development							
Stream B-AC	0.2	8.82	0.13	A	0.1	8.37	0.07	A
Stream C-AB	0.0	0.00	0.00	A	0.0	6.26	0.01	A

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

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

File summary

File Description

Title	
Location	
Site number	
Date	22/07/2020
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	MPPNET\JTiernan
Description	

Units

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

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75				0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2020 Existing +10%	AM	ONE HOUR	08:00	09:30	15	✓
D2	2020 Existing +10%	PM	ONE HOUR	17:00	18:30	15	✓
D3	2023 Opening Year Without Development	AM	ONE HOUR	08:00	09:30	15	✓
D4	2023 Opening Year Without Development	PM	ONE HOUR	17:00	18:30	15	✓
D5	2028 Design Year Without Development	AM	ONE HOUR	08:00	09:30	15	✓
D6	2028 Design Year Without Development	PM	ONE HOUR	17:00	18:30	15	✓
D7	2038 Design Year Without Development	AM	ONE HOUR	08:00	09:30	15	✓
D8	2038 Design Year Without Development	PM	ONE HOUR	17:00	18:30	15	✓
D9	2023 Opening Year With Development	AM	ONE HOUR	08:00	09:30	15	✓
D10	2023 Opening Year With Development	PM	ONE HOUR	17:00	18:30	15	✓
D11	2028 Design Year With Development	AM	ONE HOUR	08:00	09:30	15	✓
D12	2028 Design Year With Development	PM	ONE HOUR	17:00	18:30	15	✓
D13	2038 Design Year With Development	AM	ONE HOUR	08:00	09:30	15	✓
D14	2038 Design Year With Development	PM	ONE HOUR	17:00	18:30	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2020 Existing +10%, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		2.46	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	Ashford Downs East		Major
B	Ashleigh		Minor
C	Ashford Downs West		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	6.00			0.0	✓	0.00

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

Minor Arm Geometry

Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
B	One lane	3.00	0	0

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	478	0.087	0.220	0.138	0.314
1	B-C	624	0.096	0.242	-	-
1	C-B	574	0.222	0.222	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.
Streams may be combined, in which case capacity will be adjusted.
Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2020 Existing +10%	AM	ONE HOUR	08:00	09:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	10	100.000
B		ONE HOUR	✓	12	100.000
C		ONE HOUR	✓	17	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	3	7
	B	12	0	0
	C	17	0	0

Vehicle Mix

Heavy Vehicle Percentages

	To

		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.03	7.82	0.0	A	11	17
C-AB	0.00	0.00	0.0	A	0	0
C-A					15	23
A-B					3	5
A-C					6	9

2020 Existing +10%, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.09	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2020 Existing +10%	PM	ONE HOUR	17:00	18:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	40	100.000
B		ONE HOUR	✓	9	100.000
C		ONE HOUR	✓	33	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	12	28
	B	8	0	1
	C	30	3	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.02	7.67	0.0	A	8	12
C-AB	0.01	6.21	0.0	A	3	5
C-A					27	41
A-B					11	17
A-C					25	38

2023 Opening Year Without Development, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		2.55	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2023 Opening Year Without Development	AM	ONE HOUR	08:00	09:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	10	100.000
B		ONE HOUR	✓	13	100.000
C		ONE HOUR	✓	17	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	3	7
	B	13	0	0
	C	17	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.03	7.84	0.0	A	12	18
C-AB	0.00	0.00	0.0	A	0	0
C-A					16	23
A-B					3	4
A-C					6	10

2023 Opening Year Without Development, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.05	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2023 Opening Year Without Development	PM	ONE HOUR	17:00	18:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	42	100.000
B		ONE HOUR	✓	9	100.000
C		ONE HOUR	✓	34	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	13	29
	B	8	0	1
	C	31	3	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.02	7.71	0.0	A	8	12
C-AB	0.01	6.20	0.0	A	3	4
C-A					28	42
A-B					12	18
A-C					27	40

2028 Design Year Without Development, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		2.50	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D5	2028 Design Year Without Development	AM	ONE HOUR	08:00	09:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	11	100.000
B		ONE HOUR	✓	14	100.000
C		ONE HOUR	✓	19	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	4	7
	B	14	0	0
	C	19	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.03	7.87	0.0	A	13	19
C-AB	0.00	0.00	0.0	A	0	0
C-A					17	26
A-B					4	6
A-C					6	10

2028 Design Year Without Development, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.12	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D6	2028 Design Year Without Development	PM	ONE HOUR	17:00	18:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	45	100.000
B		ONE HOUR	✓	10	100.000
C		ONE HOUR	✓	38	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	14	31
	B	9	0	1
	C	34	4	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.02	7.77	0.0	A	9	14
C-AB	0.01	6.20	0.0	A	4	6
C-A					31	46
A-B					13	19
A-C					28	43

2038 Design Year Without Development, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		2.52	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D7	2038 Design Year Without Development	AM	ONE HOUR	08:00	09:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	12	100.000
B		ONE HOUR	✓	15	100.000
C		ONE HOUR	✓	20	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	4	8
	B	15	0	0
	C	20	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.03	7.89	0.0	A	14	21
C-AB	0.00	0.00	0.0	A	0	0
C-A					18	28
A-B					4	6
A-C					7	11

2038 Design Year Without Development, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.06	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D8	2038 Design Year Without Development	PM	ONE HOUR	17:00	18:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	48	100.000
B		ONE HOUR	✓	10	100.000
C		ONE HOUR	✓	40	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	15	33
	B	9	0	1
	C	36	4	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.02	7.79	0.0	A	9	14
C-AB	0.01	6.19	0.0	A	4	6
C-A					33	49
A-B					14	21
A-C					30	45

2023 Opening Year With Development , AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		4.96	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D9	2023 Opening Year With Development	AM	ONE HOUR	08:00	09:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	25	100.000
B		ONE HOUR	✓	55	100.000
C		ONE HOUR	✓	17	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	18	7
	B	55	0	0
	C	17	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.13	8.75	0.1	A	50	76
C-AB	0.00	0.00	0.0	A	0	0
C-A					16	23
A-B					17	25
A-C					6	10

2023 Opening Year With Development, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.78	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D10	2023 Opening Year With Development	PM	ONE HOUR	17:00	18:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	80	100.000
B		ONE HOUR	✓	28	100.000
C		ONE HOUR	✓	34	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	51	29
	B	27	0	1
	C	31	3	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.07	8.30	0.1	A	26	39
C-AB	0.01	6.27	0.0	A	3	4
C-A					28	42
A-B					47	70
A-C					27	40

2028 Design Year With Development , AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		4.87	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D11	2028 Design Year With Development	AM	ONE HOUR	08:00	09:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	26	100.000
B		ONE HOUR	✓	56	100.000
C		ONE HOUR	✓	19	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	19	7
	B	56	0	0
	C	19	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.13	8.78	0.1	A	51	77
C-AB	0.00	0.00	0.0	A	0	0
C-A					17	26
A-B					17	26
A-C					6	10

2028 Design Year With Development , PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.79	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D12	2028 Design Year With Development	PM	ONE HOUR	17:00	18:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	83	100.000
B		ONE HOUR	✓	29	100.000
C		ONE HOUR	✓	38	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	52	31
	B	28	0	1
	C	34	4	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.07	8.36	0.1	A	27	40
C-AB	0.01	6.27	0.0	A	4	6
C-A					31	46
A-B					48	72
A-C					28	43

2038 Design Year With Development, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		4.83	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D13	2038 Design Year With Development	AM	ONE HOUR	08:00	09:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	27	100.000
B		ONE HOUR	✓	57	100.000
C		ONE HOUR	✓	20	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	19	8
	B	57	0	0
	C	20	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.13	8.82	0.2	A	52	78
C-AB	0.00	0.00	0.0	A	0	0
C-A					18	28
A-B					17	26
A-C					7	11

2038 Design Year With Development, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.74	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D14	2038 Design Year With Development	PM	ONE HOUR	17:00	18:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	86	100.000
B		ONE HOUR	✓	29	100.000
C		ONE HOUR	✓	40	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	53	33
	B	28	0	1
	C	36	4	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.07	8.37	0.1	A	27	40
C-AB	0.01	6.26	0.0	A	4	6
C-A					33	49
A-B					49	73
A-C					30	45

AECOM

Proposed Residenital Development at Rossana Lower, Rathnew, Co. Wicklow

Traffic and Transport Assessment

Karla Clarke

Project number: 60659397
60659397-ACM-XX-00-RP-TR-00-0001

September 2021

Delivering a better world

Quality information

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Revision History

Revision	Revision date	Details	Authorized	Name	Position
A	06.08.2021	Draft	CR	Carolyn Rollo	Associate Director
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Figures

Tables

1. Introduction

1.1 Background

AECOM has been appointed by Karla Clarke (the applicant) to prepare a Traffic and Transport Assessment (TTA) to accompany an outline planning application to Wicklow County Council (WCC) for a proposed residential development on a site located off the R761 in Rathnew, Co. Wicklow. This application would also result in works to the R761 which will comprise of road widening and realignment with a new shared footpath / cycle track provided along the western side of the carriageway. Should the applicant submit a full planning application then a more detailed TTA will be prepared which will include detailed junction modelling analysis.

The proposed development site is shown in Figure 1.1 and is bound by agricultural land to the north, west and south with the R761 bounding the site to the east. The subject site is greenfield with Figure 1.2 illustrating the proposed development layout.

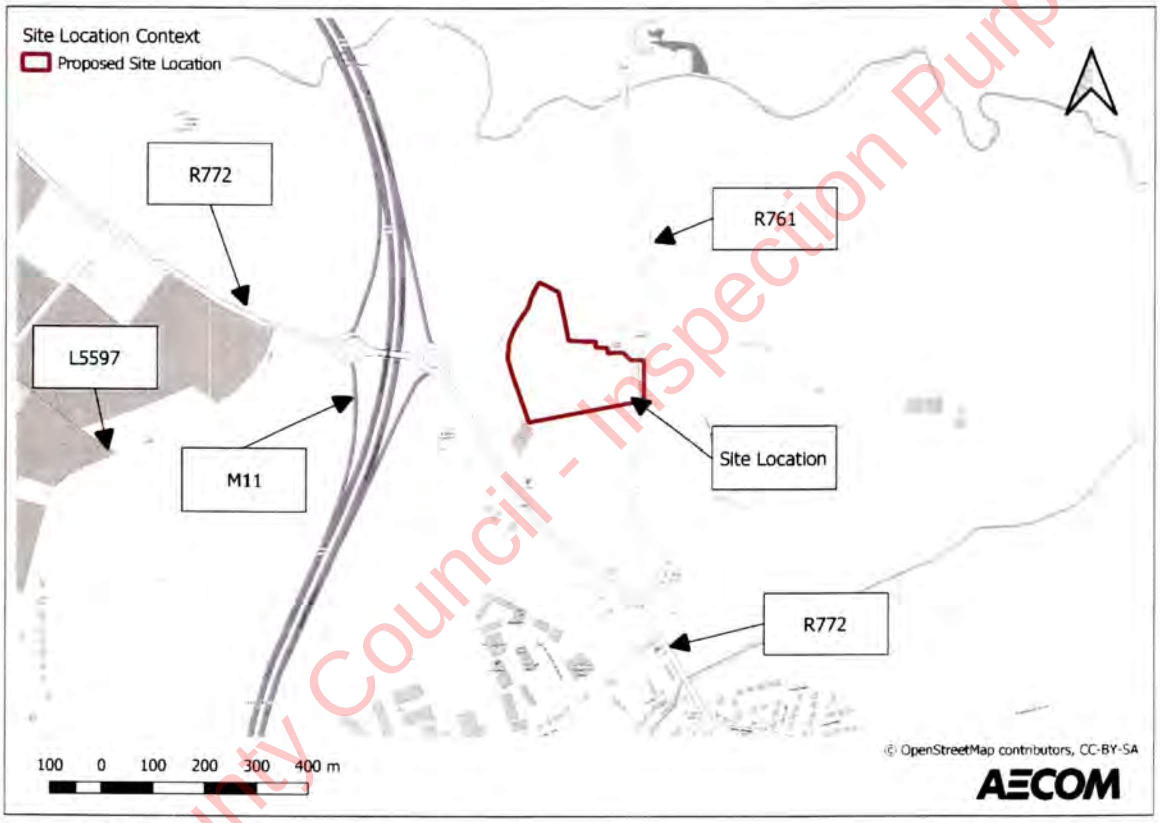


Figure 1.1 – Proposed Site Location

Figure 1.2 – Proposed Indicative Site Layout (Courtesy: P.D. Lane Associates)

1.2 Proposed Development

Proposed outline permission is being sought for 90 No. residential units (64 No. houses and 26 No. duplexes) and a childcare facility of 196 sq.m together with all associated site development works including estate roads, footpaths, car parking, bins & bicycle storage, boundary treatment, services infrastructure including watermains, foul sewerage, surface water sewerage and on-site attenuation tanks at Rossana Lower, Rathnew, Co. Wicklow.

The proposed development includes for measures to upgrade and realign the Newcastle Road (R761) which will provide for a new priority access into the site turning lanes at the entrance to the proposed development and Clermont College and a new pedestrian crossing. A sloped landscaped area located between the existing Clermont demesne wall and the new road realignment is proposed, and a partial demolition of Clermont demesne wall to facilitate the proposed realignment. A new public footpath / cycle lane is proposed along the western side of the proposed realignment from the site entrance to the roundabout junction at the Rathnew Relief Road.

A new surface water open drain is proposed from the proposed development along the western side of the proposed new public footpath / cycle lane which is then piped further south under the proposed realigned Newcastle Road (R761) to connect into the public surface water main near the roundabout junction along the Rathnew Relief Road. Watermain and foul sewerage connections are proposed into the existing public mains in the vicinity.

A breakdown of the proposed schedule of accommodation is shown in Table 1.1.

Table 1 1 – Schedule of Accommodation

Land Use	Type	Quantum
Houses	2 Bedroom	14
	3 Bedroom	40
	4 Bedroom	10
Duplex	1 Bedroom	6
	2 Bedroom	6
	3 Bedroom	14
Creche		196 sq.m
Standard Car Parking Spaces		184
Mobility Impaired Spaces		4
Electric Vehicle Spaces		8
Cycle Parking Spaces		84

1.3 Planning History

There is no history of planning applications on the respective site noted on the WCC Planning Portal.

1.4 Objectives

The main objective of this report is to examine the traffic impact of the proposed development on the road network for the proposed opening year (predicted as 2024) and identifying which junctions should have detailed traffic modelling undertaken as part of the full planning submission in accordance with the Transport Infrastructure Ireland (TII) Traffic and Transport Assessment Guidelines, May 2014. The traffic generated by the proposed development has been calculated and its impact on the road network has been assessed.

In order to complete this report, AECOM has made reference to the following documents:

- WCC Development Plan (2016 – 2022);
- The National Transport Authority (NTA) Traffic Management Guidelines (2003);
- Traffic Signs Manual (2019);
- The National Cycle Manual The National Transport Authority (2011);
- Design Manual for Urban Roads and Streets, DMURS, May 2019 (Dept of Transport, Tourism and Sport/ Dept of Environment, Community & Local Govt); and
- PE-PDV-02045 Traffic and Transport Assessment Guidelines (May 2014), TII.

1.5 Study Methodology

The methodology adopted for this report can be summarised as follows:

- **Existing Transport Infrastructure** – AECOM have collated information on the public transport, walking and cycling facilities in the surrounding area of the site by means of a desktop study and a site visit.
- **Development Proposals** – Description of the proposed development which includes proposed improvements to the R761 Regional Road as provided by the architect and AECOMs civil team.
- **Existing Traffic Flow Assessment** – Due to the ongoing Covid-19 pandemic traffic flow data for the weekday morning and evening peak conditions was obtained from a planning application for lands at Clermont to the south of the site (WCC Planning Ref: 161444). The data for this project was collected on the 29th of January 2016. The traffic flows that were utilised as part of this application were updated as per the TII growth factors.
- **Development Trip Generation** – Based on the proposed development land use characteristics, AECOM reviewed trip rate data for similar uses and developed anticipated traffic flows, by using the industry standard Trip Rate Information Computer System (TRICS) database (Version 7.8.2 on the 23rd of July 2021). These flows were then assigned to the existing network having regard for observed traffic patterns on the

surrounding road network and the committed development flows of the Clermont site (WCC Planning Ref: 161444).

- **Percentage Impact Assessment –** The traffic impact of the proposed development at key road network links was ascertained as a percentage change compared to existing patterns. AECOM have identified which junctions should have detailed traffic modelling analysis undertaken as part of the full planning submission to WCC in accordance with the TII Traffic and Transport Assessment Guidelines, May 2014.

1.6 Report Structure

The remainder of this report is divided into the following sections:

- Section 2 details the existing site characteristics including the surrounding transport infrastructure and any future infrastructure proposals;
- Section 3 discusses the proposed development as part of this outline application and gives a brief outline of the proposed external road upgrades, internal road network and site layout;
- Section 4 details the trip generation and the methodology for the traffic impact assessment of the proposed development;
- Section 5 outlines additional reports that should accompany a full planning application to WCC which would include a Design Manual for Urban Roads and Streets (DMURS) statement of compliance, Outline Construction Traffic Management Plan (CTMP) and Outline Mobility Management Plan (MMP);
- Section 6 provides a summary of AECOM's appraisal together with the main conclusions of the assessment.

2. Existing Conditions

2.1 Introduction

This chapter includes a review of the existing baseline conditions of the site including public transport provision, walking and cycling facilities and the current operation of the surrounding public network. AECOM undertook a site audit on Wednesday 13th July 2021 to understand the existing on-site conditions. The findings from AECOM's desktop study and site audit are detailed within this chapter.

2.2 Existing Site Context

The subject site is situated on greenfield lands located along the R761 in Rathnew Co. Wicklow. The site is located approximately 0.85 km from Rathnew Village, 1.2 km from the M11 Junction 16 interchange and 3.9 km from Wicklow Town centre.

The site is bounded to the east by the R761 and by agricultural lands to the north, south and west.

Figure 2.1 shows the location of the site in relation to Wicklow Town.

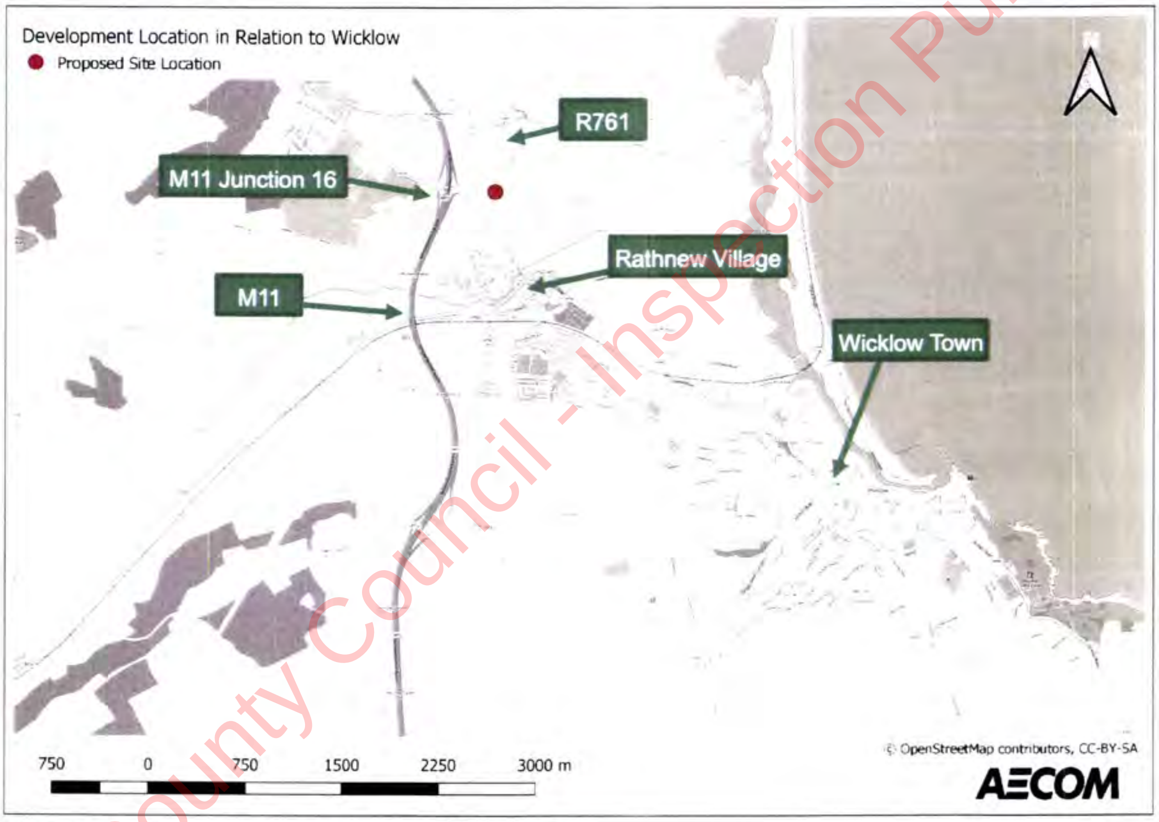


Figure 2.1 – Site Location in Relation to Wicklow Town

2.3 Land Use Zoning

The subject lands are zoned 'R2' within the Wicklow County Development Plan 2016 – 2022 and are illustrated in Figure 2.2 below.

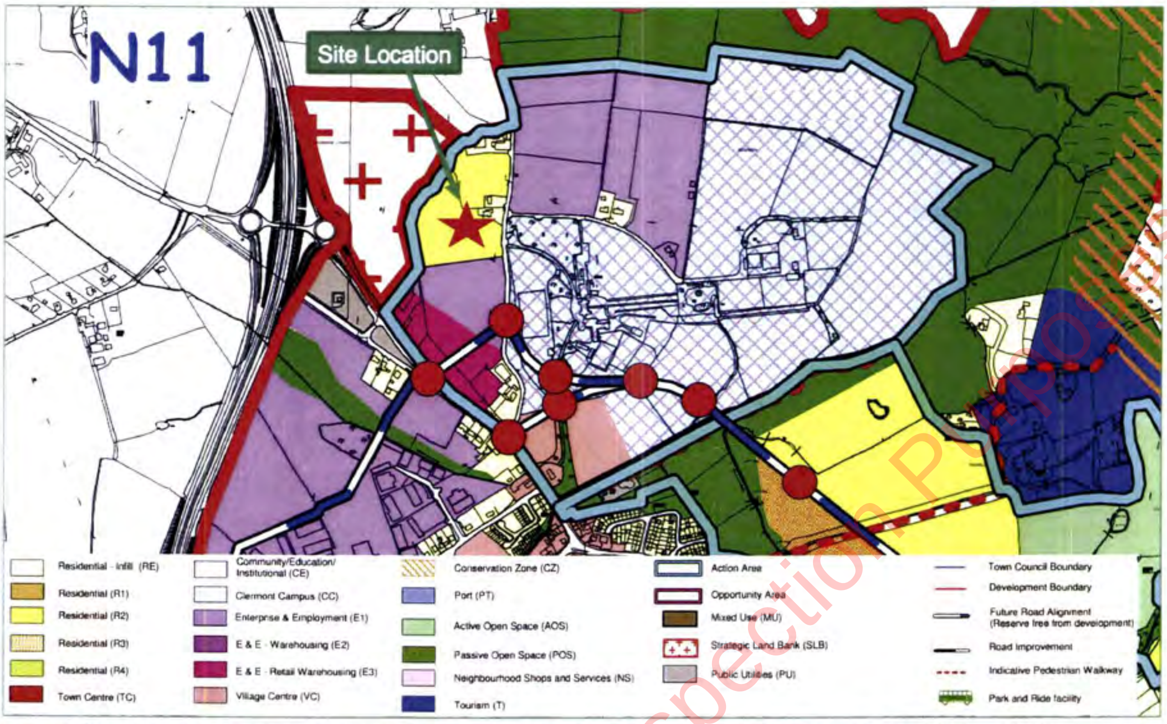


Figure 2.2 – Land Use Zoning (Source: Wicklow Town – Rathnew Development Plan 2013 – 2019)

2.4 Existing Site Access

At present there is currently one informal access point into the site which serves the existing greenfield lands. Figure 2.3 shows the location of the existing access point into the site. The posted speed limit along the R761 at the site access is 80km/hr.

Figure 2.3 – Existing Site Access

2.5 Existing Transportation Infrastructure

2.5.1 Background

An important stage in the development of a TTA is the identification and appreciation of the local network's existing transport conditions and vehicle movement characteristics.

An audit of the local road network has therefore been undertaken to establish the existing transport conditions and vehicle movement patterns across the existing network.

2.5.2 Existing Pedestrian / Cyclist Environment

2.5.2.1 R761

The R761 is a 6.0m wide single carriageway regional road which is located along the eastern boundary of the site and runs north of Rathnew Village via the R791. At present there are no footpaths provided along the R761 except at the recently constructed roundabout located to the south of the site as part of a section of the Tinakilly Relief Road. Public street lighting is provided in the vicinity of the site along the eastern and western side of the carriageway. As part of the scheme proposals it is planned to upgrade the R761 from the site access to the Aldi roundabout, these upgrades consist of widening and realigning the R761 and the providing a shared footpath / cycle track along the western side of the road. Figure 2.4 illustrates a section of the R761.

Figure 2.4 – R761 North South View

2.5.2.2 R722

The R772 is a regional road which runs from Rathnew Village to Interchange 16 of the M11. At its junction with the R761, the carriageway is approximately 10m wide. The junction of the R761 / R772 has been upgraded from a priority junction to a signalised junction which features dedicated crossing facilities for pedestrians on the northern and eastern arm of the junction. The posted speed limit along this road is 50km/hr which transitions to 80km/hr towards the M11 Junction 16. Figure 2.5 shows the junction layout.

Figure 2.5 – R722 / R761 Signalised Junction

2.5.3 Sustainable Transport – Bus

As graphically illustrated in Figure 2.6, the site benefits from bus transport connections allowing residents to travel by this sustainable mode. As part of the scheme proposals, the R761 is to be upgraded which will feature a 3.5m wide shared footpath / cycle track which will tie back in with the existing pedestrian facilities at the Aldi Roundabout.

The nearest bus stops in the vicinity of the site are situated along the R772. These stops are currently served by bus service number 133, which connects Wicklow Town with Bray, Dublin Airport, Dublin and Ashford.

The 740A bus stop is located 850m to the south of the site (10 min walk) and this bus services Dublin Airport. By way of the M/N11.

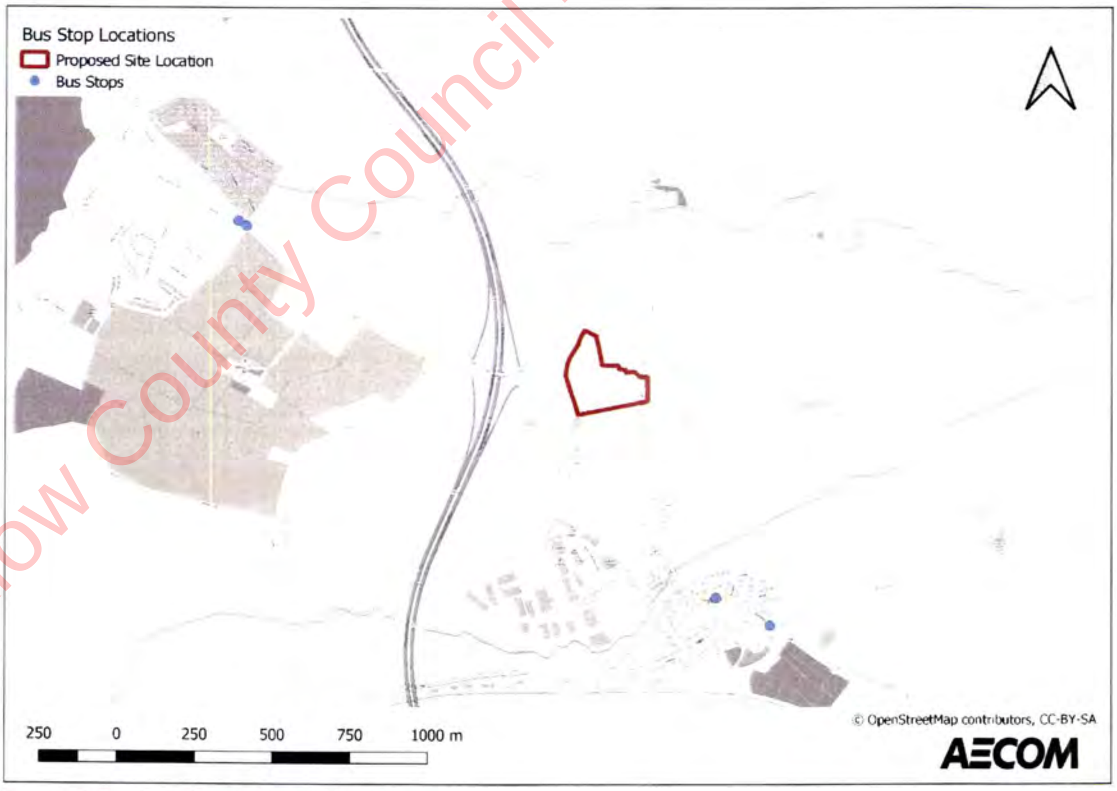


Figure 2.6 – Bus Stops in the Vicinity

Table 2.1 – Bus Servicing

Service Number	Route / Destination	Mon – Fri Peak Hour Frequency	Sat-Sun Frequency
133	Dublin Airport / Kilmacanoge / Kilpedder / Rathnew / Wicklow	Every Hour	Every Hour
740A	Dublin Airport	Every 1.5 hours	One

2.5.4 Sustainable Transport – Rail

The closest rail station to the development is Wicklow train station, located approximately 3.6km from the site. Table 2.2 illustrates the available services and typical frequencies available from this station.

Table 2.2 – Train Services

Route / Destination	Duration	Frequency
Connolly Train Station — Blackrock – Dun Laoghaire Mallin – Bray Daly –Wicklow Train Station– Wexford O'Hanrahan – Rosslare Strand – Rosslare Europort	1hr	Every 4 hours

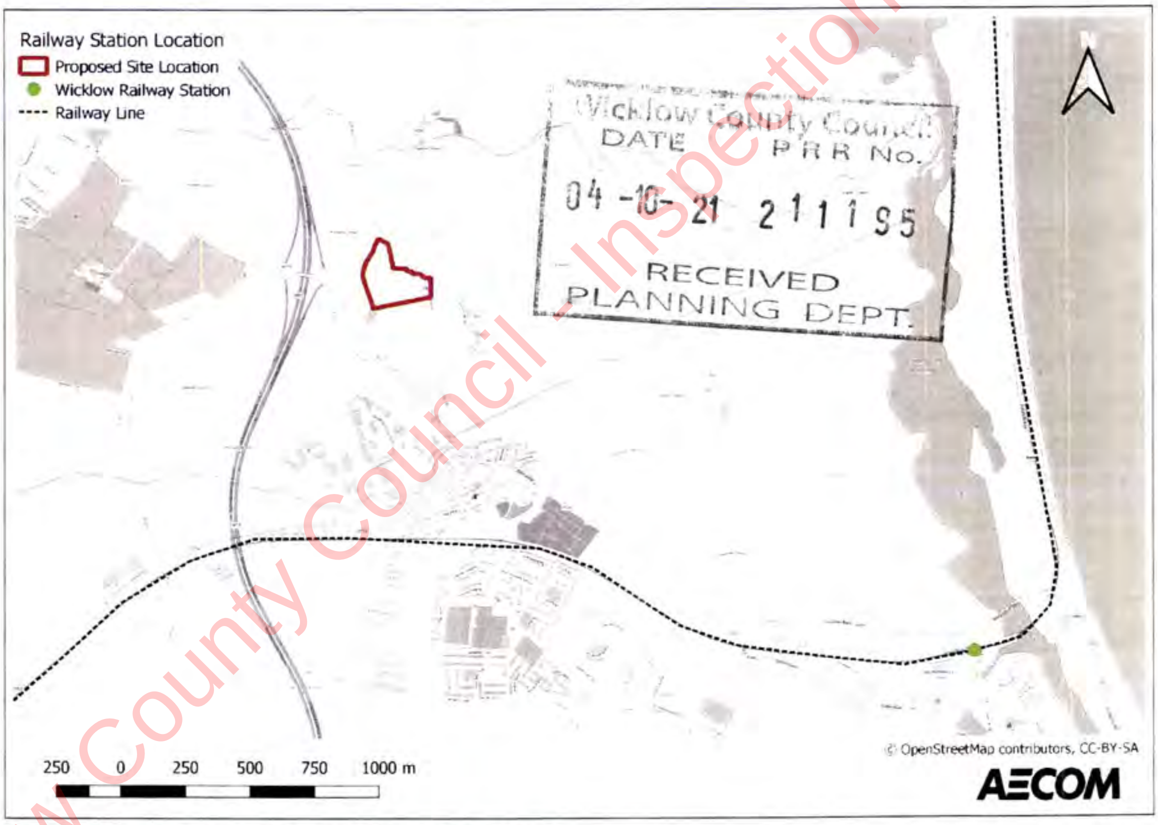


Figure 2.7 – Site Proximity to Wicklow Train Station

2.6 Emerging Transportation infrastructure

2.6.1 Local Road Proposals

From the Wicklow County Development Plan, there is a roads objective to the south of the site which is part of the Tinakilly Relief Road. A section of this road has been completed as part of the application for the Aldi to the south, AECOM understand that a planning submission is to be lodged for the remainder of this roads objective.

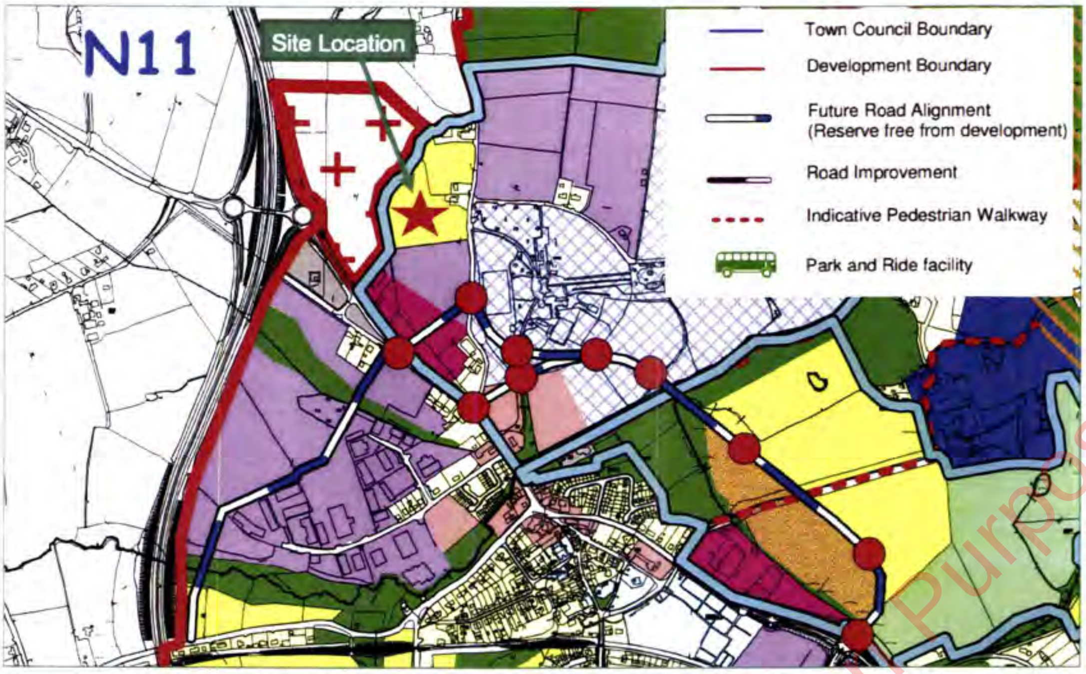


Figure 2.8 – Proposed Roads Objective (Source: Wicklow Town – Rathnew Development Plan 2013 – 2019)

2.7 Road Collision Statistics

A review of the Road Safety Authority (RSA) traffic collision database has been undertaken for the road network in the vicinity of the proposed site to identify any collision trends. This review will assist to identify any potential safety concerns in relation to the existing road network.

Traffic collision data was obtained for the period 2005 – 2016, which is the most recent data available from the RSA website. It should be noted that information relating to report incidents for the years 2017, 2018, 2019 and 2020 is not yet available on the Road Safety Authority (RSA) website. The RSA records detail only those occasions where the incident was officially recorded such as the Garda being present to formally record details of the incident.

The incidents are categorised into class of severity, which includes minor, serious and fatal collisions. The collision locations are shown in Figure 2.9 below.

Upon reviewing the RSA website, it was found that in the vicinity of the site there has been 1 no. minor collision on the R761 which involved a single vehicle collision in 2006. This indicates that from the reported collision there are no road safety concerns in the vicinity of the site.

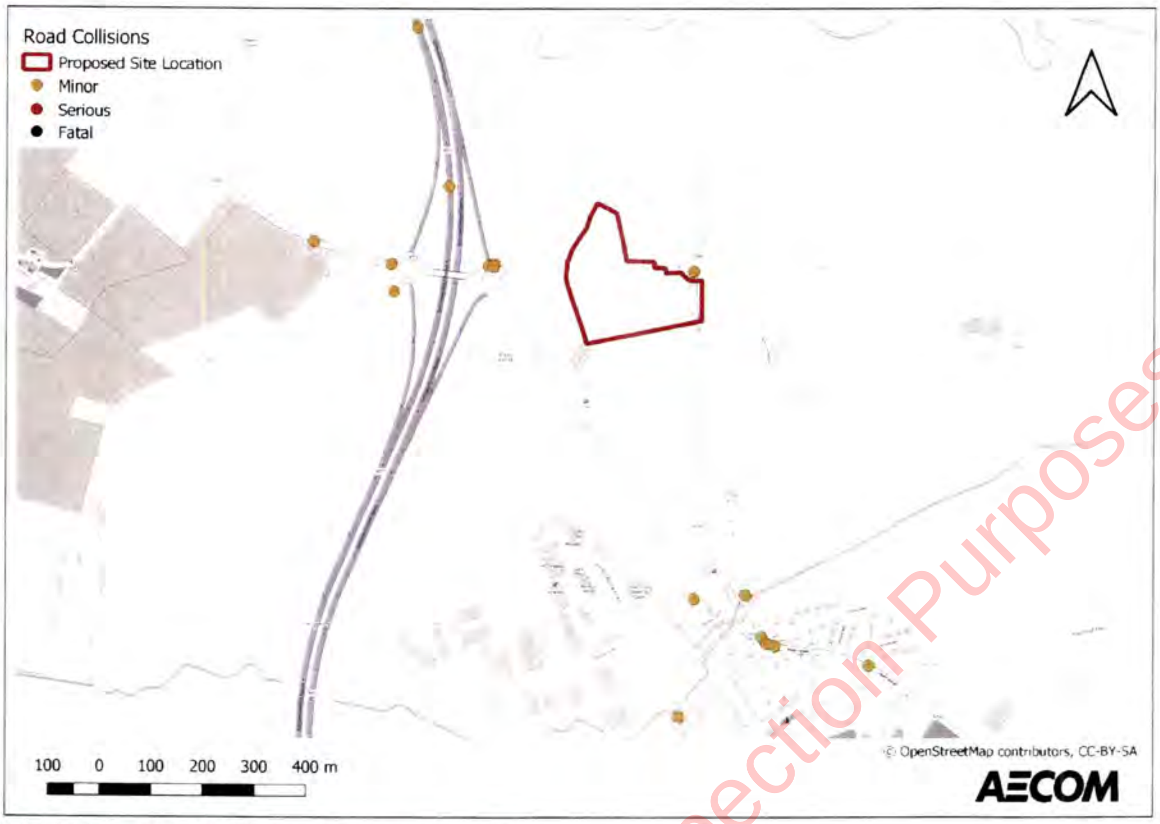


Figure 2.9 – Road Collisions (Source: www.rsa.ie)

2.8 Existing Conditions Summary

The subject site is positioned within a rural environment yet benefits from access via sustainable forms of travel including walking, cycling and public transport which will be maximised via the provision of a new pedestrian route along the R761 which currently there is no provision. This will greatly improve the likelihood of perspective residents walking / cycling to / from the subject site and ensures that there is increased permeability with the surrounding amenities and Rathnew Village.

3. Proposed Development

3.1 Introduction

This chapter details the proposed development with regard to the transportation elements which include the internal roads layout, proposed pedestrian/ cycling infrastructure and parking provisions.

3.2 Proposed Development

Proposed outline permission is being sought for 90 No. residential units (64 No. houses and 26 No. duplexes) and a childcare facility of 196sq.m together with all associated site development works including estate roads, footpaths, car parking, bins & bicycle storage, boundary treatment, services infrastructure including watermains, foul sewerage, surface water sewerage and on-site attenuation tanks.

The proposed development includes for measures to upgrade and realign the Newcastle Road (R761) which will provide for turning lanes at the entrance to the proposed development and Clermont College and new pedestrian crossing. A sloped landscaped area located between the existing Clermont demesne wall and the new road realignment is proposed, and a partial demolition of Clermont demesne wall to facilitate the proposed realignment. A new public footpath / cycle lane is proposed along the western side of the proposed realignment from the site entrance to the roundabout junction at the Rathnew Relief Road.

3.3 R761 Road Upgrades

It is proposed to upgrade a portion of the R761 Regional Road from the site access to the Aldi Roundabout, the upgrades consist of widening and realigning the R761 which will feature a new 3.5m shared footpath / cycle track along the western side of the road. Details in relation to these upgrades are provided in the Infrastructure Design Report which accompanies this outline application. Figure 3.1 illustrates a typical cross section through the road with Figure 3.2 illustrating the extent of works to be undertaken

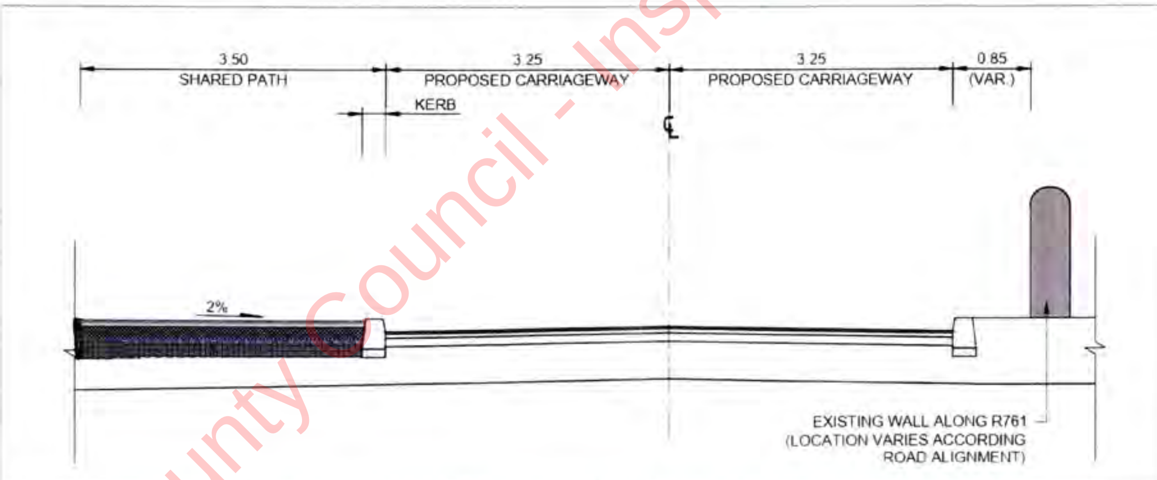


Figure 3.1 – Typical Cross Section (AECOM Drawing: PR60659397-ACM-XX-00-SK-CE-00-0009)

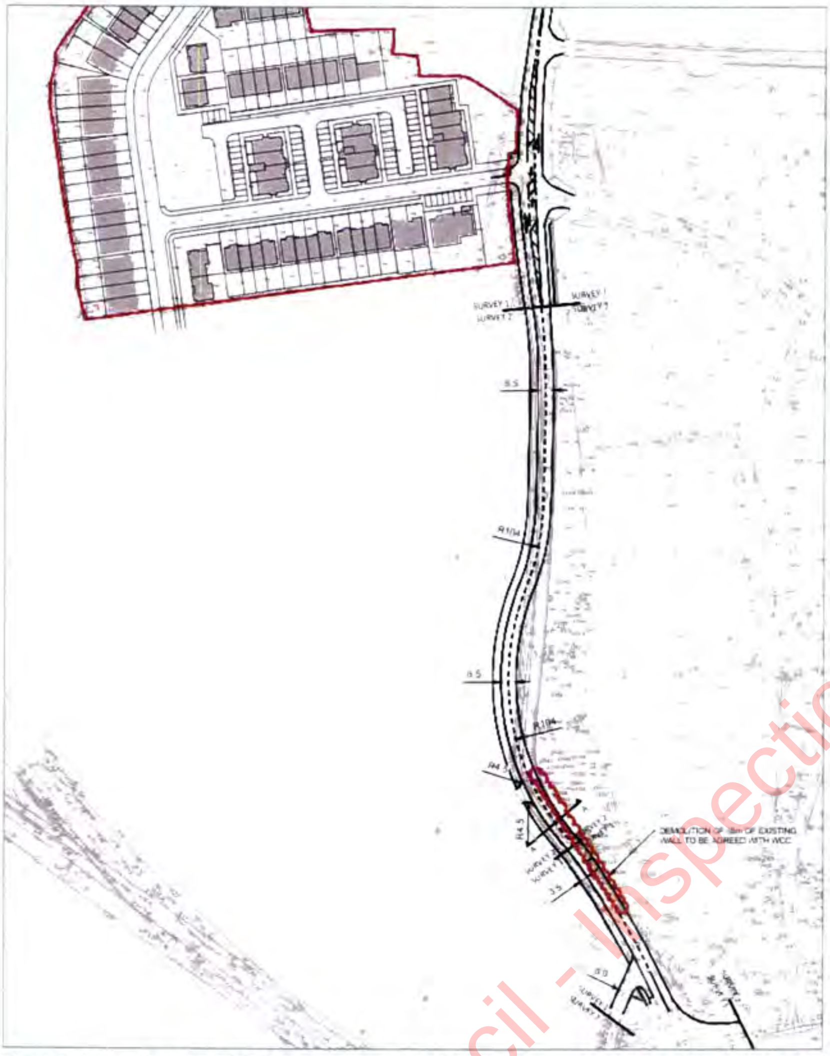


Figure 3.2 – Extent of R761 Upgrades (AECOM Drawing: PR60659397-ACM-XX-00-SK-CE-00-0009)

3.4 Site Access

There will be 1 no. vehicular access serving the subject site, the vehicular access point will be located at the eastern boundary of the site. As part of the upgrades to the R761 a right turn pocket would be included into the subject site which will form a staggered crossroads with the access to the Wicklow County Campus. The proposed site access is illustrated in Figure 3.3.

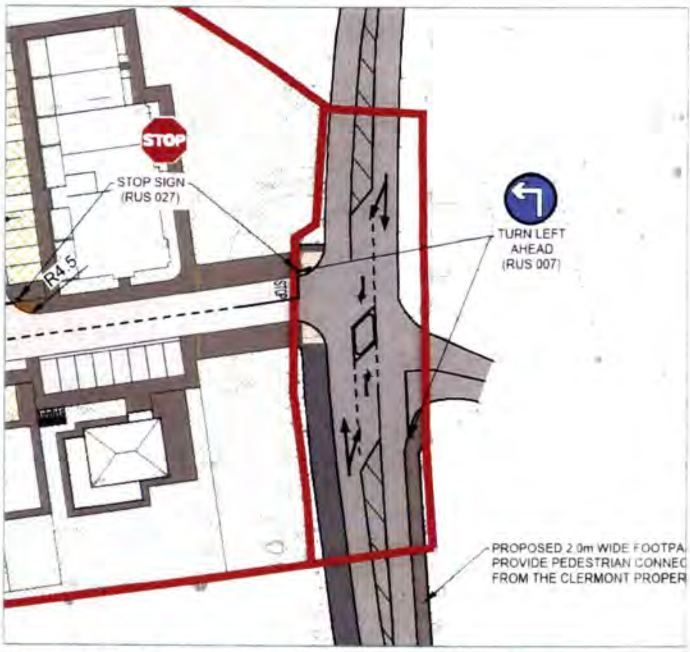


Figure 3.3 – Proposed Site Access with Right Turn Pocket

3.5 Internal Roads Layout

The proposed internal access road is to be 6m wide in accordance with DMURS which will cater for the demands of the proposed development whilst also ensuring that vehicle speeds remain low, the speed limit within the site is to be set at 30km/hr. Where perpendicular parking is proposed on both sides of the road, the road width is to be 6m wide to ensure that vehicles can safely access and egress from these spaces.

3.6 Pedestrian and Cyclist Permeability

The site has been designed to ensure that desire lines are met for pedestrians throughout the scheme by means of providing safe crossing points with tactile paving at junctions and reducing the kerb radii to 4.5m to ensure vehicle speeds remain low. Given that the internal speed limit is to be set to 30km/hr cyclists are able to cycle on-road which is in compliance with DMURS that streets should be self-regulating.

3.7 Servicing

An AutoTrack analysis has been undertaken to demonstrate the capability of the development to cater of a 10.2m bin lorry. The results of the analysis show that the site layout can accommodate a 10.2m long bin accessing, manoeuvring and egressing the site. This is illustrated in Figure 3.4 and AECOM Drawing: 60659397-ACM-XX-00-DR-CE-00-0102.

Figure 3.4 – Swept Path Analysis (AECOM Drawing: 60659397-ACM-XX-00-DR-CE-00-0102)

3.8 Visibility Splay

As part of ongoing discussions with WCC, WCC have indicated that the R761 road upgrade is to adopt DMURS design with reduction in the speed limit from 80km/hr to 50km/hr. In accordance with DMURS, sightlines of 45m are required having regards to the speed limit along the R761. The visibility splay requirement is achieved at the subject site access from a 2.4m setback to the edge of the road. Figure 3.5 illustrates the visibility splay requirement for the proposed site access with Figure 3.4 illustrating the visibility splays at the internal junctions. The visibility splays are also shown on AECOM Drawing: 60659397-ACM-XX-00-DR-CE-00-0101.

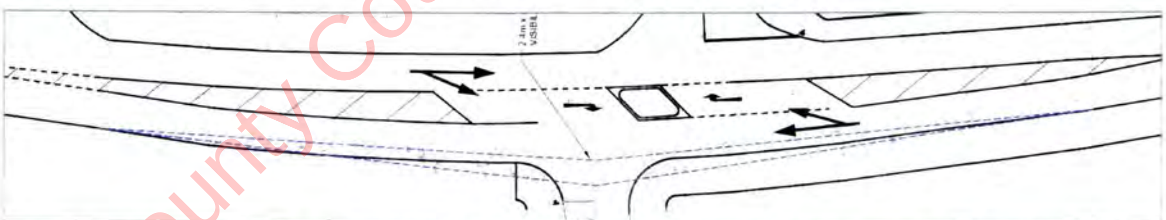


Figure 3.5 – Visibility Splay At Proposed Site Access (AECOM Drawing: 60659397-ACM-XX-00-DR-CE-00-0101)

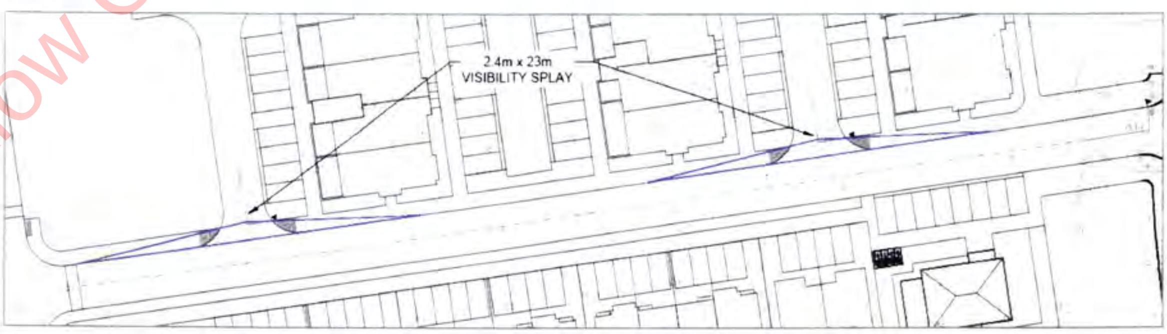


Figure 3.6 – Visibility Splay at Internal Junctions (AECOM Drawing: 60659397-ACM-XX-00-DR-CE-00-0101)

3.9 Parking Strategy

3.9.1 Standard Vehicle Parking

In order to determine the appropriate quantum of vehicle parking for the proposed development, reference has been made to the current WCC Development Plan (2016 – 2022).

The WCC Development Plan 2016 – 2022, details the proposed quantum of car parking to be provided based on the proposed land uses on the subject site. With regard to the proposed development schedule (64 no. houses, 24 no. duplex and 1 no. childcare facility), the associated WCC car parking standards are outlined in Table 3.1.

Table 3.1 – WCC Development Plan Vehicle Parking Standards & Development Parking Provision

Description	Quantum		WCC Parking Standards			Proposed Parking Provision
			Parking Required		Parking to be Provided	
Houses	64	units	1-2 per unit		64 -128	128
Apartments	26	units	1-2 per unit		26 - 52	48
Childcare Facility	196	sqm	0.5 space per staff member	1 space per 10 children	5[1]	8
Total					96 (186)	184

In regard to the development proposals for the residential units and childcare facility, it is noted that the proposed car parking provisions for this development are in compliance with the WCC standards.

Mobility Impaired Parking

The appropriate level of mobility impaired parking for the proposed development will be provided in accordance with the WCC requirements. It is typical that 4% of car parking spaces be suitable for use by disabled persons which equates to 1 no. space being required. It is proposed to provide 4 no. mobility impaired spaces.

Electric Vehicle Parking

The appropriate level of electric vehicle parking for the proposed development will be provided in accordance with the WCC Development Plan requirements.

The development plan requires that for residential developments '*Shared residential car parking areas shall be constructed (including provision of necessary wiring and ducting) to be capable of accommodating future Electric Vehicle charging points, at a rate of 10% of space numbers*' which equates to 5 no. spaces being required.

The proposed development will provide 8 no. electric vehicle parking spaces which is in line with the WCC Development Plan.

3.9.2 Cycle Parking

Cycle parking for the proposed development should be provided in accordance with the WCC Development Plan requirements. The WCC Development Plan 2016-2022 details the proposed quantum of cycle parking to be provided based on the proposed land uses of the subject site. With regard to the proposed development schedule (64 no. houses, 26 no. duplex and 1 no. childcare facility), the associated WCC cycle parking standards are outlined in Table 3.2 while Table 3.3 details the proposed cycle parking for the subject site.

Table 3.2 – WCC Cycle Parking Standards

Description	WCC Parking Requirement
Residential Units	1 space per bedroom + 1 visitor space per 2 units
Schools	20% of pupil registration numbers / minimum number of 10 no. spaces

[1] *Based on an anticipated staffing number of 5 with 25 children.*

Table 3.3 – Proposed Cycle Parking Provisions

Description	Quantum		WCC Parking Requirement	Development Provision
			Total	Total
Apartments	46	Bedrooms	59	74
Childcare Facility	25	Children	10	10
Totals			69	84

3.10 Summary

The proposed development comprises of 90 residential units (64 no. houses and 26 no. duplex) and a childcare facility. The scheme will provide 184 no. car parking spaces including 4 no. mobility impaired and 8 no. electric vehicle spaces along with 74 cycle parking spaces to be provided for the apartments and 10 cycle parking spaces for the childcare facility.

As part of the development it is proposed to upgrade the R761 which would involve widening and realignment of the road with a shared footpath / cycle track provided along the western side of the carriageway. The upgrades to the R761 would be a welcome improvement this section of the road currently lacks any such facilities. This will improve the likelihood of perspective residents walking and cycling to and from the proposed development whilst also a benefit to the Wicklow Count Campus.

4. Trip Generation and Distribution

4.1 General

The purpose of this section is to determine the overall number of trips that are anticipated to be generated by the proposed development. The anticipated traffic generated by the proposed development has been distributed onto the adjacent road network to identify which junctions would need to have detailed traffic modelling undertaken as part of the full planning application. Figure 4.1 below shows the study area in relation to the subject site.

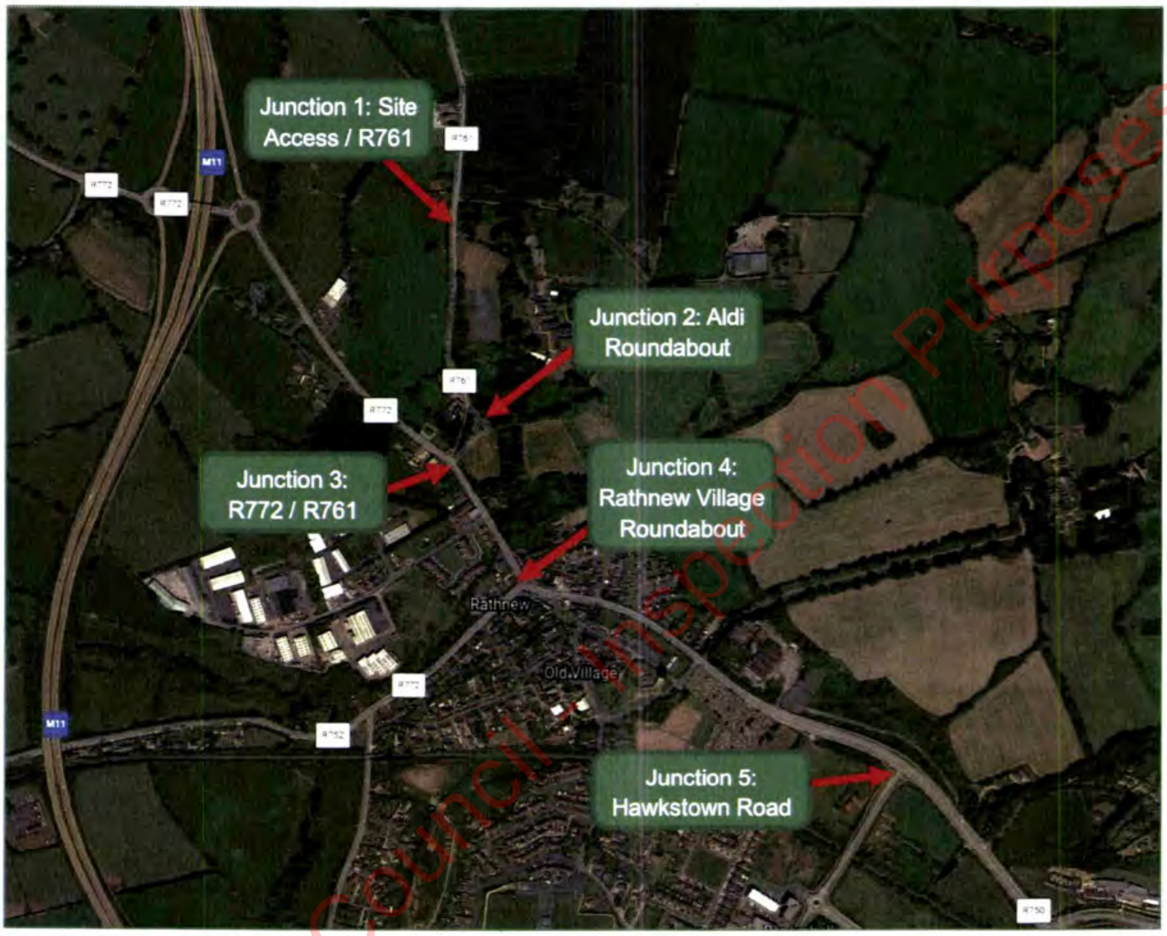


Figure 4.1 – Study Area (Source: Google Earth)

4.2 Trip Rates and Generation

In order to determine the potential vehicle trip generation for the proposed development, trip rates were taken from the industry standard TRICS database for the proposed land uses using the latest version of the software (version 7.8.2). A multi-modal assessment was undertaken to determine the potential trip generation associated with various modes of travel such as pedestrian, cyclists, public transport and vehicles. For the purposes of this TTA, AECOM has focussed on vehicle trips only. The full outputs from the TRICS analysis have been included within Appendix B of this report.

Table 4.1 illustrates the vehicle trip generation using TRICS for the subject site land uses (housing, apartments and creche).

Table 4.1 – Anticipated Development Vehicle Trip Generation

Land Use	Trip Gen			
	AM Peak (08:00 – 09:00)		PM Peak (17:00 – 18:00)	
	Arrivals	Departures	Arrivals	Departures
Houses	9	26	24	11
Apartments	2	5	5	2
Creche	4	4	4	4
Total Two-way Movement	**50**		**49**	

The review identifies that the proposed development may generate an additional 50 no. two-way vehicular trips during the weekday morning peak hour and an additional 49 no. two-way vehicle trips during the evening peak hour, respectively.

4.3 Trip Distribution & Assignment

To understand the potential distribution of the vehicle trips arriving and departing the site, the base traffic survey results have been interrogated as part of the Lands at Clermont TTA (WCC Planning Ref: 161444). The base traffic surveys indicate the direction that motorists currently travel to / from when arriving onto the immediate road network adjacent to the site during the typical peak periods. Figure 4.2 illustrates the trip distribution splits across the road network. Appendix A illustrates the proposed Baseline Traffic Flow patterns during the morning and evening peak hours on the surrounding road network.

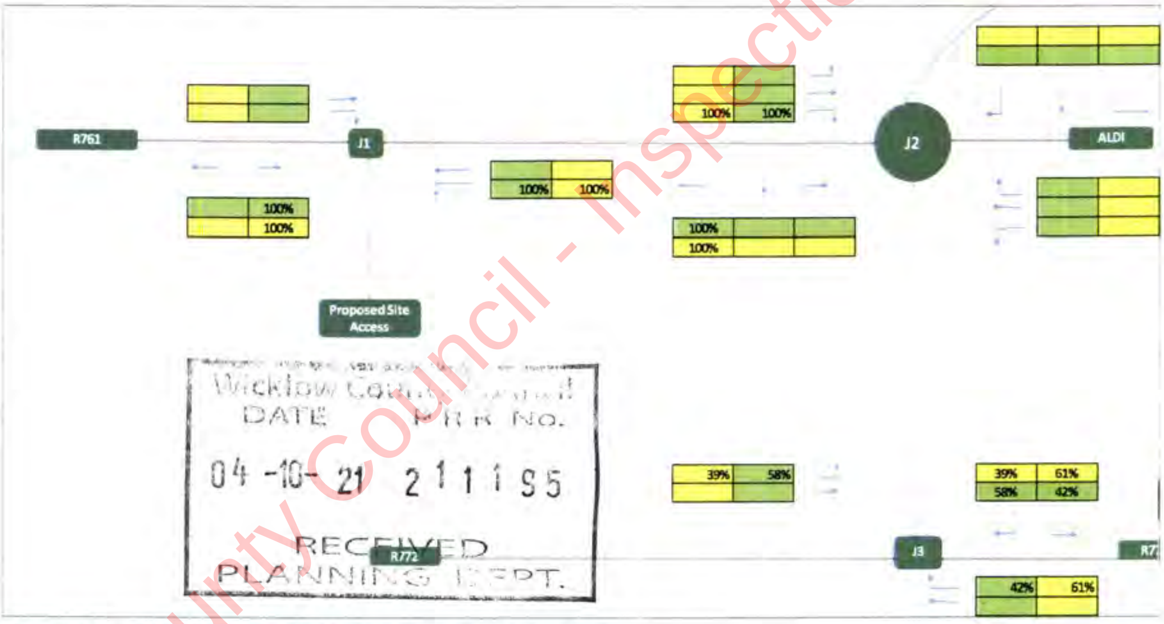


Figure 4.2 – Trip Distribution Morning and Evening Peak

4.4 Traffic Growth

The TTA will adopt an Opening Design Year of 2024. In accordance with TII Guidance, Future Design years (+5 and +15 years) of 2029 and 2039 will therefore be adopted.

The TII 'Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections (May 2019)' sets out growth rates for forecasting future year traffic for use in scheme modelling and appraisal. It is noted that in respect of Rathnew, which is in the 'Wicklow County Council area, the growth during the period 2016 – 2030 is set at 1.57% per annum for Central Growth, reducing to 0.51% per annum from 2030 – 2040 (LV rates used).

The development will be assessed for the opening year of the development (2023) and the two horizon year assessments (2028 and 2038), as per the TII Traffic Assessment Guidelines. The assessment years are as follows:

- 2016 to 2024 – 1.1327 (or 13.27%);
- 2016 to 2029 – 1.2245 (or 22.45%); and
- 2016 to 2039 – 1.2852 (or 28.52%).

4.5 Threshold Analysis

The TII Guidelines for Transport Assessments state that the thresholds for junction analysis in Transport Assessments are as follows:

- *'Traffic to and from the development exceeds 10% of the existing two-way traffic flow on the adjoining highway.'*
- *'Traffic to and from the development exceeds 5% of the existing two-way flow on the adjoining highway, where traffic congestion exists or will exist within the assessment period or in other sensitive locations.'*

4.6 Impact of the Proposed Development

4.6.1 Local Road Network

A comparison has been made between the pre-development and post-development scenarios, to identify the percentage impact of the development.

The projected percentage impact of the operational traffic on the surrounding road junctions in the year of opening (2024) is set out in Table 4.2 and shown indicatively in Figure 4.3.

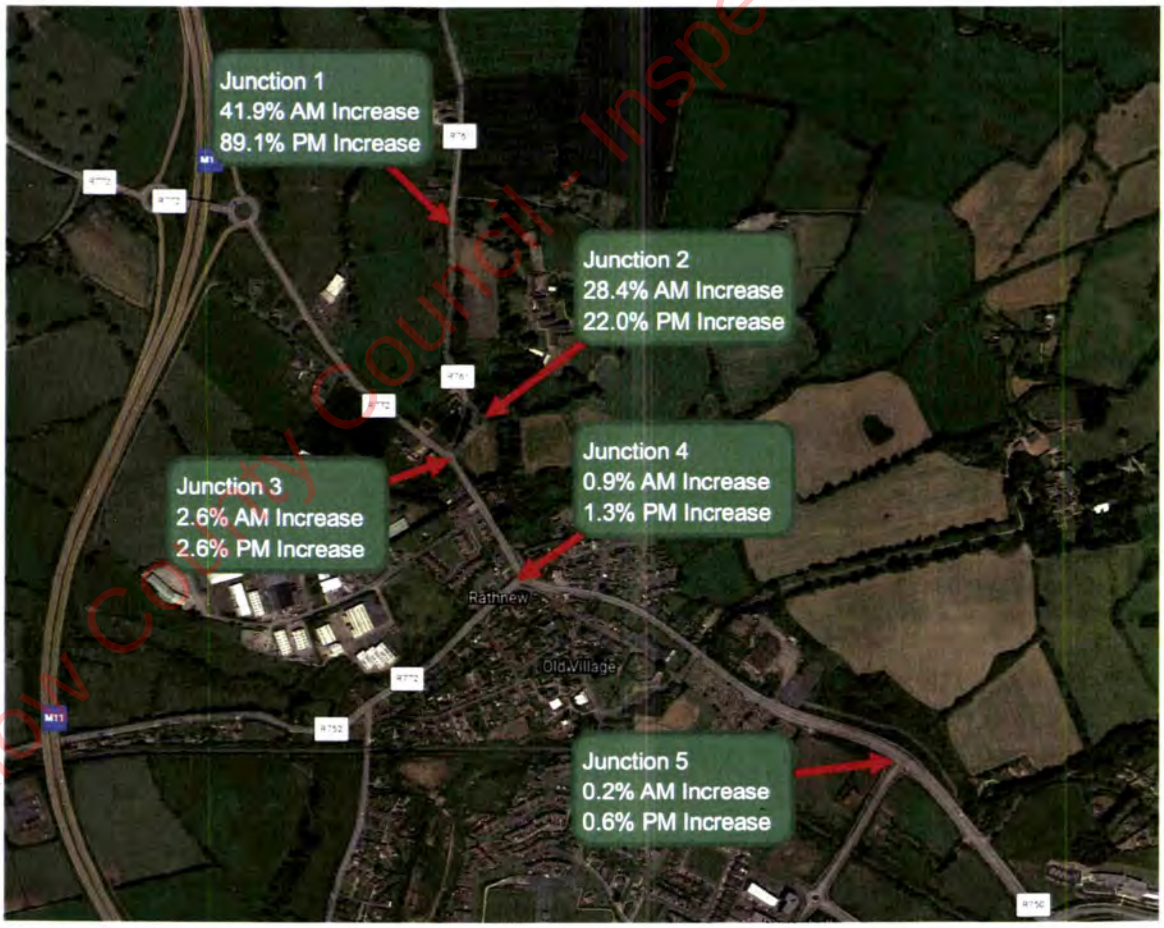


Figure 4.3 – Percentage Impact Increase at Junctions (Source: Google Earth)

It should be noted that the opening year of the development has been assessed only. Any future year base flows would be greater than the flows presented in Table 4.2, hence a smaller percentage impact in comparison to the development flows would be recorded.

Table 4.2 – Percentage Impact Analysis (2024 Opening Year)

Junction	Time Period	Existing Flows	Proposed Dev Flows	% Impact
Junction 1 – Site Access / R761	AM	120	50	41.9%
	PM	56	49	89.1%
Junction 2 – Aldi Roundabout	AM	177	50	28.4%
	PM	225	49	22.0%
Junction 3 – R772 / R761	AM	1943	50	2.6%
	PM	1917	49	2.6%
J4 – Rathnew Village Roundabout	AM	2268	21	0.9%
	PM	2281	30	1.3%
J5 – Hawkstown Road Junction	AM	1952	5	0.2%
	PM	1934	11	0.6%

The percentage impact of the operational phase will result in an impact of:

- 41.9% and 89.1% upon the Site Access / R761 junction in the respective morning and evening peaks;
- 28.4% and 22.0% upon the Aldi roundabout in the respective morning and evening peaks;
- 2.6% and 2.6% upon the R772 / R761 signalised junction in the respective morning and evening peaks;
- 0.9% and 1.3% upon the Rathnew Village roundabout in the respective morning and evening peaks; and
- 0.2% and 0.6% upon the Hawkstown Road junction in the respective morning and evening peaks.

Each junction is discussed in more detail in the paragraphs below

Junction 1: Based on the TII Traffic and Transport Guidelines (May 2014), given that the impact upon this priority junction does exceed 10% of the existing two-way traffic flow, modelling is required at this junction.

Junction 2: Based on the TII Traffic and Transport Guidelines (May 2014), given that the impact upon this roundabout does exceed 10% of the existing two-way traffic flow, modelling is required at this junction.

Junction 3: Based on the TII Traffic and Transport Guidelines (May 2014), given that the impact upon this signalised junction does not exceed 10% of the existing two-way traffic flow, modelling is not required for this junction. The traffic impacts upon this junction will be nominal.

Junction 4: Based on the TII Traffic and Transport Guidelines (May 2014), given that the impact upon this roundabout does not exceed 10% of the existing two-way traffic flow, modelling is not required for this junction. The traffic impacts upon this junction will be nominal.

Junction 5: Based on the TII Traffic and Transport Guidelines (May 2014), given that the impact upon this signalised junction does not exceed 10% of the existing two-way traffic flow, modelling is not required for this junction. The traffic impacts upon this junction will be nominal.

It should be noted that the relatively high percentage impact experienced at junction 1 and junction 2 is due to the low levels of existing traffic along the road network.

4.7 National Road Network

An assessment of the traffic impacts on the M11 shows that the impact is well below 5% as shown in Table 4.3 below.

Table 4.3 – Percentage Impact on the M11

Impact of the Potential Development on the M11 Junction 16	AM	PM
Background Traffic Growth	2733	3194
Post Scheme Traffic Flows	29	19
Percentage Increase in Flow	1.1%	0.6%

It can be seen from Table 4.3 that the percentage impact of the proposed development flows identifies a maximum of 1.1% impact upon the morning base on the M11 Motorway, whilst in the PM peak the percentage impact is 0.6% upon the existing base. Given that the percentage impacts are relatively low in relation to the existing base flows, no further analysis would need to been undertaken for the motorway for the full planning submission.

4.8 Summary

It is anticipated that the proposed development will generate an additional 50 additional trips during the morning peak and 49 additional trips during the evening peak period. AECOM have undertaken a percentage impact assessment and it has been found that junctions 1 and 2 reach the threshold for detailed traffic modelling analysis as per the TII Guidelines.

As part of the full planning submission to WCC, detailed traffic modelling should be undertaken at the aforementioned junctions and should any of the junctions result in a capacity or queuing concerns then suitable mitigation measures should be incorporated as part of the scheme proposals.

5. Additional Assessments

5.1 Introduction

As this is an outline planning application, it is envisioned that the following assessments will be required to accompany the full planning application submission to WCC. The following additional assessments would therefore be included within the full TTA to be submitted as part of a detailed planning application.

5.2 Outline Construction Traffic Management Plan

An Outline Construction Traffic Management Plan (CTMP) would be included as a chapter within the detailed TTA. This outline CTMP will detail the possible HGV routing to the site, mitigation measures and working hours.

5.3 DMURS Statement of Compliance

A Design Manual for Urban Roads and Streets (DMURS) statement of compliance will be prepared as part of full planning submission to WCC. This statement of compliance will outline how the development conforms and complies with design principles set out in DMURS.

5.4 Outline Mobility Management Plan

An Outline Mobility Management Plan (MMP) would be included as a chapter within the detailed TTA. This outline MMP will detail possible measures that could be adopted by perspective residents and staff to increase active (walking and cycling) and sustainable modes of transport to / from the proposed development.

6. Summary and Conclusions

6.1 Overview

AECOM has been commissioned to prepare a Traffic and Transport Assessment in support of an outline planning application to Wicklow County Council for a development at a greenfield site located on the outskirts of Rathnew Co. Wicklow on the R761.

The proposed development entails 90 no. residential units (64 no. Houses and 24 no. Apartments) with a childcare facility on site of 196 sq.m. The R761 is to be upgraded as part of this scheme which comprises of widening and realignment of the existing road with a shared footpath / cycle track provided along the western side of the carriageway which links the development with the Aldi Roundabout to the south.

One vehicular access is proposed into the site from R761 which forms a staggered junction with the Wicklow County Campus.

The purpose of this TTA is to quantify the existing transport environment and to detail the results of the percentage impact assessment to identify the potential level of traffic impact generated by the proposed development and identify which junctions would need to have detailed traffic modelling analysis undertaken on.

6.2 Conclusion

Based upon the information and analysis presented within this TTA the following subsections demonstrates how the scheme has been designed from a traffic and transport perspective.

6.2.1 Vehicular Access

AECOM drawing 60659397-ACM-XX-00-DR-CE-00-0001 illustrates the proposed access arrangement. One vehicular access point is proposed to service the site. This access will feature a right turn pocket to facilitate vehicles turning into the proposed development from the R761.

6.2.2 Accessibility

The site benefits from being accessible for walking, cycling and public transport. Good quality pedestrian infrastructure facilities and street lighting are proposed which will connect the site to existing services in Rathnew Village including shops and local amenities.

6.2.3 Car Parking

It is proposed to provide 184 no. car parking spaces to serve the development. Of this total provision, 4 mobility impaired spaces will be provided and 8 no. Electric Vehicle spaces are proposed.

6.2.4 Cycle Parking

It is proposed to provide a total of 84 cycle parking spaces to serve the respective development. It is envisioned that the cycle parking will comprise of both Sheffield Stands and secure sheltered storage.

6.2.5 Servicing

An AutoTrack analysis has been undertaken to demonstrate the capability of the development to cater of a 10.2m bin lorry. The results of the analysis show that the site layout can accommodate a 10.2m long bin accessing, manoeuvring and egressing the site. This has been illustrated in AECOM drawing 60659397-ACM-XX-00-DR-CE-00-0102.

6.2.6 Trip Generation

It is envisaged that the overall development will generate a trip generation of 50 and 49 two-way vehicular movements during the morning and evening peak hours, respectively. These figures were obtained using the industry standard TRICS (Trip Rate Information Computer System).

6.2.7 Percentage Impact Analysis

From the percentage impact analysis it was evident that junction 1 and junction 2 will require further detailed traffic modelling as part of the full planning submission to Wicklow County Council. The percentage impact was also tested on the M11 Junction 16 interchange and it was found that the development was below the Transport Infrastructure Ireland thresholds that warranted further traffic analysis at this location.

As part of the full submission, as requested by Wicklow County Council, updated traffic surveys would be required and the potential impact by thee development on the road network would need to be reassessed.

6.3 Overall Conclusions

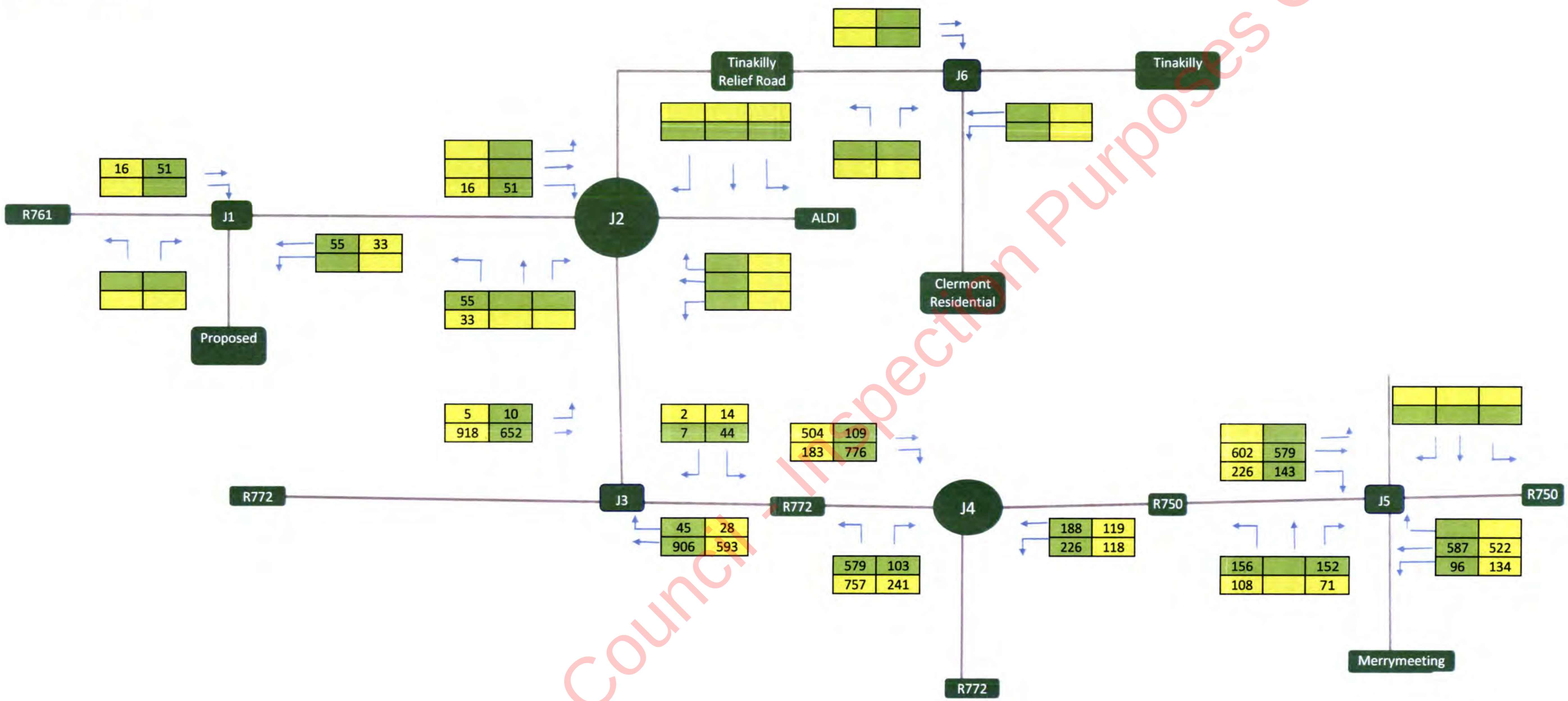
The TTA has demonstrated that the location of the development will benefit from the upgrades to the R761 which will improve pedestrian and cyclist connectivity with the existing public transport infrastructure.

The proposed roads layout and access arrangements are to be designed to comply with DMURS, TII and WCC requirements.

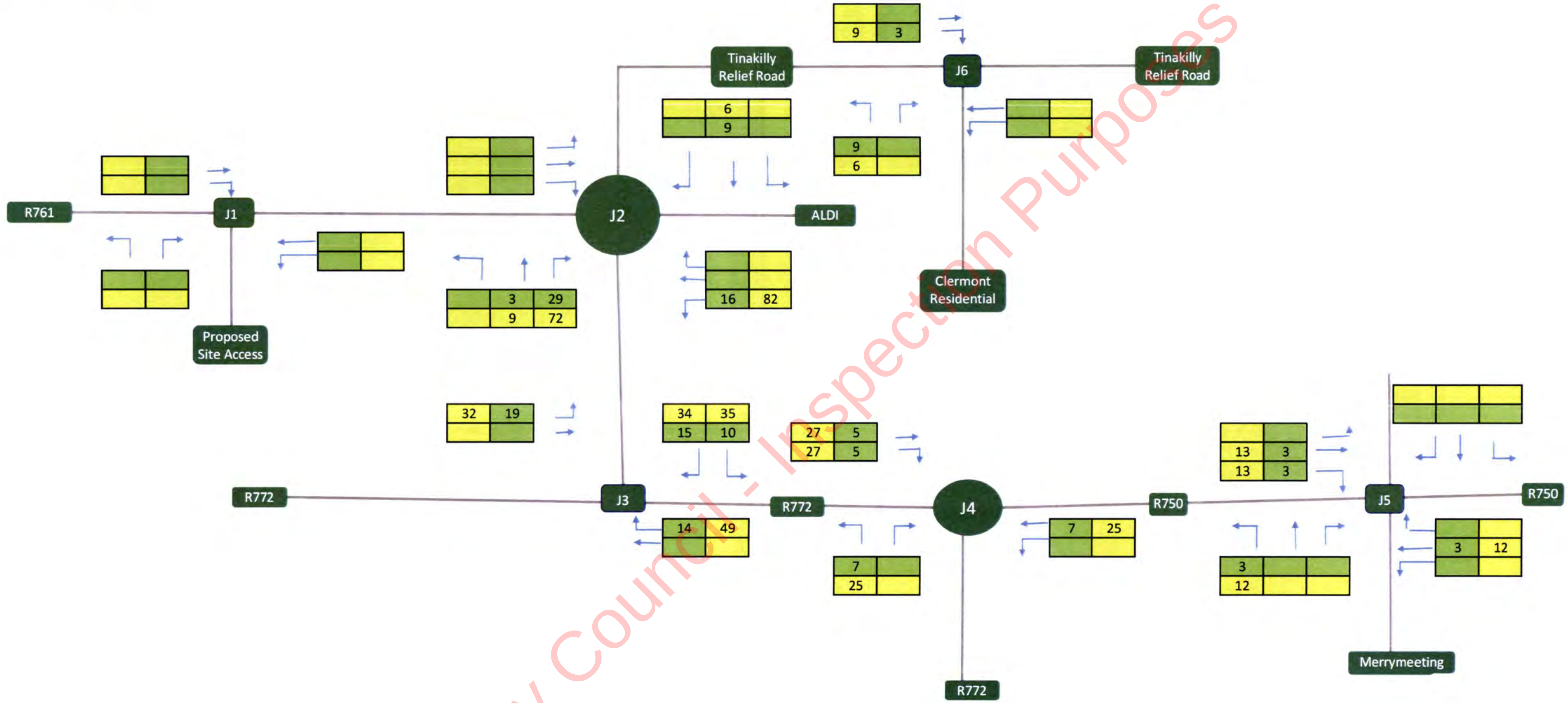
It should be noted that a detailed traffic analysis has not been undertaken as part of this outline planning submission but would be included as part of the full planning submission to Wicklow County Council along with a DMURS statement of compliance, outline CTMP and outline MMP.

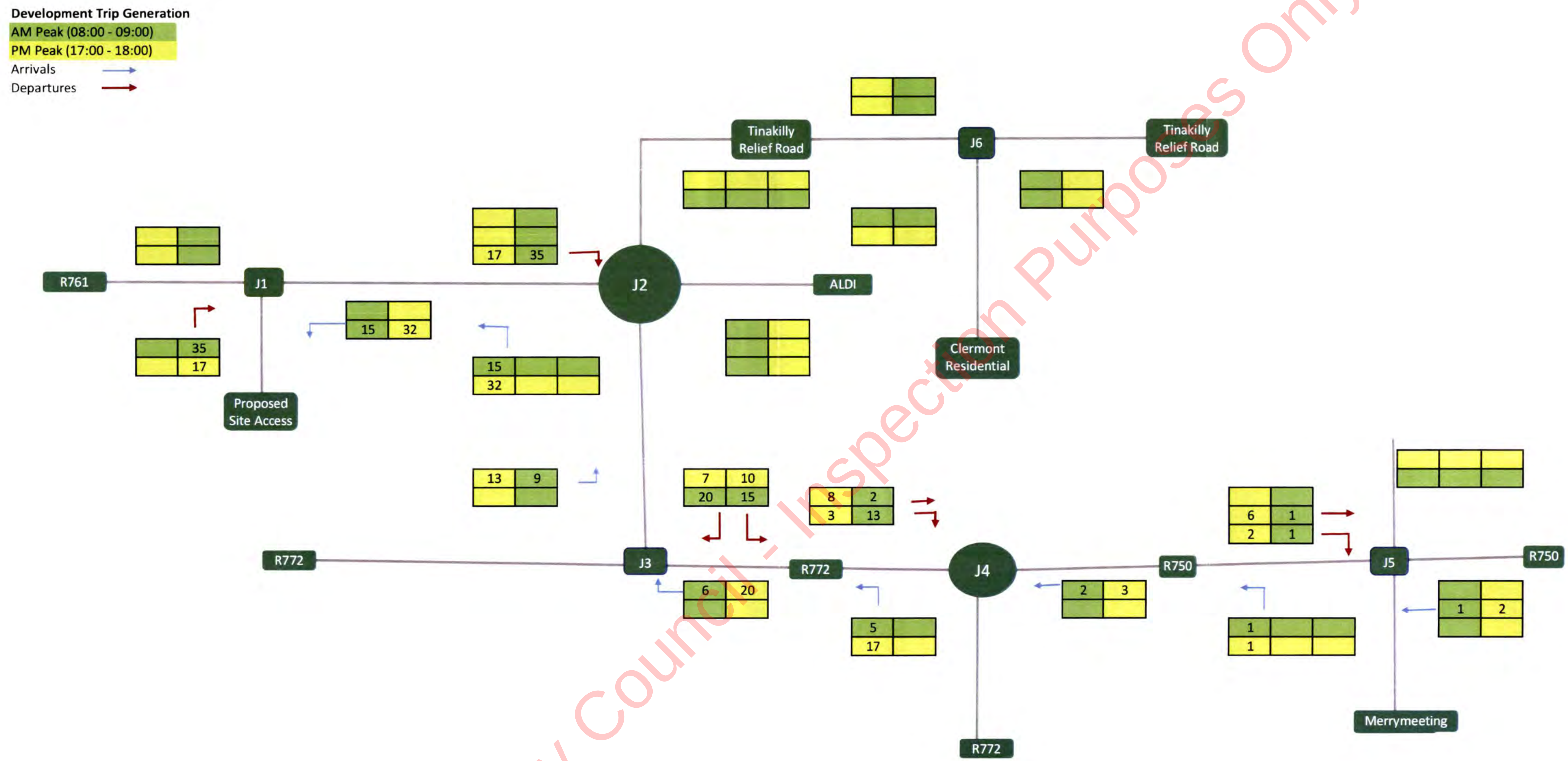
Appendix A Network Flow Diagrams

Baseline 2016
AM Peak (08:00 - 09:00)
PM Peak (17:00 - 18:00)



Committed Flows
AM Peak (08:00 - 09:00)
PM Peak (17:00 - 18:00)




Development Trip Generation
AM Peak (08:00 - 09:00)
PM Peak (17:00 - 18:00)
Arrivals
Departures
R761
J1
J2
ALDI
Tinakilly Relief Road
J6
Tinakilly Relief Road
Clermont Residential
Proposed Site Access
R772
J3
R772
J4
R750
J5
R750
Merrymeeting
R772
17 35
35 17
15 32
15 32
13 9
7 10 20 15
8 2 3 13
6 20
5 17
2 3
6 1 2 1
1 1
1 2

Appendix B TRICS Outputs

Calculation Reference: AUDIT-204602-210723-0754

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
Category : C - FLATS PRIVATELY OWNED
MULTI-MODAL TOTAL VEHICLES

Selected regions and areas:

02	**SOUTH EAST**		
	BD	BEDFORDSHIRE	2 days
	EX	ESSEX	2 days
07	**YORKSHIRE & NORTH LINCOLNSHIRE**		
	RI	EAST RIDING OF YORKSHIRE	1 days
11	**SCOTLAND**		
	SA	SOUTH AYRSHIRE	1 days
	SR	STIRLING	1 days
14	**LEINSTER**		
	LU	LOUTH	3 days
17	**ULSTER (NORTHERN IRELAND)**		
	AN	ANTRIM	1 days

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

Primary Filtering selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: No of Dwellings
Actual Range: 6 to 175 (units:)
Range Selected by User: 6 to 372 (units:)

Parking Spaces Range: All Surveys Included

Parking Spaces per Dwelling Range: All Surveys Included

Bedrooms per Dwelling Range: All Surveys Included

Percentage of dwellings privately owned: All Surveys Included

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/13 to 18/11/19

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Monday	2 days
Tuesday	6 days
Wednesday	1 days
Thursday	1 days
Friday	1 days

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

Selected survey types:

Manual count	11 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaking using machines.

Selected Locations:

Edge of Town Centre	9
Edge of Town	2

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Residential Zone	11

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Secondary Filtering selection:

Use Class:

C3	11 days

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

Population within 500m Range:
All Surveys Included

Population within 1 mile:

5,001 to 10,000	2 days
10,001 to 15,000	2 days
15,001 to 20,000	2 days
25,001 to 50,000	5 days

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

Population within 5 miles:

25,001 to 50,000	3 days
50,001 to 75,000	4 days
75,001 to 100,000	1 days
125,001 to 250,000	3 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.6 to 1.0	2 days
1.1 to 1.5	9 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:

No	11 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

PTAL Rating:

No PTAL Present	11 days

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

LIST OF SITES relevant to selection parameters

1	**AN-03-C-02**	**BLOCK OF FLATS**		**ANTRIM**
	SUMMERHILL AVENUE			
	BELFAST			
	KNOCK			
	Edge of Town			
	Residential Zone			
	Total No of Dwellings:		22	
	Survey date: FRIDAY		*28/11/14*	*Survey Type: MANUAL*
2	**BD-03-C-01**	**BLOCKS OF FLATS**		**BEDFORDSHIRE**
	WING ROAD			
	LEIGHTON BUZZARD			
	LINSLADE			
	Edge of Town Centre			
	Residential Zone			
	Total No of Dwellings:		175	
	Survey date: TUESDAY		*15/05/18*	*Survey Type: MANUAL*
3	**BD-03-C-02**	**BLOCKS OF FLATS**		**BEDFORDSHIRE**
	STANBRIDGE ROAD			
	LEIGHTON BUZZARD			
	Edge of Town Centre			
	Residential Zone			
	Total No of Dwellings:		62	
	Survey date: TUESDAY		*15/05/18*	*Survey Type: MANUAL*
4	**EX-03-C-01**	**FLATS**		**ESSEX**
	WESTCLIFF PARADE			
	SOUTHEND-ON-SEA			
	WESTCLIFF			
	Edge of Town Centre			
	Residential Zone			
	Total No of Dwellings:		6	
	Survey date: TUESDAY		*22/10/13*	*Survey Type: MANUAL*
5	**EX-03-C-02**	**BLOCK OF FLATS**		**ESSEX**
	WESTCLIFF PARADE			
	SOUTHEND-ON-SEA			
	WESTCLIFF			
	Edge of Town Centre			
	Residential Zone			
	Total No of Dwellings:		94	
	Survey date: TUESDAY		*22/10/13*	*Survey Type: MANUAL*
6	**LU-03-C-01**	**BLOCKS OF FLATS**		**LOUTH**
	DONORE ROAD			
	DROGHEDA			
	Edge of Town Centre			
	Residential Zone			
	Total No of Dwellings:		52	
	Survey date: THURSDAY		*12/09/13*	*Survey Type: MANUAL*
7	**LU-03-C-02**	**BLOCK OF FLATS**		**LOUTH**
	NICHOLAS STREET			
	DUNDALK			
	Edge of Town Centre			
	Residential Zone			
	Total No of Dwellings:		33	
	Survey date: MONDAY		*16/09/13*	*Survey Type: MANUAL*
8	**LU-03-C-03**	**BLOCK OF FLATS**		**LOUTH**
	NICHOLAS STREET			
	DUNDALK			
	Edge of Town Centre			
	Residential Zone			
	Total No of Dwellings:		20	
	Survey date: MONDAY		*16/09/13*	*Survey Type: MANUAL*

LIST OF SITES relevant to selection parameters (Cont.)

9	**RI-03-C-01**	**FLATS**		**EAST RIDING OF YORKSHIRE**
	465 PRIORY ROAD HULL			
	Edge of Town Residential Zone Total No of Dwellings:		20	
	Survey date: TUESDAY		*13/05/14*	*Survey Type: MANUAL*
10	**SA-03-C-01**	**BLOCK OF FLATS**		**SOUTH AYRSHIRE**
	RACECOURSE ROAD AYR			
	Edge of Town Centre Residential Zone Total No of Dwellings:		51	
	Survey date: TUESDAY		*16/09/14*	*Survey Type: MANUAL*
11	**SR-03-C-02**	**FLATS**		**STIRLING**
	ROSEBERRY TERRACE STIRLING			
	Edge of Town Centre Residential Zone Total No of Dwellings:		48	
	Survey date: WEDNESDAY		*18/06/14*	*Survey Type: MANUAL*

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

TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED

MULTI-MODAL TOTAL VEHICLES

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	11	53	0.039	11	53	0.148	11	53	0.187
08:00 - 09:00	11	53	0.058	**11**	**53**	**0.177**	11	53	0.235
09:00 - 10:00	11	53	0.070	11	53	0.093	11	53	0.163
10:00 - 11:00	11	53	0.084	11	53	0.106	11	53	0.190
11:00 - 12:00	11	53	0.069	11	53	0.094	11	53	0.163
12:00 - 13:00	11	53	0.113	11	53	0.089	11	53	0.202
13:00 - 14:00	11	53	0.099	11	53	0.096	11	53	0.195
14:00 - 15:00	11	53	0.079	11	53	0.081	11	53	0.160
15:00 - 16:00	11	53	0.084	11	53	0.079	11	53	0.163
16:00 - 17:00	11	53	0.120	11	53	0.086	11	53	0.206
17:00 - 18:00	11	53	0.177	11	53	0.084	11	53	0.261
18:00 - 19:00	**11**	**53**	**0.178**	11	53	0.099	**11**	**53**	**0.277**
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.170			1.232			2.402

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

Parameter summary

Trip rate parameter range selected:	6 - 175 (units:)
Survey date date range:	01/01/13 - 18/11/19
Number of weekdays (Monday-Friday):	11
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED
MULTI-MODAL TAXIS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	11	53	0.003	**11**	**53**	**0.005**	11	53	0.008
08:00 - 09:00	11	53	0.000	11	53	0.000	11	53	0.000
09:00 - 10:00	11	53	0.002	11	53	0.002	11	53	0.004
10:00 - 11:00	11	53	0.002	11	53	0.002	11	53	0.004
11:00 - 12:00	11	53	0.003	11	53	0.003	11	53	0.006
12:00 - 13:00	11	53	0.003	11	53	0.003	11	53	0.006
13:00 - 14:00	**11**	**53**	**0.005**	11	53	0.005	**11**	**53**	**0.010**
14:00 - 15:00	11	53	0.002	11	53	0.002	11	53	0.004
15:00 - 16:00	11	53	0.002	11	53	0.002	11	53	0.004
16:00 - 17:00	11	53	0.005	11	53	0.005	11	53	0.010
17:00 - 18:00	11	53	0.005	11	53	0.005	11	53	0.010
18:00 - 19:00	11	53	0.000	11	53	0.000	11	53	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.032			0.034			0.066

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED
MULTI-MODAL OGVS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	11	53	0.000	11	53	0.000	11	53	0.000
08:00 - 09:00	11	53	0.000	11	53	0.000	11	53	0.000
09:00 - 10:00	**11**	**53**	**0.003**	**11**	**53**	**0.002**	**11**	**53**	**0.005**
10:00 - 11:00	11	53	0.000	11	53	0.002	11	53	0.002
11:00 - 12:00	11	53	0.000	11	53	0.000	11	53	0.000
12:00 - 13:00	11	53	0.000	11	53	0.000	11	53	0.000
13:00 - 14:00	11	53	0.000	11	53	0.000	11	53	0.000
14:00 - 15:00	11	53	0.000	11	53	0.000	11	53	0.000
15:00 - 16:00	11	53	0.002	11	53	0.000	11	53	0.002
16:00 - 17:00	11	53	0.000	11	53	0.002	11	53	0.002
17:00 - 18:00	11	53	0.000	11	53	0.000	11	53	0.000
18:00 - 19:00	11	53	0.000	11	53	0.000	11	53	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.005			0.006			0.011

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED
MULTI-MODAL PSVS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	11	53	0.000	11	53	0.000	11	53	0.000
08:00 - 09:00	11	53	0.000	11	53	0.000	11	53	0.000
09:00 - 10:00	11	53	0.000	11	53	0.000	11	53	0.000
10:00 - 11:00	**11**	**53**	**0.002**	**11**	**53**	**0.002**	**11**	**53**	**0.004**
11:00 - 12:00	11	53	0.000	11	53	0.000	11	53	0.000
12:00 - 13:00	11	53	0.000	11	53	0.000	11	53	0.000
13:00 - 14:00	11	53	0.000	11	53	0.000	11	53	0.000
14:00 - 15:00	11	53	0.000	11	53	0.000	11	53	0.000
15:00 - 16:00	11	53	0.002	11	53	0.000	11	53	0.002
16:00 - 17:00	11	53	0.000	11	53	0.002	11	53	0.002
17:00 - 18:00	11	53	0.000	11	53	0.000	11	53	0.000
18:00 - 19:00	11	53	0.000	11	53	0.000	11	53	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.004			0.004			0.008

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED

MULTI-MODAL CYCLISTS

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	11	53	0.003	11	53	0.007	11	53	0.010
08:00 - 09:00	**11**	**53**	**0.007**	**11**	**53**	**0.012**	**11**	**53**	**0.019**
09:00 - 10:00	11	53	0.000	11	53	0.000	11	53	0.000
10:00 - 11:00	11	53	0.002	11	53	0.003	11	53	0.005
11:00 - 12:00	11	53	0.003	11	53	0.003	11	53	0.006
12:00 - 13:00	11	53	0.002	11	53	0.003	11	53	0.005
13:00 - 14:00	11	53	0.000	11	53	0.000	11	53	0.000
14:00 - 15:00	11	53	0.002	11	53	0.000	11	53	0.002
15:00 - 16:00	11	53	0.000	11	53	0.002	11	53	0.002
16:00 - 17:00	11	53	0.003	11	53	0.000	11	53	0.003
17:00 - 18:00	11	53	0.007	11	53	0.002	11	53	0.009
18:00 - 19:00	11	53	0.003	11	53	0.000	11	53	0.003
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.032			0.032			0.064

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED
MULTI-MODAL VEHICLE OCCUPANTS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	11	53	0.041	11	53	0.221	11	53	0.262
08:00 - 09:00	11	53	0.069	**11**	**53**	**0.297**	11	53	0.366
09:00 - 10:00	11	53	0.103	11	53	0.129	11	53	0.232
10:00 - 11:00	11	53	0.117	11	53	0.141	11	53	0.258
11:00 - 12:00	11	53	0.084	11	53	0.134	11	53	0.218
12:00 - 13:00	11	53	0.144	11	53	0.137	11	53	0.281
13:00 - 14:00	11	53	0.130	11	53	0.123	11	53	0.253
14:00 - 15:00	11	53	0.110	11	53	0.105	11	53	0.215
15:00 - 16:00	11	53	0.127	11	53	0.115	11	53	0.242
16:00 - 17:00	11	53	0.192	11	53	0.111	11	53	0.303
17:00 - 18:00	11	53	0.293	11	53	0.110	11	53	0.403
18:00 - 19:00	**11**	**53**	**0.316**	11	53	0.136	**11**	**53**	**0.452**
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.726			1.759			3.485

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED

MULTI-MODAL PEDESTRIANS

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	11	53	0.012	11	53	0.043	11	53	0.055
08:00 - 09:00	11	53	0.012	**11**	**53**	**0.089**	11	53	0.101
09:00 - 10:00	11	53	0.057	11	53	0.050	**11**	**53**	**0.107**
10:00 - 11:00	11	53	0.038	11	53	0.029	11	53	0.067
11:00 - 12:00	11	53	0.029	11	53	0.048	11	53	0.077
12:00 - 13:00	11	53	0.038	11	53	0.036	11	53	0.074
13:00 - 14:00	11	53	0.034	11	53	0.031	11	53	0.065
14:00 - 15:00	11	53	0.043	11	53	0.029	11	53	0.072
15:00 - 16:00	11	53	0.060	11	53	0.036	11	53	0.096
16:00 - 17:00	11	53	0.026	11	53	0.038	11	53	0.064
17:00 - 18:00	**11**	**53**	**0.062**	11	53	0.045	11	53	0.107
18:00 - 19:00	11	53	0.048	11	53	0.053	11	53	0.101
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.459			0.527			0.986

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED

MULTI-MODAL BUS/TRAM PASSENGERS

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	11	53	0.003	11	53	0.031	11	53	0.034
08:00 - 09:00	11	53	0.007	**11**	**53**	**0.062**	**11**	**53**	**0.069**
09:00 - 10:00	11	53	0.005	11	53	0.027	11	53	0.032
10:00 - 11:00	11	53	0.007	11	53	0.014	11	53	0.021
11:00 - 12:00	11	53	0.003	11	53	0.007	11	53	0.010
12:00 - 13:00	11	53	0.012	11	53	0.019	11	53	0.031
13:00 - 14:00	11	53	0.007	11	53	0.014	11	53	0.021
14:00 - 15:00	11	53	0.009	11	53	0.003	11	53	0.012
15:00 - 16:00	**11**	**53**	**0.055**	11	53	0.007	11	53	0.062
16:00 - 17:00	11	53	0.015	11	53	0.009	11	53	0.024
17:00 - 18:00	11	53	0.038	11	53	0.010	11	53	0.048
18:00 - 19:00	11	53	0.048	11	53	0.010	11	53	0.058
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.209			0.213			0.422

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED
MULTI-MODAL TOTAL RAIL PASSENGERS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	11	53	0.000	**11**	**53**	**0.017**	**11**	**53**	**0.017**
08:00 - 09:00	11	53	0.000	11	53	0.017	11	53	0.017
09:00 - 10:00	11	53	0.000	11	53	0.005	11	53	0.005
10:00 - 11:00	11	53	0.005	11	53	0.002	11	53	0.007
11:00 - 12:00	11	53	0.000	11	53	0.000	11	53	0.000
12:00 - 13:00	11	53	0.003	11	53	0.002	11	53	0.005
13:00 - 14:00	11	53	0.002	11	53	0.002	11	53	0.004
14:00 - 15:00	11	53	0.002	11	53	0.000	11	53	0.002
15:00 - 16:00	11	53	0.003	11	53	0.000	11	53	0.003
16:00 - 17:00	11	53	0.007	11	53	0.000	11	53	0.007
17:00 - 18:00	**11**	**53**	**0.015**	11	53	0.000	11	53	0.015
18:00 - 19:00	11	53	0.010	11	53	0.000	11	53	0.010
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			**0.047**			**0.045**			**0.092**

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED
MULTI-MODAL COACH PASSENGERS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	11	53	0.000	11	53	0.000	11	53	0.000
08:00 - 09:00	11	53	0.000	11	53	0.000	11	53	0.000
09:00 - 10:00	11	53	0.000	11	53	0.000	11	53	0.000
10:00 - 11:00	11	53	0.000	**11**	**53**	**0.003**	**11**	**53**	**0.003**
11:00 - 12:00	11	53	0.000	11	53	0.000	11	53	0.000
12:00 - 13:00	11	53	0.000	11	53	0.000	11	53	0.000
13:00 - 14:00	11	53	0.000	11	53	0.000	11	53	0.000
14:00 - 15:00	11	53	0.000	11	53	0.000	11	53	0.000
15:00 - 16:00	**11**	**53**	**0.002**	11	53	0.000	11	53	0.002
16:00 - 17:00	11	53	0.000	11	53	0.000	11	53	0.000
17:00 - 18:00	11	53	0.000	11	53	0.000	11	53	0.000
18:00 - 19:00	11	53	0.000	11	53	0.000	11	53	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.002			0.003			0.005

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED

MULTI-MODAL PUBLIC TRANSPORT USERS

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	11	53	0.003	11	53	0.048	11	53	0.051
08:00 - 09:00	11	53	0.007	**11**	**53**	**0.079**	**11**	**53**	**0.086**
09:00 - 10:00	11	53	0.005	11	53	0.033	11	53	0.038
10:00 - 11:00	11	53	0.012	11	53	0.019	11	53	0.031
11:00 - 12:00	11	53	0.003	11	53	0.007	11	53	0.010
12:00 - 13:00	11	53	0.015	11	53	0.021	11	53	0.036
13:00 - 14:00	11	53	0.009	11	53	0.015	11	53	0.024
14:00 - 15:00	11	53	0.010	11	53	0.003	11	53	0.013
15:00 - 16:00	**11**	**53**	**0.060**	11	53	0.007	11	53	0.067
16:00 - 17:00	11	53	0.022	11	53	0.009	11	53	0.031
17:00 - 18:00	11	53	0.053	11	53	0.010	11	53	0.063
18:00 - 19:00	11	53	0.058	11	53	0.010	11	53	0.068
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.257			0.261			0.518

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED

MULTI-MODAL TOTAL PEOPLE

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	11	53	0.060	11	53	0.319	11	53	0.379
08:00 - 09:00	11	53	0.094	**11**	**53**	**0.477**	11	53	0.571
09:00 - 10:00	11	53	0.165	11	53	0.211	11	53	0.376
10:00 - 11:00	11	53	0.168	11	53	0.192	11	53	0.360
11:00 - 12:00	11	53	0.120	11	53	0.192	11	53	0.312
12:00 - 13:00	11	53	0.199	11	53	0.197	11	53	0.396
13:00 - 14:00	11	53	0.173	11	53	0.170	11	53	0.343
14:00 - 15:00	11	53	0.165	11	53	0.137	11	53	0.302
15:00 - 16:00	11	53	0.247	11	53	0.160	11	53	0.407
16:00 - 17:00	11	53	0.244	11	53	0.158	11	53	0.402
17:00 - 18:00	11	53	0.415	11	53	0.166	11	53	0.581
18:00 - 19:00	**11**	**53**	**0.425**	11	53	0.199	**11**	**53**	**0.624**
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			2.475			2.578			5.053

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED
MULTI-MODAL CARS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	11	53	0.026	11	53	0.111	11	53	0.137
08:00 - 09:00	11	53	0.027	**11**	**53**	**0.122**	11	53	0.149
09:00 - 10:00	11	53	0.026	11	53	0.043	11	53	0.069
10:00 - 11:00	11	53	0.048	11	53	0.048	11	53	0.096
11:00 - 12:00	11	53	0.029	11	53	0.050	11	53	0.079
12:00 - 13:00	11	53	0.062	11	53	0.038	11	53	0.100
13:00 - 14:00	11	53	0.034	11	53	0.043	11	53	0.077
14:00 - 15:00	11	53	0.034	11	53	0.038	11	53	0.072
15:00 - 16:00	11	53	0.046	11	53	0.041	11	53	0.087
16:00 - 17:00	11	53	0.075	11	53	0.045	11	53	0.120
17:00 - 18:00	11	53	0.110	11	53	0.046	11	53	0.156
18:00 - 19:00	**11**	**53**	**0.142**	11	53	0.079	**11**	**53**	**0.221**
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.659			0.704			1.363

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED

MULTI-MODAL LGVS

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	11	53	0.000	11	53	0.009	11	53	0.009
08:00 - 09:00	11	53	0.009	11	53	0.009	11	53	0.018
09:00 - 10:00	11	53	0.007	11	53	0.007	11	53	0.014
10:00 - 11:00	11	53	0.005	11	53	0.007	11	53	0.012
11:00 - 12:00	11	53	0.010	**11**	**53**	**0.014**	**11**	**53**	**0.024**
12:00 - 13:00	**11**	**53**	**0.014**	11	53	0.010	11	53	0.024
13:00 - 14:00	11	53	0.005	11	53	0.007	11	53	0.012
14:00 - 15.00	11	53	0.007	11	53	0.007	11	53	0.014
15:00 - 16:00	11	53	0.005	11	53	0.009	11	53	0.014
16:00 - 17:00	11	53	0.009	11	53	0.007	11	53	0.016
17:00 - 18:00	11	53	0.010	11	53	0.002	11	53	0.012
18:00 - 19:00	11	53	0.003	11	53	0.002	11	53	0.005
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.084			0.090			0.174

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

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TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED

MULTI-MODAL MOTOR CYCLES

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	11	53	0.000	11	53	0.000	11	53	0.000
08:00 - 09:00	11	53	0.000	11	53	0.000	11	53	0.000
09:00 - 10:00	11	53	0.000	11	53	0.000	11	53	0.000
10:00 - 11:00	11	53	0.000	11	53	0.000	11	53	0.000
11:00 - 12:00	11	53	0.000	11	53	0.000	11	53	0.000
12:00 - 13:00	**11**	**53**	**0.002**	**11**	**53**	**0.002**	**11**	**53**	**0.004**
13:00 - 14:00	11	53	0.000	11	53	0.002	11	53	0.002
14:00 - 15:00	11	53	0.000	11	53	0.000	11	53	0.000
15:00 - 16:00	11	53	0.000	11	53	0.000	11	53	0.000
16:00 - 17:00	11	53	0.000	11	53	0.000	11	53	0.000
17:00 - 18:00	11	53	0.000	11	53	0.000	11	53	0.000
18:00 - 19:00	11	53	0.002	11	53	0.002	11	53	0.004
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			**0.004**			**0.006**			**0.010**

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

Calculation Reference: AUDIT-204602-210726-0751

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
Category : A - HOUSES PRIVATELY OWNED
MULTI-MODAL TOTAL VEHICLES

Selected regions and areas:

02	**SOUTH EAST**		
	ES	EAST SUSSEX	1 days
	HF	HERTFORDSHIRE	1 days
	KC	KENT	1 days
	SC	SURREY	1 days
	WS	WEST SUSSEX	3 days
03	**SOUTH WEST**		
	SM	SOMERSET	1 days
04	**EAST ANGLIA**		
	NF	NORFOLK	4 days
	SF	SUFFOLK	1 days
06	**WEST MIDLANDS**		
	SH	SHROPSHIRE	2 days
	ST	STAFFORDSHIRE	1 days
07	**YORKSHIRE & NORTH LINCOLNSHIRE**		
	NY	NORTH YORKSHIRE	1 days
08	**NORTH WEST**		
	CH	CHESHIRE	2 days
09	**NORTH**		
	DH	DURHAM	1 days
13	**MUNSTER**		
	WA	WATERFORD	1 days
15	**GREATER DUBLIN**		
	DL	DUBLIN	1 days
16	**ULSTER (REPUBLIC OF IRELAND)**		
	DN	DONEGAL	3 days
17	**ULSTER (NORTHERN IRELAND)**		
	DO	DOWN	1 days

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

Primary Filtering selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter:	No of Dwellings
Actual Range:	6 to 918 (units:)
Range Selected by User:	4 to 1817 (units:)

Parking Spaces Range: All Surveys Included

Parking Spaces per Dwelling Range: All Surveys Included

Bedrooms per Dwelling Range: All Surveys Included

Percentage of dwellings privately owned: All Surveys Included

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/13 to 08/10/20

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Monday	5 days
Tuesday	3 days
Wednesday	10 days
Thursday	6 days
Friday	2 days

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

Selected survey types:

Manual count	26 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaking using machines.

Selected Locations:

Edge of Town	25
Neighbourhood Centre (PPS6 Local Centre)	1

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Residential Zone	26

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Secondary Filtering selection:

Use Class:

C3	26 days

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

Population within 500m Range:
All Surveys Included

Secondary Filtering selection (Cont.):

Population within 1 mile:

1,000 or Less	1 days
1,001 to 5,000	5 days
5,001 to 10,000	7 days
10,001 to 15,000	11 days
15,001 to 20,000	1 days
20,001 to 25,000	1 days

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

Population within 5 miles:

5,000 or Less	1 days
5,001 to 25,000	7 days
25,001 to 50,000	4 days
50,001 to 75,000	5 days
75,001 to 100,000	8 days
100,001 to 125,000	1 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.6 to 1.0	4 days
1.1 to 1.5	21 days
1.6 to 2.0	1 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:

Yes	8 days
No	18 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

PTAL Rating:

No PTAL Present	26 days

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

LIST OF SITES relevant to selection parameters

1 **CH-03-A-09** **TERRACED HOUSES** **CHESHIRE**
GREYSTOKE ROAD
MACCLESFIELD
HURDSFIELD
Edge of Town
Residential Zone
Total No of Dwellings: 24
Survey date: MONDAY *24/11/14* *Survey Type: MANUAL*

2 **CH-03-A-10** **SEMI-DETACHED & TERRACED** **CHESHIRE**
MEADOW DRIVE
NORTHWICH
BARNTON
Edge of Town
Residential Zone
Total No of Dwellings: 40
Survey date: TUESDAY *04/06/19* *Survey Type: MANUAL*

3 **DH-03-A-02** **MIXED HOUSES** **DURHAM**
LEAZES LANE
BISHOP AUCKLAND
ST HELEN AUCKLAND
Neighbourhood Centre (PPS6 Local Centre)
Residential Zone
Total No of Dwellings: 125
Survey date: MONDAY *27/03/17* *Survey Type: MANUAL*

4 **DL-03-A-10** **SEMI DETACHED & DETACHED** **DUBLIN**
R124
MALAHIDE
SAINT HELENS
Edge of Town
Residential Zone
Total No of Dwellings: 65
Survey date: WEDNESDAY *20/06/18* *Survey Type: MANUAL*

5 **DN-03-A-03** **DETACHED/SEMI-DETACHED** **DONEGAL**
THE GRANGE
LETTERKENNY
GLENCAR IRISH
Edge of Town
Residential Zone
Total No of Dwellings: 50
Survey date: MONDAY *01/09/14* *Survey Type: MANUAL*

6 **DN-03-A-04** **SEMI-DETACHED** **DONEGAL**
GORTLEE ROAD
LETTERKENNY
GORTLEE
Edge of Town
Residential Zone
Total No of Dwellings: 83
Survey date: FRIDAY *26/09/14* *Survey Type: MANUAL*

7 **DN-03-A-06** **DETACHED HOUSING** **DONEGAL**
GLENFIN ROAD
BALLYBOFEY

Edge of Town
Residential Zone
Total No of Dwellings: 6
Survey date: WEDNESDAY *10/10/18* *Survey Type: MANUAL*

8 **DO-03-A-03** **DETACHED/SEMI DETACHED** **DOWN**
OLD MILL HEIGHTS
BELFAST
DUNDONALD
Edge of Town
Residential Zone
Total No of Dwellings: 79
Survey date: WEDNESDAY *23/10/13* *Survey Type: MANUAL*

LIST OF SITES relevant to selection parameters (Cont.)

9 **ES-03-A-04** **MIXED HOUSES & FLATS** **EAST SUSSEX**
NEW LYDD ROAD
CAMBER

Edge of Town
Residential Zone
Total No of Dwellings: 134
Survey date: FRIDAY *15/07/16* *Survey Type: MANUAL*

10 **HF-03-A-03** **MIXED HOUSES** **HERTFORDSHIRE**
HARE STREET ROAD
BUNTINGFORD

Edge of Town
Residential Zone
Total No of Dwellings: 160
Survey date: MONDAY *08/07/19* *Survey Type: MANUAL*

11 **KC-03-A-07** **MIXED HOUSES** **KENT**
RECULVER ROAD
HERNE BAY

Edge of Town
Residential Zone
Total No of Dwellings: 288
Survey date: WEDNESDAY *27/09/17* *Survey Type: MANUAL*

12 **NF-03-A-03** **DETACHED HOUSES** **NORFOLK**
HALING WAY
THETFORD

Edge of Town
Residential Zone
Total No of Dwellings: 10
Survey date: WEDNESDAY *16/09/15* *Survey Type: MANUAL*

13 **NF-03-A-04** **MIXED HOUSES** **NORFOLK**
NORTH WALSHAM ROAD
NORTH WALSHAM

Edge of Town
Residential Zone
Total No of Dwellings: 70
Survey date: WEDNESDAY *18/09/19* *Survey Type: MANUAL*

14 **NF-03-A-05** **MIXED HOUSES** **NORFOLK**
HEATH DRIVE
HOLT

Edge of Town
Residential Zone
Total No of Dwellings: 40
Survey date: THURSDAY *19/09/19* *Survey Type: MANUAL*

15 **NF-03-A-06** **MIXED HOUSES** **NORFOLK**
BEAUFORT WAY
GREAT YARMOUTH
BRADWELL
Edge of Town
Residential Zone
Total No of Dwellings: 275
Survey date: MONDAY *23/09/19* *Survey Type: MANUAL*

16 **NY-03-A-11** **PRIVATE HOUSING** **NORTH YORKSHIRE**
HORSEFAIR
BOROUGHBRIDGE

Edge of Town
Residential Zone
Total No of Dwellings: 23
Survey date: WEDNESDAY *18/09/13* *Survey Type: MANUAL*

LIST OF SITES relevant to selection parameters (Cont.)

17 **SC-03-A-04** **DETACHED & TERRACED** **SURREY**
HIGH ROAD
BYFLEET

Edge of Town
Residential Zone
Total No of Dwellings: 71
Survey date: THURSDAY *23/01/14* *Survey Type: MANUAL*

18 **SF-03-A-05** **DETACHED HOUSES** **SUFFOLK**
VALE LANE
BURY ST EDMUNDS

Edge of Town
Residential Zone
Total No of Dwellings: 18
Survey date: WEDNESDAY *09/09/15* *Survey Type: MANUAL*

19 **SH-03-A-05** **SEMI-DETACHED/TERRACED** **SHROPSHIRE**
SANDCROFT
TELFORD
SUTTON HILL
Edge of Town
Residential Zone
Total No of Dwellings: 54
Survey date: THURSDAY *24/10/13* *Survey Type: MANUAL*

20 **SH-03-A-06** **BUNGALOWS** **SHROPSHIRE**
ELLESMERE ROAD
SHREWSBURY

Edge of Town
Residential Zone
Total No of Dwellings: 16
Survey date: THURSDAY *22/05/14* *Survey Type: MANUAL*

21 **SM-03-A-01** **DETACHED & SEMI** **SOMERSET**
WEMBDON ROAD
BRIDGWATER
NORTHFIELD
Edge of Town
Residential Zone
Total No of Dwellings: 33
Survey date: THURSDAY *24/09/15* *Survey Type: MANUAL*

22 **ST-03-A-07** **DETACHED & SEMI-DETACHED** **STAFFORDSHIRE**
BEACONSIDE
STAFFORD
MARSTON GATE
Edge of Town
Residential Zone
Total No of Dwellings: 248
Survey date: WEDNESDAY *22/11/17* *Survey Type: MANUAL*

23 **WA-03-A-04** **DETACHED** **WATERFORD**
MAYPARK LANE
WATERFORD

Edge of Town
Residential Zone
Total No of Dwellings: 280
Survey date: TUESDAY *24/06/14* *Survey Type: MANUAL*

24 **WS-03-A-04** **MIXED HOUSES** **WEST SUSSEX**
HILLS FARM LANE
HORSHAM
BROADBRIDGE HEATH
Edge of Town
Residential Zone
Total No of Dwellings. 151
Survey date: THURSDAY *11/12/14* *Survey Type: MANUAL*

LIST OF SITES relevant to selection parameters (Cont.)

25 **WS-03-A-10** **MIXED HOUSES** **WEST SUSSEX**
TODDINGTON LANE
LITTLEHAMPTON
WICK
Edge of Town
Residential Zone
Total No of Dwellings: 79
Survey date: WEDNESDAY *07/11/18* *Survey Type: MANUAL*

26 **WS-03-A-11** **MIXED HOUSES** **WEST SUSSEX**
ELLIS ROAD
WEST HORSHAM
S BROADBRIDGE HEATH
Edge of Town
Residential Zone
Total No of Dwellings: 918
Survey date: TUESDAY *02/04/19* *Survey Type: MANUAL*

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

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
MULTI-MODAL TOTAL VEHICLES
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	26	128	0.074	26	128	0.287	26	128	0.361
08:00 - 09:00	26	128	0.144	**26**	**128**	**0.407**	**26**	**128**	**0.551**
09:00 - 10:00	26	128	0.150	26	128	0.178	26	128	0.328
10:00 - 11:00	26	128	0.120	26	128	0.148	26	128	0.268
11:00 - 12:00	26	128	0.128	26	128	0.161	26	128	0.289
12:00 - 13:00	26	128	0 168	26	128	0.154	26	128	0.322
13:00 - 14:00	26	128	0.166	26	128	0.162	26	128	0.328
14:00 - 15:00	26	128	0.185	26	128	0.199	26	128	0.384
15:00 - 16:00	26	128	0.289	26	128	0.183	26	128	0.472
16:00 - 17:00	26	128	0.290	26	128	0.174	26	128	0.464
17:00 - 18:00	**26**	**128**	**0.370**	26	128	0.166	26	128	0.536
18:00 - 19:00	26	128	0.298	26	128	0.183	26	128	0.481
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			2.382			2.402			4.784

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

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Parameter summary

Trip rate parameter range selected:	6 - 918 (units:)
Survey date date range:	01/01/13 - 08/10/20
Number of weekdays (Monday-Friday):	26
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	2
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED

MULTI-MODAL VEHICLE OCCUPANTS

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	26	128	0.089	26	128	0.424	26	128	0.513
08:00 - 09:00	26	128	0.182	**26**	**128**	**0.697**	**26**	**128**	**0.879**
09:00 - 10:00	26	128	0.189	26	128	0.255	26	128	0.444
10:00 - 11:00	26	128	0.153	26	128	0.213	26	128	0.366
11:00 - 12:00	26	128	0.173	26	128	0.222	26	128	0.395
12:00 - 13:00	26	128	0.227	26	128	0.209	26	128	0.436
13:00 - 14:00	26	128	0 235	26	128	0.224	26	128	0.459
14:00 - 15:00	26	128	0.263	26	128	0.272	26	128	0.535
15:00 - 16:00	26	128	0.498	26	128	0.255	26	128	0.753
16:00 - 17:00	26	128	0.480	26	128	0.260	26	128	0.740
17:00 - 18:00	**26**	**128**	**0.583**	26	128	0.244	26	128	0.827
18:00 - 19:00	26	128	0.469	26	128	0.288	26	128	0.757
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			3.541			3.563			7.104

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
MULTI-MODAL BUS/TRAM PASSENGERS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	26	128	0.001	26	128	0.014	26	128	0.015
08:00 - 09:00	26	128	0.001	**26**	**128**	**0.020**	26	128	0.021
09:00 - 10:00	26	128	0.001	26	128	0.005	26	128	0.006
10:00 - 11:00	26	128	0.002	26	128	0.003	26	128	0.005
11:00 - 12:00	26	128	0.003	26	128	0.005	26	128	0.008
12:00 - 13:00	26	128	0.002	26	128	0.003	26	128	0.005
13:00 - 14:00	26	128	0.004	26	128	0.003	26	128	0 007
14:00 - 15:00	26	128	0.004	26	128	0.003	26	128	0.007
15:00 - 16:00	**26**	**128**	**0.016**	26	128	0.007	**26**	**128**	**0.023**
16:00 - 17:00	26	128	0.009	26	128	0.002	26	128	0.011
17:00 - 18:00	26	128	0.007	26	128	0.002	26	128	0.009
18:00 - 19:00	26	128	0.015	26	128	0.005	26	128	0.020
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.065			0.072			0.137

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED

MULTI-MODAL TOTAL RAIL PASSENGERS

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	26	128	0.000	26	128	0.003	26	128	0.003
08:00 - 09:00	26	128	0.000	**26**	**128**	**0.005**	**26**	**128**	**0.005**
09:00 - 10:00	26	128	0.000	26	128	0.001	26	128	0.001
10:00 - 11:00	26	128	0.000	26	128	0.000	26	128	0.000
11:00 - 12:00	26	128	0.000	26	128	0.000	26	128	0.000
12:00 - 13:00	26	128	0.000	26	128	0.000	26	128	0.000
13:00 - 14:00	26	128	0.000	26	128	0.000	26	128	0.000
14:00 - 15:00	26	128	0.001	26	128	0.000	26	128	0.001
15:00 - 16:00	26	128	0.003	26	128	0.001	26	128	0.004
16:00 - 17:00	26	128	0.003	26	128	0.000	26	128	0.003
17:00 - 18:00	26	128	0.002	26	128	0.000	26	128	0.002
18:00 - 19:00	**26**	**128**	**0.003**	26	128	0.001	26	128	0.004
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.012			0.011			0.023

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
MULTI-MODAL COACH PASSENGERS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	26	128	0.000	26	128	0.000	26	128	0.000
08:00 - 09:00	26	128	0.000	**26**	**128**	**0.004**	**26**	**128**	**0.004**
09:00 - 10:00	26	128	0.000	26	128	0.000	26	128	0.000
10:00 - 11:00	26	128	0.000	26	128	0.000	26	128	0.000
11:00 - 12:00	26	128	0.000	26	128	0.000	26	128	0.000
12:00 - 13:00	26	128	0.000	26	128	0.000	26	128	0.000
13:00 - 14:00	26	128	0.000	26	128	0.000	26	128	0.000
14:00 - 15:00	26	128	0.001	26	128	0.000	26	128	0.001
15:00 - 16:00	**26**	**128**	**0.002**	26	128	0.000	26	128	0.002
16:00 - 17:00	26	128	0.000	26	128	0.000	26	128	0.000
17:00 - 18:00	26	128	0.000	26	128	0.000	26	128	0.000
18:00 - 19:00	26	128	0.000	26	128	0.000	26	128	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.003			0.004			0.007

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED

MULTI-MODAL PUBLIC TRANSPORT USERS

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	26	128	0.001	26	128	0.016	26	128	0.017
08:00 - 09:00	26	128	0.001	**26**	**128**	**0.028**	**26**	**128**	**0.029**
09:00 - 10:00	26	128	0.001	26	128	0.007	26	128	0.008
10:00 - 11:00	26	128	0.002	26	128	0.003	26	128	0.005
11:00 - 12:00	26	128	0.003	26	128	0.005	26	128	0.008
12:00 - 13:00	26	128	0.003	26	128	0.004	26	128	0.007
13:00 - 14:00	26	128	0.004	26	128	0.003	26	128	0.007
14:00 - 15:00	26	128	0.006	26	128	0.003	26	128	0.009
15:00 - 16:00	**26**	**128**	**0.020**	26	128	0.008	26	128	0.028
16:00 - 17:00	26	128	0.012	26	128	0.002	26	128	0.014
17:00 - 18:00	26	128	0.009	26	128	0.002	26	128	0.011
18:00 - 19:00	26	128	0.018	26	128	0.006	26	128	0.024
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.080			0.087			0.167

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED

MULTI-MODAL TOTAL PEOPLE

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	26	128	0.110	26	128	0.480	26	128	0.590
08:00 - 09:00	26	128	0.225	**26**	**128**	**0.842**	**26**	**128**	**1.067**
09:00 - 10:00	26	128	0.218	26	128	0.302	26	128	0.520
10:00 - 11:00	26	128	0.188	26	128	0.258	26	128	0.446
11:00 - 12:00	26	128	0.202	26	128	0.254	26	128	0.456
12:00 - 13:00	26	128	0.263	26	128	0.243	26	128	0.506
13:00 - 14:00	26	128	0.281	26	128	0.262	26	128	0.543
14:00 - 15:00	26	128	0.308	26	128	0.308	26	128	0.616
15:00 - 16:00	26	128	0.617	26	128	0.314	26	128	0.931
16:00 - 17:00	26	128	0.554	26	128	0.300	26	128	0.854
17:00 - 18:00	**26**	**128**	**0.645**	26	128	0.285	26	128	0.930
18:00 - 19:00	26	128	0.544	26	128	0.349	26	128	0.893
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			4.155			4.197			8.352

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED

MULTI-MODAL CARS

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	26	128	0.053	26	128	0.228	26	128	0.281
08:00 - 09:00	26	128	0.106	**26**	**128**	**0.310**	**26**	**128**	**0.416**
09:00 - 10:00	26	128	0.102	26	128	0.124	26	128	0.226
10:00 - 11:00	26	128	0.080	26	128	0.106	26	128	0.186
11:00 - 12:00	26	128	0.087	26	128	0.105	26	128	0.192
12:00 - 13:00	26	128	0.113	26	128	0.107	26	128	0.220
13:00 - 14:00	26	128	0.116	26	128	0.114	26	128	0.230
14:00 - 15:00	26	128	0.124	26	128	0.146	26	128	0.270
15:00 - 16:00	26	128	0.219	26	128	0.129	26	128	0.348
16:00 - 17:00	26	128	0.216	26	128	0.123	26	128	0.339
17:00 - 18:00	**26**	**128**	**0.284**	26	128	0.123	26	128	0.407
18:00 - 19:00	26	128	0.242	26	128	0.141	26	128	0.383
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			**1.742**			**1.756**			**3.498**

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
MULTI-MODAL LGVS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	26	128	0.013	**26**	**128**	**0.024**	26	128	0.037
08:00 - 09:00	26	128	0.016	26	128	0.021	26	128	0.037
09:00 - 10:00	26	128	0.022	26	128	0.021	26	128	0.043
10:00 - 11:00	26	128	0.022	26	128	0.021	26	128	0.043
11:00 - 12:00	26	128	0.016	26	128	0.020	26	128	0.036
12:00 - 13:00	26	128	0.019	26	128	0.015	26	128	0.034
13:00 - 14:00	26	128	0.023	26	128	0.021	**26**	**128**	**0.044**
14:00 - 15:00	26	128	0.021	26	128	0.017	26	128	0.038
15:00 - 16:00	26	128	0.020	26	128	0.023	26	128	0.043
16:00 - 17:00	26	128	0.023	26	128	0.020	26	128	0.043
17:00 - 18:00	**26**	**128**	**0.024**	26	128	0.012	26	128	0.036
18:00 - 19:00	26	128	0.012	26	128	0.010	26	128	0.022
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.231			0.225			0.456

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
MULTI-MODAL MOTOR CYCLES
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	26	128	0.000	26	128	0.002	26	128	0.002
08:00 - 09:00	26	128	0.000	**26**	**128**	**0.003**	26	128	0.003
09:00 - 10:00	26	128	0.001	26	128	0.001	26	128	0.002
10:00 - 11:00	26	128	0.001	26	128	0.000	26	128	0.001
11:00 - 12:00	26	128	0.000	26	128	0.001	26	128	0.001
12:00 - 13:00	26	128	0.001	26	128	0.000	26	128	0.001
13:00 - 14:00	26	128	0.001	26	128	0.001	26	128	0.002
14:00 - 15:00	26	128	0.001	26	128	0.001	26	128	0.002
15:00 - 16:00	26	128	0.001	26	128	0.000	26	128	0.001
16:00 - 17:00	**26**	**128**	**0.003**	26	128	0.002	**26**	**128**	**0.005**
17:00 - 18:00	26	128	0.001	26	128	0.000	26	128	0.001
18:00 - 19:00	26	128	0.002	26	128	0.001	26	128	0.003
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.012			0.012			0.024

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

Calculation Reference: AUDIT-204602-210723-0758

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 04 - EDUCATION
Category : D - NURSERY
MULTI-MODAL TOTAL VEHICLES

Selected regions and areas:
04 EAST ANGLIA
SF SUFFOLK 1 days

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

Primary Filtering selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: Gross floor area
Actual Range: 750 to 750 (units: sqm)
Range Selected by User: 176 to 2350 (units: sqm)

Parking Spaces Range: All Surveys Included

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/13 to 21/05/19

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:
Wednesday 1 days

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

Selected survey types:
Manual count 1 days
Directional ATC Count 0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaking using machines.

Selected Locations:
Edge of Town Centre 1

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:
Residential Zone 1

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Secondary Filtering selection:

Use Class:
E(f) 1 days

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

Population within 500m Range:
All Surveys Included

Secondary Filtering selection (Cont.):

Population within 1 mile:
15,001 to 20,000 1 days

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

Population within 5 miles:
75,001 to 100,000 1 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:
0.6 to 1.0 1 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:
No 1 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

PTAL Rating:
No PTAL Present 1 days

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

LIST OF SITES relevant to selection parameters

1	**SF-04-D-03**	**NURSERY**	**SUFFOLK**
	CAMP ROAD		
	LOWESTOFT		
	Edge of Town Centre		
	Residential Zone		
	Total Gross floor area:	750 sqm	
	Survey date: WEDNESDAY	*10/12/14*	*Survey Type: MANUAL*

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

TRIP RATE for Land Use 04 - EDUCATION/D - NURSERY
MULTI-MODAL TOTAL VEHICLES
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	1	750	0.400	1	750	0.133	1	750	0.533
08:00 - 09:00	**1**	**750**	**2.267**	**1**	**750**	**2.267**	**1**	**750**	**4.534**
09:00 - 10:00	1	750	0.533	1	750	0.533	1	750	1.066
10:00 - 11:00	1	750	0.000	1	750	0.000	1	750	0.000
11:00 - 12:00	1	750	0.133	1	750	0.133	1	750	0.266
12:00 - 13:00	1	750	1.200	1	750	1.200	1	750	2.400
13:00 - 14:00	1	750	0.800	1	750	0.800	1	750	1.600
14:00 - 15:00	1	750	0.000	1	750	0.000	1	750	0.000
15:00 - 16:00	1	750	0.000	1	750	0.000	1	750	0.000
16:00 - 17:00	1	750	0.133	1	750	0.133	1	750	0.266
17:00 - 18:00	1	750	2.133	1	750	2.133	1	750	4.266
18:00 - 19:00	1	750	0.133	1	750	0.400	1	750	0.533
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			**7.732**			**7.732**			**15.464**

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

Parameter summary

Trip rate parameter range selected:	750 - 750 (units: sqm)
Survey date date range:	01/01/13 - 21/05/19
Number of weekdays (Monday-Friday):	1
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 04 - EDUCATION/D - NURSERY
MULTI-MODAL OGVS
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	1	750	0.000	1	750	0.000	1	750	0.000
08:00 - 09:00	1	750	0.000	1	750	0.000	1	750	0.000
09:00 - 10:00	**1**	**750**	**0.133**	**1**	**750**	**0.133**	**1**	**750**	**0.266**
10:00 - 11:00	1	750	0.000	1	750	0.000	1	750	0.000
11:00 - 12:00	1	750	0.000	1	750	0.000	1	750	0.000
12:00 - 13:00	1	750	0.000	1	750	0.000	1	750	0.000
13:00 - 14:00	1	750	0.000	1	750	0.000	1	750	0.000
14:00 - 15:00	1	750	0.000	1	750	0.000	1	750	0.000
15:00 - 16:00	1	750	0.000	1	750	0.000	1	750	0.000
16:00 - 17:00	1	750	0.000	1	750	0.000	1	750	0.000
17:00 - 18:00	1	750	0.000	1	750	0.000	1	750	0.000
18:00 - 19:00	1	750	0.000	1	750	0.000	1	750	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.133			0.133			0.266

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 04 - EDUCATION/D - NURSERY
MULTI-MODAL VEHICLE OCCUPANTS
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	1	750	0.800	1	750	0.133	1	750	0.933
08:00 - 09:00	**1**	**750**	**2.533**	**1**	**750**	**2.267**	**1**	**750**	**4.800**
09:00 - 10:00	1	750	0.533	1	750	0.533	1	750	1.066
10:00 - 11:00	1	750	0.000	1	750	0.000	1	750	0.000
11:00 - 12:00	1	750	0.133	1	750	0.133	1	750	0.266
12:00 - 13:00	1	750	1.200	1	750	1.200	1	750	2.400
13:00 - 14:00	1	750	0.800	1	750	0.800	1	750	1.600
14:00 - 15:00	1	750	0.000	1	750	0.000	1	750	0.000
15:00 - 16:00	1	750	0.000	1	750	0.000	1	750	0.000
16:00 - 17:00	1	750	0.133	1	750	0.133	1	750	0.266
17:00 - 18:00	1	750	2.133	1	750	2.267	1	750	4.400
18:00 - 19:00	1	750	0.133	1	750	0.533	1	750	0.666
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			**8.398**			**7.999**			**16.397**

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 04 - EDUCATION/D - NURSERY
MULTI-MODAL PEDESTRIANS
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	1	750	0.267	1	750	0.000	1	750	0.267
08:00 - 09:00	**1**	**750**	**3.600**	1	750	0.667	1	750	4.267
09:00 - 10:00	1	750	0.000	1	750	0.000	1	750	0.000
10:00 - 11:00	1	750	0.000	1	750	0.000	1	750	0.000
11:00 - 12:00	1	750	0.000	1	750	0.667	1	750	0.667
12:00 - 13:00	1	750	2.667	1	750	2.000	**1**	**750**	**4.667**
13:00 - 14:00	1	750	0.800	1	750	0.800	1	750	1.600
14:00 - 15:00	1	750	0.000	1	750	0.000	1	750	0.000
15:00 - 16:00	1	750	0.000	1	750	0.000	1	750	0.000
16:00 - 17:00	1	750	0.133	**1**	**750**	**2.133**	1	750	2.266
17:00 - 18:00	1	750	0.267	1	750	1.867	1	750	2.134
18:00 - 19:00	1	750	0.000	1	750	0.000	1	750	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			**7.734**			**8.134**			**15.868**

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 04 - EDUCATION/D - NURSERY
MULTI-MODAL BUS/TRAM PASSENGERS
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	1	750	0.000	1	750	0.000	1	750	0.000
08:00 - 09:00	**1**	**750**	**0.267**	1	750	0.000	1	750	0.267
09:00 - 10:00	1	750	0.000	1	750	0.000	1	750	0.000
10:00 - 11:00	1	750	0.000	1	750	0.000	1	750	0.000
11:00 - 12:00	1	750	0.000	1	750	0.000	1	750	0.000
12:00 - 13:00	1	750	0.267	**1**	**750**	**0.267**	**1**	**750**	**0.534**
13:00 - 14:00	1	750	0.000	1	750	0.000	1	750	0.000
14:00 - 15:00	1	750	0.000	1	750	0.000	1	750	0.000
15:00 - 16:00	1	750	0.000	1	750	0.000	1	750	0.000
16:00 - 17:00	1	750	0.000	1	750	0.000	1	750	0.000
17:00 - 18:00	1	750	0.000	1	750	0.267	1	750	0.267
18:00 - 19:00	1	750	0.000	1	750	0.000	1	750	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			**0.534**			**0.534**			**1.068**

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 04 - EDUCATION/D - NURSERY
MULTI-MODAL PUBLIC TRANSPORT USERS
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	1	750	0.000	1	750	0.000	1	750	0.000
08:00 - 09:00	**1**	**750**	**0.267**	1	750	0.000	1	750	0.267
09:00 - 10:00	1	750	0.000	1	750	0.000	1	750	0.000
10:00 - 11:00	1	750	0.000	1	750	0.000	1	750	0.000
11:00 - 12:00	1	750	0.000	1	750	0.000	1	750	0.000
12:00 - 13:00	1	750	0.267	**1**	**750**	**0.267**	**1**	**750**	**0.534**
13:00 - 14:00	1	750	0.000	1	750	0.000	1	750	0.000
14:00 - 15:00	1	750	0.000	1	750	0.000	1	750	0.000
15:00 - 16:00	1	750	0.000	1	750	0.000	1	750	0.000
16:00 - 17:00	1	750	0.000	1	750	0.000	1	750	0.000
17:00 - 18:00	1	750	0.000	1	750	0.267	1	750	0.267
18:00 - 19:00	1	750	0.000	1	750	0.000	1	750	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.534			0.534			1.068

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 04 - EDUCATION/D - NURSERY
MULTI-MODAL TOTAL PEOPLE
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	1	750	1.067	1	750	0.133	1	750	1.200
08:00 - 09:00	**1**	**750**	**6.400**	1	750	2.933	**1**	**750**	**9.333**
09:00 - 10:00	1	750	0.533	1	750	0.533	1	750	1.066
10:00 - 11:00	1	750	0.000	1	750	0.000	1	750	0.000
11:00 - 12:00	1	750	0.133	1	750	0.800	1	750	0.933
12:00 - 13:00	1	750	4.133	1	750	3.467	1	750	7.600
13:00 - 14:00	1	750	1.600	1	750	1.600	1	750	3.200
14:00 - 15:00	1	750	0.000	1	750	0.000	1	750	0.000
15:00 - 16:00	1	750	0.000	1	750	0.000	1	750	0.000
16:00 - 17:00	1	750	0.267	1	750	2.267	1	750	2.534
17:00 - 18:00	1	750	2.400	**1**	**750**	**4.400**	1	750	6.800
18:00 - 19:00	1	750	0.133	1	750	0.533	1	750	0.666
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			16.666			16.666			33.332

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 04 - EDUCATION/D - NURSERY
MULTI-MODAL CARS
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	1	750	0.400	1	750	0.133	1	750	0.533
08:00 - 09:00	**1**	**750**	**2.133**	**1**	**750**	**2.133**	**1**	**750**	**4.266**
09:00 - 10:00	1	750	0.400	1	750	0.400	1	750	0.800
10:00 - 11:00	1	750	0.000	1	750	0.000	1	750	0.000
11:00 - 12:00	1	750	0.133	1	750	0.133	1	750	0.266
12:00 - 13:00	1	750	1.200	1	750	1.200	1	750	2.400
13:00 - 14:00	1	750	0.800	1	750	0.800	1	750	1.600
14:00 - 15:00	1	750	0.000	1	750	0.000	1	750	0.000
15:00 - 16:00	1	750	0.000	1	750	0.000	1	750	0.000
16:00 - 17:00	1	750	0.133	1	750	0.133	1	750	0.266
17:00 - 18:00	1	750	2.133	1	750	2.133	1	750	4.266
18:00 - 19:00	1	750	0.133	1	750	0.400	1	750	0.533
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			7.465			7.465			14.930

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 04 - EDUCATION/D - NURSERY
MULTI-MODAL LGVS
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	1	750	0.000	1	750	0.000	1	750	0.000
08:00 - 09:00	**1**	**750**	**0.133**	**1**	**750**	**0.133**	**1**	**750**	**0.266**
09:00 - 10:00	1	750	0.000	1	750	0.000	1	750	0.000
10:00 - 11:00	1	750	0.000	1	750	0.000	1	750	0.000
11:00 - 12:00	1	750	0.000	1	750	0.000	1	750	0.000
12:00 - 13:00	1	750	0.000	1	750	0.000	1	750	0.000
13:00 - 14:00	1	750	0.000	1	750	0.000	1	750	0.000
14:00 - 15:00	1	750	0.000	1	750	0.000	1	750	0.000
15:00 - 16:00	1	750	0.000	1	750	0.000	1	750	0.000
16:00 - 17:00	1	750	0.000	1	750	0.000	1	750	0.000
17:00 - 18:00	1	750	0.000	1	750	0.000	1	750	0.000
18:00 - 19:00	1	750	0.000	1	750	0.000	1	750	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.133			0.133			0.266

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

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APPENDIX G

Resource and Waste Management Plan

RESOURCE WASTE MANAGEMENT PLAN FOR A PROPOSED PARK & RIDE CARPARK AT THE FASSEROE SITE RATHNEW ASHFORD

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Report Prepared For

Wicklow County Council

Report Prepared By

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Record of Approval

Details	Written by	Approved by
Signature	Brian maguire	
Name	Brian Maguire	Chonaill Bradley
Title	Environmental Consultant	Principal Environmental Consultant
Date	11 September 2024	11 September 2024

This report considers the specific instructions and requirements of our client. It is not intended for third-party use or reliance, and no responsibility is accepted for any third party. The provisions in this report apply solely to this project and should not be assumed applicable to other developments without review and modification.

CONTENTS

1.0 INTRODUCTION

AWN Consulting Ltd. (AWN) has prepared this Resource Waste Management Plan (RWMP) on behalf of National Transport Authority (NTA) Park and Ride Development Office (PRDO) and Wicklow County Council. The Proposed Development will consist of a 210 space Park and Ride facility, located west of Junction-16 on N11, 1.3 Km east of Ashford town, Co. Wicklow.

This plan will provide information necessary to ensure that the management of Construction & Demolition (C&D) waste at the site is undertaken in accordance with the current legal and industry standards including the *Waste Management Act 1996* as amended and associated Regulations [1], *Environmental Protection Agency Act 1992* as amended [2], *Litter Pollution Act 1997* as amended [3] and National Waste Management Plan for a Circular Economy 2024 - 2030 (NWMPCE) (2024)[4]. In particular, this plan aims to ensure maximum recycling, reuse and recovery of waste with diversion from landfill, wherever possible. It also seeks to provide guidance on the appropriate collection and transport of waste from the site to prevent issues associated with litter or more serious environmental pollution (e.g. contamination of soil and/or water).

This RWMP includes information on the legal and policy framework for C&D waste management in Ireland, estimates of the type and quantity of waste to be generated by the Proposed Development and makes recommendations for management of different waste streams. The RWMP should be viewed as a live document and will be regularly revisited throughout a project's lifecycle so that opportunities to maximise waste reduction / efficiencies are exploited throughout, and that data is collected on an ongoing basis so that it is as accurate as possible

2.0 RESOURCE & WASTE MANAGEMENT IN IRELAND

2.1 National Level

The Irish Government issued a policy statement in September 1998*, Changing Our Ways* [5], which identified objectives for the prevention, minimisation, reuse, recycling, recovery and disposal of waste in Ireland. The target for C&D waste in this report was to recycle at least 50% of C&D waste within a five year period (by 2003), with a progressive increase to at least 85% over fifteen years (i.e. 2013).

In response to the *Changing Our Ways* report, a task force (Task Force B4) representing the waste sector of the already established Forum for the Construction Industry, released a report entitled '*Recycling of Construction and Demolition Waste'* [6] concerning the development and implementation of a voluntary construction industry programme to meet the Government's objectives for the recovery of C&D waste.

In September 2020, the Irish Government published a policy document outlining a new action plan for Ireland to cover the period of 2020-2025. This plan, *'A Waste Action Plan for a Circular Economy'* [7] (WAPCE), replaces the previous national waste management plan, *"A Resource Opportunity"* (2012), and was prepared in response to the 'European Green Deal' which sets a roadmap for a transition to an altered economical model, where climate and environmental challenges are turned into opportunities.

The WAPCE sets the direction for waste planning and management in Ireland up to 2025. This reorientates policy from a focus on managing waste to a much greater focus on creating circular patterns of production and consumption. Other policy statements of a number of public bodies already acknowledge the circular economy as a national policy priority.

The policy document contains over 200 measures across various waste areas including circular economy, municipal waste, consumer protection and citizen engagement, plastics and packaging, construction and demolition, textiles, green public procurement and waste enforcement.

One of the first actions to be taken was the development of the Whole of Government Circular Economy Strategy 2022-2023 'Living More, Using Less' (2021) [8] to set a course for Ireland to transition across all sectors and at all levels of Government toward circularity and was issued in December 2021. It is anticipated that the Strategy will be updated in full every 18 months to 2 years.

The Circular Economy and Miscellaneous Provisions Act 2022 [9] was signed into law in July 2022. The Act underpins Ireland's shift from a "take-make-waste" linear model to a more sustainable pattern of production and consumption, that retains the value of resources in our economy for as long as possible and that will to significantly reduce our greenhouse gas emissions. The Act defines Circular Economy for the first time in Irish law, incentivises the use of recycled and reusable alternatives to wasteful, single-use disposable packaging, introduces a mandatory segregation and incentivised charging regime for commercial waste, streamlines the national processes for End-of-Waste and By-Products decisions, tackling the delays which can be encountered by industry, and supporting the availability of recycled secondary raw materials in the Irish market, and tackles illegal fly-tipping and littering.

The Environmental Protection Agency (EPA) of Ireland issued '*Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects' in November 2021* [10]*.* These guidelines replace the previous 2006 guidelines issued by The National Construction and Demolition Waste Council (NCDWC) and the Department of the Environment, Heritage and Local Government (DoEHLG) in 2006 [11]. The guidelines provide a practical approach which is informed by best practice in the prevention and management of C&D wastes and resources from design to construction of a project, including consideration of the deconstruction of a project. These guidelines have been followed in the preparation of this document and include the following elements:

- Predicted C&D wastes and procedures to prevent, minimise, recycle and reuse wastes;
- Design teams roles and approach;
- Relevant EU, national and local waste policy, legislation and guidelines;
- Waste disposal/recycling of C&D wastes at the site;
- Provision of training for Resource Waste Manager (RM) and site crew;
- Details of proposed record keeping system;
- Details of waste audit procedures and plan; and
- Details of consultation with relevant bodies i.e. waste recycling companies, Local Authority, etc.

Section 3 of the Guidelines identifies thresholds above which there is a requirement for the preparation of a RWMP for developments. The new guidance classifies developments on a two-tiered system. Developments which do not exceed any of the following thresholds may be classed as Tier 1 development:

- New residential development of less than 10 dwellings.
- Retrofit of 20 dwellings or less.
- New commercial, industrial, infrastructural, institutional, educational, health and other developments with an aggregate floor area less than 1,250m^2.
- Retrofit of commercial, industrial, infrastructural, institutional, educational, health and other developments with an aggregate floor area less than 2,000m^2; and
- Demolition projects generating in total less than 100m^3 in volume of C&D waste.

A development which exceeds one or more of these thresholds is classed as a Tier-2 project. This development is a Tier 2 development as it is an infrastructural, development with an aggregate floor area more than 1,250m^2.

Other guidelines followed in the preparation of this report include *'Construction and Demolition Waste Management – a handbook for Contractors and Site Managers'* [12], published by FÁS and the Construction Industry Federation in 2002 and the previous guildines, 'Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects' (2006).

These guidance documents are considered to define best practice for C&D projects in Ireland and describe how C&D projects are to be undertaken such that environmental impacts and risks are minimised and maximum levels of waste recycling are achieved.

2.2 Regional Level

The proposed development is located in the Local Authority area of Wicklow County Council (WCC).

The Eastern Midlands Region (EMR) Waste Management Plan 2015 – 2021, which previously governed waste management policy in the WCC area, has been superseded as of March 2024 by the NWMPCE 2024 – 2030, the new national waste management plan for Ireland.

The NWMPCE does not dissolve the three regional waste areas. The NWCPCE sets the ambition of the plan to have a 0% total waste growth per person over the life of the Plan with an emphasis on non-household wastes including waste from commercial activities and the construction and demolition sector.

This Plan seeks to influence sustainable consumption and prevent the generation of waste, improve the capture of materials to optimise circularity and enable compliance with policy and legislation.

The national plan sets out the following strategic targets for waste management in the country that are relevant to the development:

National Targets

1B. (Construction Materials) 12% Reduction in Construction & Demolition Waste Generated by 2030.

3B. (Reuse Facilities) Provide for reuse at 10 Civic Amenity Sites, minimum

Municipal landfill charges in Ireland are based on the weight of waste disposed. In the Leinster Region, charges are approximately €140 - €160 per tonne of waste which includes an €85 per tonne landfill levy introduced under the Waste Management (Landfill Levy) (Amendment) Regulations 2015 (as amended).

The *Wicklow County Development Plan 2022 – 2028* [13] sets out a number of policies and objectives for Wicklow County in line with National, Regional and County Objectives. The goals around waste aim to are to contribute to the three pillars of 'sustainable healthy communities', 'climate action' and 'economic opportunity'. The Solid Waste Management Objective are:

CPO 15.1 *To require all developments likely to give rise to significant quantities of waste, either by virtue of the scale of the development or the nature of the development (e.g. one that involves demolition) to submit a construction management plan, which will outline, amongst other things, the plan to minimise waste generation and the plan to protect* *the environment with the safe and efficient disposal of waste from the site.*

CPO 15.2 *To require all new developments, whether residential, community, agricultural or commercial to make provision for storage and recycling facilities (in accordance with the standards set out in Development & Design Standards of this plan).*

CPO 15.3 *To facilitate the development of existing and new waste prevention and recovery facilities and in particular, to facilitate the development of 'green waste' recovery sites.*

CPO 15.4 *To facilitate the development of waste-to-energy facilities, particularly the use of landfill gas and biological waste.*

CPO 15.5 *To have regard to the Council's duty under the 1996 Waste Management Act (as amended), to provide and operate, or arrange for the provision and operation of, such facilities as may be necessary to promote reuse or for the recovery and disposal of household waste arising within its functional area.*

CPO 15.6 *To facilitate the development of sites, services and facilities necessary to achieve implementation of the objectives of the Regional Waste Management Plan.*

2.3 Legislative Requirements

The primary legislative instruments that govern waste management in Ireland and applicable to the project are:

- Waste Management Act 1996 (No. 10 of 1996) as amended.
- Environmental Protection Act 1992 (No. 7 of 1992) as amended.
- Litter Pollution Act 1997 (No. 12 of 1997) as amended.
- Planning and Development Act 2000 (No. 30 of 2000) as amended [14].
- Circular Economy and Miscellaneous Provisions Act 2022.

One of the guiding principles of European waste legislation, which has in turn been incorporated into the *Waste Management Act 1996* as amended and subsequent Irish legislation, is the principle of *"Duty of Care"*. This implies that the waste producer is responsible for waste from the time it is generated through until its legal recycling, recovery or disposal (including its method of disposal). As it is not practical in most cases for the waste producer to physically transfer all waste from where it is produced to the final destination, waste contractors will be employed to physically transport waste to the final destination. Following on from this is the concept of *"Polluter Pays"* whereby the waste producer is liable to be prosecuted for pollution incidents, which may arise from the incorrect management of waste produced, including the actions of any contractors engaged (e.g. for transportation and disposal/recovery/recycling of waste).

It is therefore imperative that the developer ensures that the waste contractors engaged by construction contractors are legally compliant with respect to waste transportation, recycling, recovery and disposal. This includes the requirement that a contractor handle, transport and recycle/recover/dispose of waste in a manner that ensures that no adverse environmental impacts occur as a result of any of these activities.

A collection permit to transport waste must be held by each waste contractor which is issued by the National Waste Collection Permit Office (NWCPO). Waste receiving facilities must also be appropriately permitted or licensed. Operators of such facilities cannot receive any waste, unless in possession of a Certificate of Registration (COR) or waste permit granted by the relevant Local Authority under the *Waste Management (Facility Permit & Registration) Regulations 2007* and amended, or a waste licence granted by the EPA. The COR/permit/licence held will specify the type and quantity of waste able to be received, stored, sorted, recycled, recovered and/or disposed of at the specified site.

3.0 DESIGN APPROACH

The client and the design team have integrated the *'Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects'* guidelines into the design workshops, to help review processes, identify and evaluate resource reduction measures and investigate the impact on cost, time, quality, buildability, second life and management post construction. Further details on these design principals can be found within the aforementioned guidance document.

The design team have undertaken the design process in line with the international best practice principles to firstly prevent wastes, reuse where possible and thereafter sustainably reduce and recover materials. The below sections have been the focal point of the design process and material selections and will continued to be analysed and investigated throughout the design process and when selecting material.

The approaches presented are based on international principles of optimising resources and reducing waste on construction projects through:

- Prevention;
- Reuse;
- Recycling;
- Green Procurement Principles;
- Off-Site Construction;
- Materials Optimisation; and
- Flexibility and Deconstruction.

3.1 Designing For Prevention, Reuse and Recycling

Undertaken at the outset and during project feasibility and evaluation the Client and Design Team considered:

- Establishing the potential for any reusable site assets (buildings, structures, equipment, materials, soils, etc.);
- Assessing any existing buildings on the site that can be refurbished either in part or wholly to meet the Client requirements; and
- Enabling the optimum recovery of assets on site.

3.2 Designing for Green Procurement

Waste prevention and minimisation pre-procurement have been discussed and will be further discussed in this section. The Design Team will discuss proposed design solutions, encourage innovation in tenders and incentivise competitions to recognise sustainable approaches. They will also discuss options for packaging reduction with the main Contractor and subcontractors/suppliers using measures such as 'Just-in-Time' delivery and use ordering procedures that avoid excessive waste. The Green procurement extends from the planning stage into the detailed design and tender stage and will be an ongoing part of the long-term design and selection process for this development.

3.3 Designing for Off-Site Construction

Use of off-site manufacturing has been shown to reduce residual wastes by up to 90% (volumetric building versus traditional). The decision to use offsite construction is typically cost led but there are significant benefits for resource management. Some further considerations for procurement which are being investigated as part of the planning stage design process are listed as follows:

- Modular buildings as these can displace the use of concrete and the resource losses associated with concrete blocks such as broken blocks, mortars, etc.;
    - Modular buildings are typically pre-fitted with fixed plasterboard and installed insulation, eliminating these residual streams from site.
- Use of pre-cast structural concrete panels which can reduce the residual volumes of concrete blocks, mortars, plasters, etc.;
- The use of prefabricated composite panels for walls and roofing to reduce residual volumes of insulation and plasterboards;
- Using pre-cast hollow-core flooring instead of in-situ ready mix flooring or timber flooring to reduce the residual volumes of concrete/formwork and wood/packaging, respectively; and
- Designing for the preferential use of offsite modular units.

3.4 Designing for Materials Optimisation During Construction

To ensure manufacturers and construction companies adopt lean production models, including maximising the reuse of materials onsite as outlined in section 3.1, structures will be designed with the intent of designing out waste. This helps to reduce the environmental impacts associated with transportation of materials and from waste management activities. This includes investigating the use of standardised sizes for certain materials to help reduce the amount of offcuts produced on site, focusing on promotion and development of off-site manufacture.

3.5 Designing for Flexibility and Deconstruction

Design flexibility has and will be investigated throughout the design process to ensure that where possible products (including buildings) only contain materials that can be recycled and are designed to be easily disassembled. Material efficiency is being considered for the duration and end of life of a building project to produce; flexible, adaptable spaces that enable a resource-efficient, low-waste future change of use; durability of materials and how they can be recovered effectively when maintenance and refurbishment are undertaken and during disassembly/deconstruction.

4.0 DESCRIPTION OF THE PROJECT

4.1 Location, Size and Scale of the Development

The proposed development comprises a car park with 210 parking spaces, including 13 designated for users with mobility impairments, 21 for electric vehicles, and an additional 21 spaces future-proofed for electric vehicles. The proposal entails the installation of fencing, kerbs, drainage, road markings, public lighting, CCTV, ticketing machines, as well as a new ESB substation and switch room. Additionally, the proposal includes the provision of active travel connections and hardstanding areas for bike shelters and lockers. The scheme also incorporates an area with two bus bays, two passenger shelters, and a dedicated bus turning circle within the site. A new all-movement uncontrolled access junction is proposed at R772 to provide access to the facility that will feature a newly added right-turning pocket lane, achieved by widening the carriageway

Figure 4.1 Site location Map of proposed Park and Ride facility

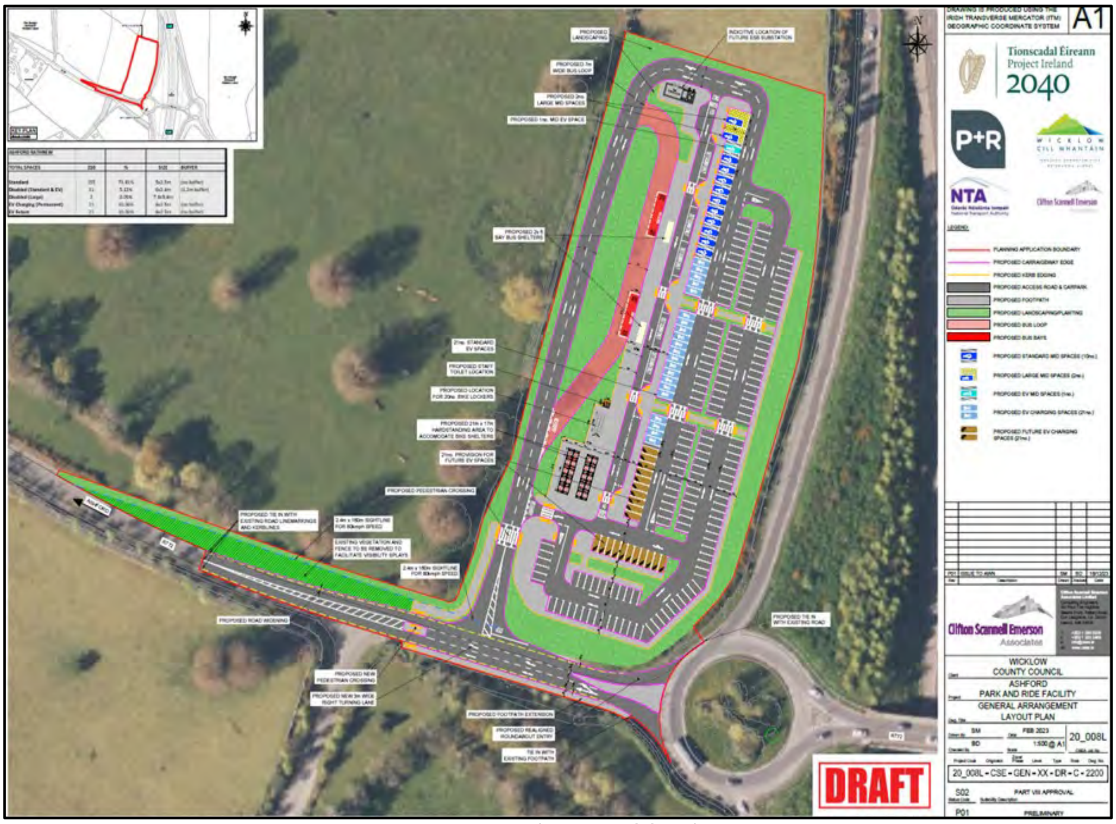

Figure 4.1 Proposed Development Layout (source: CSEA)

4.2 Details of the Non-Hazardous Wastes to be produced

There will be soil, stones, clay, gravel and made ground excavated to facilitate construction of new foundations, underground services, and the installation of the proposed foundations. The development engineers Clifton Scannell Emerson Associates have estimated that 7,401m^3 of material will need to be excavated to do so. It is currently envisaged that 1,170m^3 will be able to be retained and reused onsite for fill, the remaining material, will need to be removed offsite due to the limited opportunities for reuse on site. This will be taken for appropriate offsite reuse, recovery, recycling and / or disposal.

During the construction phase there may be a surplus of building materials, such as timber off-cuts, broken concrete blocks, cladding, plastics, metals and tiles generated. There may also be excess concrete during construction which will need to be disposed of. Plastic and cardboard waste from packaging and supply of materials will also be generated. The contractor will be required to ensure that oversupply of materials is kept to a minimum and opportunities for reuse of suitable materials is maximised.

Waste will also be generated from construction workers e.g. organic / food waste, dry mixed recyclables (waste paper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables and potentially sewage sludge from temporary welfare facilities provided on site during the construction phase. Waste printer / toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated infrequently from site offices.

4.3 Potential Hazardous Wastes to be produced

4.3.1 Contaminated Soil

Site investigations were undertaken by Ground Investigations Ireland on 6th September 2023. Samples were selected from the exploratory holes for a range of geotechnical and environmental testing to assist in the classification of soils and to provide information for the proposed design.

Prior to any excavations being carried out a Waste Classification report will be created using HazWasteOnline™ software to classify excavated material for disposal.

In the event that any potentially contaminated material is encountered, it will need to be segregated from clean / inert material, tested and classified as either non-hazardous or hazardous in accordance with the EPA publication entitled 'Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-Hazardous' [14] using the HazWasteOnline™ application (or similar approved classification method). The material will then need to be classified as clean, inert, non-hazardous or hazardous in accordance with the EC Council Decision 2003/33/EC [15], which establishes the criteria for the acceptance of waste at landfills.

In the event that Asbestos Containing Materials (ACMs) are found within the excavated material, the removal will only be carried out by a suitably permitted waste contractor, in accordance with S.I. No. 386 of 2006 Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010. All asbestos will be taken to a suitably licensed or permitted facility.

In the event that hazardous soil, or historically deposited waste is encountered during the construction phase, the contractor will notify WCC and provide a Hazardous / Contaminated Soil Management Plan, to include estimated tonnages, description of location, any relevant mitigation, destination for disposal / treatment, in addition to information on the authorised waste collector(s).

4.3.2 Fuel/Oils

As fuels and oils are classed as hazardous materials, any on-site storage of fuel/oil, all storage tanks and all draw-off points will be bunded (or stored in double-skinned tanks) and located in a dedicated, secure area of the site. Provided that these requirements are adhered to and site crew are trained in the appropriate refuelling techniques, it is not expected that there will be any fuel/oil wastage at the site.

4.3.3 Invasive Plant Species

A baseline review of biodiversity at the site was carried out by the project ecologists Doherty Environmental. No Japanese Knotweed was detected; however Giant Hogweed was found on the site during the ecological survey of the site. An invasive species management plan will need to be produced and submitted to WCC outlining a management plan to deal with the Giant Hogweed and any other invasive plant species that may be discovered during the construction phase.

Prior to construction commencing, a site invasive species survey including a site walkover survey of the entire site, and around part of the outside perimeter to search for any invasive species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended) will be undertaken.

4.3.4 Asbestos

If ACMs are detected on site, the removal of asbestos or ACMs will be carried out by a suitably qualified contractor and ACMs will only be removed from site by a suitably permitted/licenced waste contractor. in accordance with *S.I. No. 386 of 2006 Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010*. All material will be taken to a suitably licensed or permitted facility. It is not envisaged that ACM's will be encountered due to the nature of the site being a greenfield site.

4.3.5 Other known Hazardous Substances

Paints, glues, adhesives and other known hazardous substances will be stored in designated areas. They will generally be present in small volumes only and associated waste volumes generated will be kept to a minimum. Wastes will be stored in appropriate receptacles pending collection by an authorised waste contractor.

In addition, WEEE (containing hazardous components), printer toner/cartridges, batteries (Lead, Ni-Cd or Mercury) and/or light bulbs and other mercury containing waste may be generated from during C&D activities or temporary site offices. These wastes (if encountered) will be stored in appropriate receptacles in designated areas of the site pending collection by an authorised waste contractor.

5.0 ROLES AND RESPONSIBILITIES

The *Best Practice Guidelines on the Preparation of Resource Waste Management Plans for Construction and Demolition Projects* promotes that a RM will be appointed. The RM may be performed by number of different individuals over the life-cycle of the Project, however it is intended to be a reliable person chosen from within the Planning/Design/Contracting Team, who is technically competent and appropriately trained, who takes the responsibility to ensure that the objectives and measures within the Project RWMP are complied with. The RM is assigned the requisite authority to meet the objective and obligations of the RWMP. The role will include the important activities of conducting waste checks/audits and adopting construction methodology that is designed to facilitate maximum reuse and/or recycling of waste.

5.1 Role of the Client

The Client and the body establishing the aims and the performance targets for the project.

- The Client has commissioned the preparation and submission of a preliminary RWMP as part of the design and planning submission;
- The Client is to commission the preparation and submission of an updated RWMP as part of the construction tendering process;
- The Client will ensure that the RWMP is agreed on and submitted to the local authority prior to commencement of works on site;
- The Client is to request the end-of-project RWMP from the Contractor.

5.2 Role of the Client Advisory Team

The Client Advisory Team or Design Team is responsible for:

- Drafting and maintaining the RWMP through the design, planning and procurement phases of the project;
- Appointing a Resource Manager (RM) to track and document the design process, inform the Design Team and prepare the RWMP.
- Including details and estimated quantities of all projected waste streams with the support of environmental consultants/scientists. This will also include data on waste types (e.g. waste characterisation data, contaminated land assessments, site investigation information) and prevention mechanisms (such as by-products) to illustrate the positive circular economy principles applied by the Design Team;
- Handing over of the RWMP to the selected Contractor upon commencement of construction of the development, in a similar fashion to how the safety file is handed over to the Contractor;
- Working with the Contractor as required to meet the performance targets for the project.

5.3 Future Role of the Contractor

The construction contractors have not yet been decided upon for this RWMP. However, once select they will have major roles to fulfil. They will be responsible for:

- Preparing, implementing and reviewing the RWMP during the construction phase (including the management of all suppliers and sub-contractors) as per the requirements of these guidelines;
- Identifying a designated and suitably qualified RM who will be responsible for implementing the RWMP;
- Identifying all hauliers to be engaged to transport each of the resources / wastes off-site;
- Implementing waste management policies whereby waste materials generated on site are to be segregated as far as practicable;
- Identifying all destinations for resources taken off-site. As above, any resource that is legally classified as a ‘waste’ must only be transported to an authorised waste facility;
- End-of-waste and by-product notifications addressed with the EPA where required;
- Clarification of any other statutory waste management obligations, which could include on-site processing;
- Full records of all resources (both wastes and other resources) will be maintained for the duration of the project; and
- Preparing a RWMP Implementation Review Report at project handover.

6.0 KEY MATERIALS & QUANTITIES

6.1 Project Resource Targets

Project specific resource and waste management targets for the site have not yet been set and this information will be updated for these targets once these targets have been confirmed by the client. However, it is expected for projects of this nature that a minimum of 70% of waste is fully re-used, recycled or recovered where possible. Target setting will inform the setting of project-specific benchmarks to track target progress. Typical Key Performance Indicators (KPIs) that may be used to set targets include (as per guidelines):

- Weight (tonnes) or Volume (m^3) of waste generated per construction value;
- Weight (tonnes) or Volume (m^3) of waste generated per construction floor area (m^2);
- Fraction of resource reused on site;
- Fraction of resource notified as by-product;
- Fraction of waste segregated at source before being sent off-site for recycling/recovery; and
- Fraction of waste recovered, fraction of waste recycled, or fraction of waste disposed.

6.2 Main C&D Waste Categories

The main non-hazardous and hazardous waste streams that could be generated by the construction activities at a typical site are shown in Table 6.1. The List of Waste (LoW) code (as effected from 1 June 2015) (also referred to as the European Waste Code or EWC) for each waste stream is also shown.

Table 6.1 Typical waste types generated and LoW codes (*individual waste types may contain hazardous substances)

Waste Material	LoW/EWC Code
Concrete, bricks, tiles, ceramics	17 01 01-03 & 07
Wood, glass and plastic	17 02 01-03
Bituminous mixtures, coal tar and tarred products	17 03 01*, 02 & 03*
Metals (including their alloys) and cable	17 04 01-11
Soil and stones	17 05 03* & 04
Paper and cardboard	20 01 01
Mixed C&D waste	17 09 04
Green waste	20 02 01
Electrical and electronic components	20 01 35 & 36
Batteries and accumulators	20 01 33 & 34
Liquid fuels	13 07 01-10
Chemicals (solvents, pesticides, paints, adhesives, detergents etc.)	20 01 13, 19, 27-30
Organic (food) waste	20 01 08
Mixed Municipal Waste	20 03 01

7.0 WASTE MANAGEMENT

There will be some waste materials generated from modifications required to the existing internal access road and surface water, foul and process wastewater drainage systems.

Table 7.1 shows the breakdown of C&D waste types produced on a typical site based on data from the EPA *National Waste Reports, the GMIT* [16] and other research reports.

Table 7.1 Waste materials generated on a typical Irish construction site

Waste Types	%
Mixed C&D	33
Timber	28
Metals	8
Concrete	6
Other	15
Total	**100**

Table 7.2 shows the predicted construction waste generation for the Proposed Development based on the information available to date along with the targets for management of the waste streams. The predicted waste amounts are based on an average largescale development waste generation rate per m^2, using the waste breakdown rates shown in Table 7.1.

Table 7.2 Estimated off-site reuse, recycle and disposal rates for construction waste

Waste Type	Tonnes	Reuse		Recycle/Recovery		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Mixed C&D	39.8	10	4.0	80	31.9	10	4.0
Timber	13.5	40	5.4	55	7.4	5	0.7
Metals	9.7	5	0.5	90	8.7	5	0.5
Concrete	7.2	30	2.2	65	4.7	5	0.4
Other	36.2	20	7.2	60	21.7	20	7.2
Total	106.5		19.3		74.4		12.8

In addition to the information in Table 7.2, it is estimated that c. 7,401 m^3 of soil, stone, gravel, clay & made ground will be excavated to facilitate construction of new foundations, installation of service and associated ancillary services. It is estimated that 6,231m^3 of material is to be removed and disposed of offsite by a permitted waste management company for recovery and/or disposal at a suitably permitted/ licensed facility.

7.1 Proposed Resource and Waste Management Options

Waste materials generated will be segregated on site, where it is practical. Where the on-site segregation of certain waste types is not practical, off-site segregation will be carried out. There will be skips and receptacles provided to facilitate segregation at source where feasible. All waste receptacles leaving site will be covered or enclosed. The appointed waste contractor will collect and transfer the wastes as receptacles are filled. There are numerous waste contractors in the WCC Region that provide this service.

All waste arisings will be handled by an approved waste contractor holding a current waste collection permit. All waste arising's requiring disposal off-site will be reused, recycled, recovered or disposed of at a facility holding the appropriate registration, permit or licence, as required.

National End-of-Waste Decision EoW-N001/2023 (Regulation 28) published by the EPA in September 2023, establishes criteria determining when recycled aggregate resulting from a recovery operation ceases to be waste. Material from this proposed development will be investigated to see if it can cease to be a waste under the requirements of the National End of Waste Criteria for Aggregates.

During construction, some of the sub-contractors on site will generate waste in relatively low quantities. The transportation of non-hazardous waste by persons who are not directly involved with the waste business, at weights less than or equal to 2 tonnes, and in vehicles not designed for the carriage of waste, are exempt from the requirement to have a waste collection permit (per Article 30 (1) (b) of the Waste Collection Permit Regulations 2007, as amended). Any sub-contractors engaged that do not generate more than 2 tonnes of waste at any one time can transport this waste off-site in their work vehicles (which are not designed for the carriage of waste). However, they are required to ensure that the receiving facility has the appropriate COR / permit / licence.

Written records will be maintained by the contractor(s) detailing the waste arising throughout the construction phase, the classification of each waste type, waste collection permits for all waste contactors who collect waste from the site and COR/permit or licence for the receiving waste facility for all waste removed off site for appropriate reuse, recycling, recovery and/or disposal.

Dedicated bunded storage containers will be provided for hazardous wastes which may arise such as batteries, paints, oils, chemicals etc, if required.

The management of the main waste streams is outlined as follows:

Soil, Stone, Gravel, Clay & Made Ground

The waste hierarchy states that the preferred option for waste management is prevention and minimisation of waste, followed by preparing for reuse and recycling / recovery, energy recovery (i.e. incineration) and, least favoured of all, disposal. The excavations are required to facilitate construction works so the preferred option (prevention and minimisation) cannot be accommodated for the excavation phase.

It is anticipated that 7,401m^3 of topsoil and subsoil will be excavated. It is anticipated and 1,170m^3 of excavated topsoil will be reused on site. It is anticipated that 6,231m^3 of subsoil and topsoil material will need to be removed offsite for appropriate reuse, recovery and/or disposal.

If material is removed off-site it could be reused as a by-product (and not as a waste). If this is done, it will be done in accordance with Regulation 27 (By-products), as amended, of S.I. No. 323/2020 - European Union (Waste Directive) Regulations 2011-2020, (Previously Article 27 of the European Communities (Waste Directive)), which requires that certain conditions are met and that by-product notifications are made to the EPA via their online notification form. Excavated material should not be removed from site until approval from the EPA has been received. The potential to reuse material as a by-product will be confirmed during the course of the excavation works, with the objective of eliminating any unnecessary disposal of material.

The next option (beneficial reuse) may be appropriate for the excavated material. Clean inert material may be used as fill material in other construction projects or engineering fill for waste licensed sites. Beneficial reuse of surplus excavation material as engineering fill may be subject to further testing to determine if materials meet the specific engineering standards for their proposed end use.

Any nearby sites requiring clean fill/capping material will be contacted to investigate reuse opportunities for clean and inert material. If any of the material is to be reused on another site as a by-product (and not as a waste), this will be done in accordance with Regulation 27. Similarly, if any soils/stones are imported onto the site from another construction site as a by-product, this will also be done in accordance with Regulation 27. Regulation 27 will be investigated to see if the material can be imported onto this site for beneficial reuse instead of using virgin materials.

If the material is deemed to be a waste, then removal and reuse / recovery / disposal of the material will be carried out in accordance with the *Waste Management Act 1996* as amended, the *Waste Management (Collection Permit) Regulations 2007* as amended and the *Waste Management (Facility Permit & Registration) Regulations 2007* as amended. Once all available beneficial reuse options have been exhausted, the options of recycling and recovery at waste permitted and licensed sites will be considered.

In the unlikely event that contaminated material is encountered and subsequently classified as hazardous, this material will be stored separately to any non-hazardous material. It will require off-site treatment at a suitable facility or disposal abroad via Trans frontier Shipment of Wastes (TFS).

Bedrock

While it is not envisaged that bedrock will be encountered, if bedrock is encountered, it is anticipated that it will not be crushed on site. Any excavated rock is expected to be removed off- site for appropriate reuse, recovery and / or disposal.

Silt & Sludge
Silt and petrochemical interception will be carried out on runoff and pumped water from site works, where required. Sludge and silt will then be collected by a suitably licensed contractor and removed offsite.

Concrete Blocks, Bricks, Tiles & Ceramics
The majority of concrete generated as part of the construction works are expected to be clean, inert material and will be recycled, where possible.

Hard Plastic
As hard plastic is a highly recyclable material, much of the plastic generated will be primarily from material off-cuts. All recyclable plastic will be segregated and recycled, where possible.

Timber
Timber that is uncontaminated, i.e. free from paints, preservatives, glues etc., will be disposed of in a separate skip and recycled off-site.

Metal
Metals will be segregated where practical and stored in skips. Metal is highly recyclable and there are numerous companies that will accept these materials.

Waste Electrical and Electronic Equipment (WEEE)
Any WEEE will be stored in dedicated covered cages/receptacles/pallets pending collection for recycling.

Other Recyclables
Where any other recyclable wastes such as cardboard and soft plastic are generated, these will be segregated at source into dedicated skips and removed off-site.

Non-Recyclable Waste
C&D waste which is not suitable for reuse or recovery, such as polystyrene, some plastics and some cardboards, will be placed in separate skips or other receptacles. Prior to removal from site, the non-recyclable waste skip/receptacle will be examined by a member of the waste team (see Section 9.0) to determine if recyclable materials have been placed in there by mistake. If this is the case, efforts will be made to determine the cause of the waste not being segregated correctly and recyclable waste will be removed and placed into the appropriate receptacle.

Asbestos Containing Materials
Any asbestos or ACM found on-site will be removed by a suitably competent contractor and disposed of as asbestos waste before the construction works begin. All asbestos removal work or encapsulation work must be carried out in accordance with the Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010.

Other Hazardous Wastes
On-site storage of any hazardous wastes produced (i.e. contaminated soil if encountered and/or waste fuels) will be kept to a minimum, with removal off-site organised on a regular basis. Storage of all hazardous wastes on-site will be undertaken so as to minimise exposure to on-site personnel and the public and to also minimise potential for environmental impacts. Hazardous wastes will be recovered, wherever possible, and failing this, disposed of appropriately.

On-Site Crushing

It is currently not envisaged that the crushing of waste materials will occur on-site. However, if the crushing of material is to be undertaken, a mobile waste facility permit will first be obtained from WCC and the destination of the accepting waste facility or if an application under Regulation 28 will be made using National End-of-Waste Decision EoW-N001/2023, will be supplied to the WCC waste unit.

It should be noted that until a construction contractor is appointed it is not possible to provide information on the specific destinations of each construction waste stream. Prior to commencement of construction and removal of any waste offsite, details of the destination of each waste stream will be provided to WCC by the project team.

7.2 Tracking and Documentation Procedures for Off-Site Waste

All waste will be documented prior to leaving the site. Waste will be weighed by the contractor, either by weighing mechanism on the truck or at the receiving facility. These waste records will be maintained on site by the nominated project RM (see Section 9.0).

All movement of waste and the use of waste contractors will be undertaken in accordance with the *Waste Management Acts 1996 - 2011*, *Waste Management (Collection Permit) Regulations 2007* as amended and *Waste Management (Facility Permit & Registration) Regulations 2007* and amended. This includes the requirement for all waste contractors to have a waste collection permit issued by the NWCPO. The nominated project waste manager (see Section 9.0) will maintain a copy of all waste collection permits on-site.

If the waste is being transported to another site, a copy of the Local Authority waste COR/permit or EPA Waste/IE Licence for that site will be provided to the nominated project waste manager (see Section 9.0). If the waste is being shipped abroad, a copy of the Transfrontier Shipping (TFS) notification document will be obtained from DCC (as the relevant authority on behalf of all local authorities in Ireland) and kept on-site along with details of the final destination (COR, permits, licences etc.). A receipt from the final destination of the material will be kept as part of the on-site waste management records.

All information will be entered in a waste management recording system to be maintained on site.

8.0 ESTIMATED COST OF WASTE MANAGEMENT

An outline of the costs associated with different aspects of waste management is provided below.

The total cost of C&D waste management will be measured and will take into account handling costs, storage costs, transportation costs, revenue from rebates and disposal costs.

8.1 Reuse

By reusing materials on site, there will be a reduction in the transport and recycle/recovery/disposal costs associated with the requirement for a waste contractor to take the material off-site.

Clean and inert soils, gravel, stones etc. which cannot be reused on site may be used as access roads or capping material for landfill sites etc. This material is often taken free of charge or a reduced fee for such purposes, reducing final waste disposal costs.

8.2 Recycling

Salvageable metals will earn a rebate which can be offset against the costs of collection and transportation of the skips.

Clean uncontaminated cardboard and certain hard plastics can also be recycled. Waste contractors will charge considerably less to take segregated wastes, such as recyclable waste, from a site than mixed waste.

Timber can be recycled as chipboard. Again, waste contractors will charge considerably less to take segregated wastes such as timber from a site than mixed waste.

8.3 Disposal

Landfill charges are currently at around €140 - €160 per tonne which includes a €85 per tonne landfill levy specified in the *Waste Management (Landfill Levy) Regulations 2015 as amended*. In addition to disposal costs, waste contractors will also charge a collection fee for skips.

Collection of segregated C&D waste usually costs less than municipal waste. Specific C&D waste contractors take the waste off-site to a licensed or permitted facility and, where possible, remove salvageable items from the waste stream before disposing of the remainder to landfill. Clean soil, rubble, etc. is also used as fill/capping material, wherever possible.

9.0 TRAINING PROVISIONS

A member of the construction team will be appointed as the RM to ensure commitment, operational efficiency and accountability in relation to waste management during the C&D phases of the development.

9.1 Resource Waste Manager Training and Responsibilities

The nominated RM will be given responsibility and authority to select a waste team if required, i.e. members of the site crew that will aid them in the organisation, operation and recording of the waste management system implemented on site.

The RM will have overall responsibility to oversee, record and provide feedback to the client on everyday waste management at the site. Authority will be given to the Waste Manager to delegate responsibility to sub-contractors, where necessary, and to coordinate with suppliers, service providers and sub-contractors to prioritise waste prevention and material salvage.

The RM will be trained in how to set up and maintain a record keeping system, how to perform an audit and how to establish targets for waste management on site. The RM will also be trained in the best methods for segregation and storage of recyclable materials, have information on the materials that can be reused on site and be knowledgeable in how to implement this RWMP.

9.2 Site Crew Training

Training of site crew in relation to waste is the responsibility of the Waste Manager and, as such, a waste training program will be organised. A basic awareness course will be held for all site crew to outline the RWMP and to detail the segregation of waste materials at source. This may be incorporated with other site training needs such as general site induction, health and safety awareness and manual handling.

This basic course will describe the materials to be segregated, the storage methods and the location of the Waste Storage Area (WSA). A sub-section on hazardous wastes will be incorporated into the training program and the particular dangers of each hazardous waste will be explained.

10.0 TRACKING AND TRACING / RECORD KEEPING

Records will be kept for all waste material which leaves the site, either for reuse on another site, recycling or disposal. A recording system will be put in place to record the waste arisings on Site.

A waste tracking log will be used to track each waste movement from the site. On exit from the site, the waste collection vehicle driver will stop at the site office and sign out as a visitor and provide the security personnel or RM with a waste docket (or Waste Transfer Form (WTF) for hazardous waste) for the waste load collected. At this time, the security personnel will complete and sign the Waste Tracking Register with the following information:

- Date
- Time
- Waste Contractor
- Company waste contractor appointed by, e.g. Contractor or subcontractor name
- Collection Permit No.
- Vehicle Reg.
- Driver Name
- Docket No.
- Waste Type
- LoW
- Weight/Quantity

The waste vehicle will be checked by security personal or the RM to ensure it has the waste collection permit no. displayed and a copy of the waste collection permit in the vehicle before they are allowed to remove the waste from the site.

The waste transfer dockets will be transferred to the RM on a weekly basis and can be placed in the Waste Tracking Log file. This information will be forwarded onto the WCC Waste Regulation Unit when requested.

Each subcontractor that has engaged their own waste contractor will be required to maintain a similar waste tracking log with the waste dockets / WTF maintained on file and available for inspection on site by the main contractor as required. These subcontractor logs will be merged with the main waste log.

Waste receipts from the receiving waste facility will also be obtained by the site contractor(s) and retained. A copy of the Waste Collection Permits, CORs, Waste Facility Permits and Waste Licences will be maintained on site at all times and will be periodically checked by the RM. Subcontractors who have engaged their own waste contractors, will provide the main contractor with a copy of the waste collection permits and COR / permit / licence for the receiving waste facilities and maintain a copy on file, available for inspection on site as required.

11.0 OUTLINE WASTE AUDIT PROCEDURE

11.1 Responsibility for Waste Audit

The appointed RM will be responsible for conducting a waste audit at the site during the C&D phase of the proposed Project. Contact details for the nominated RM will be provided to the WCC Waste Regulation Unit after the main contractor is appointed and prior to any material being removed from site.

11.2 Review of Records and Identification of Corrective Actions

A review of all waste management costs and the records for the waste generated and transported off-site should be undertaken mid-way through the construction phase of the proposed Project.

If waste movements are not accounted for, the reasons for this will be established in order to see if and why the record keeping system has not been maintained. The waste records will be compared with the established recovery / reuse / recycling targets for the site. Each material type will be examined, in order to see where the largest percentage waste generation is occurring. The waste management methods for each material type will be reviewed in order to highlight how the targets can be achieved.

Upon completion of the C&D phase, a final report will be prepared, summarising the outcomes of waste management processes adopted and the total recycling / reuse / recovery figures for the development.

12.0 CONSULTATION WITH RELEVANT BODIES

12.1 Local Authority

Once the construction contractor has been appointed and they have appointed waste contractors, and prior to removal of any C&D waste materials off-site, details of the proposed destination of each waste stream will be provided to the WCC Waste Regulation Unit.

WCC will also be consulted, as required, throughout the excavation and construction phases in order to ensure that all available waste reduction, reuse and recycling opportunities are identified and utilised and that compliant waste management practices are carried out.

12.2 Recycling / Salvage Companies

The appointed waste contractor for the main waste streams managed by the construction contractors will be audited in order to ensure that relevant and up-to-date waste collection permits and facility registrations / permits / licences are held. In addition, information will be obtained regarding the feasibility of recycling each material, the costs of recycling / reclamation, the means by which the wastes will be collected and transported off-site, and the recycling / reclamation process each material will undergo off-site.

13.0 REFERENCES

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3. Litter Pollution Act 1997 (S.I. No. 12 of 1997) as amended
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6. Forum for the Construction Industry – *Recycling of Construction and Demolition Waste.*
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8. DCCAE, *Whole of Government Circular Economy Strategy 2022-2023 'Living More, Using Less*' (2021)
9. Circular Economy and Miscellaneous Provisions Act 2022.
10. Environmental Protection Agency (EPA) *'Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects' (2021)*
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12. FÁS and the Construction Industry Federation (CIF), *Construction and Demolition Waste Management – a handbook for Contractors and* site *Managers* (2002).
13. Wicklow County Council (WCC), *Wicklow County Development Plan 2022 – 2028*
14. Planning and Development Act 2000 (S.I. No. 30 of 2000) as amended
15. Council Decision 2003/33/EC, establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC.
16. EPA, *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous* (2015)
17. Environmental Protection Agency (EPA), *National Waste Database Reports 1998 – 2020*.
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APPENDIX H

Cultural Heritage Impact Assessment

CourtneyDeery
ARCHAEOLOGY & CULTURAL HERITAGE

Cultural Heritage Impact Assessment Report

Ashford Park & Ride,

Junction 16, M11 Motorway,

Rossana Lower townland, Co. Wicklow

For

AWN Consulting

Dr Clare Crowley

10th September 2024

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EXECUTIVE SUMMARY

This report describes the results of an cultural heritage impact assessment of the proposed Ashford Park and Ride site at Junction 16, M11 Motorway, in County Wicklow. It has been prepared by Courtney Deery Heritage Consultancy Ltd on behalf of Awn Consulting Ltd.

Archaeological Heritage

The proposed development site is previously undeveloped, a greenfield site, and has a level of high archaeological potential. While there are no recorded archaeological sites within it, multiple archaeological sites and features were identified during archaeological investigations in advance of the construction of the M11 motorway where it runs alongside the proposed development site, including an urn burial, cremation burial, and medieval enclosure. None of these sites had any above-ground remains and all were previously unknown. The results of these excavations and the presence of other recorded monuments in the vicinity indicate that this area was part of a Bronze Age landscape and that there was also settlement in the medieval period.

Geophysical survey was carried out across the proposed development site. None of the responses identified in the survey were interpreted as definite archaeology, but there were numerous discrete, small-scale anomalies (possible pits), as well as curvilinear and linear trends, for which a cautious archaeological interpratation is considered.

Archaeological testing will be required to confirm whether the anomalies identified by the geophysical survey within the proposed development site are archaeological in nature, and if so, to establish their nature, extent, and date. Testing will also provide a more detailed and clear assessment of the effect that the proposed development would have on archaeological material and allow for the development of a suitable mitigation strategy.

Archaeological testing was scheduled to be undertaken in early February 2024, on foot of a licence issued by the National Monuments Service (NMS) (Department of Housing, Local Government and Heritage (DHLGH)), following submission of a licence application and method statement (see Appendix 4). Last minute land access issues have resulted in a postponement of the testing.

The archaeological testing will take place as soon as permission from the landowner has been secured. This will take place well in advance of construction and under licence to the NMS (DHLGH). Should the anomalies identified in the geophysical survey prove to be archaeological in nature, these and any other archaeological features identified will be resolved in consultation with, and to the satisfaction of, the NMS (DHLGH) and the National Museum of Ireland.

Where full excavation of archaeological features has been agreed, the archaeologist will be afforded sufficient time and resources to record and remove any such features identified. Archaeological excavation ensures that the removal of any archaeological soils, features, finds and deposits is systematically and accurately recorded, drawn and photographed, providing a paper and digital archive and adding to the archaeological knowledge of a specified area (i.e. preservation by record).

Other methods of resolution that may be required by the NMS (DHLGH), depending on the nature of the archaeology revealed, include preservation in situ or preservation by design.

Architectural Heritage

The proposed development site is located within the former demesne lands of the 18th century Rossana House, a protected structure (RPS 25-14). The historic character of the demesne west of the proposed development site survives largely intact, with parkland, mature specimen trees and areas of woodland. There is no intervisibility between Rossana House and the proposed development site, a result of the undulating topography and the siting of the protected structure in a natural dip, surrounded by mature trees.

The boundary between the surviving parkland and the field in which the proposed development site is located has been present since at least the early 19th century (though modified at its southern end at the time of the motorway construction) and is integral to the setting of the protected structure and the character of its historic grounds. It is proposed to retain the majority of this boundary, with the only affected area being a short section at its southern end, where the proposed site access will be located. The site access will also require removal of part of the southern estate boundary at the R772 road.

It is recommended that the affected section of boundary between the proposed development site and the historic grounds of Rossana House, be replaced in a manner sympathetic to the setting. The landscape design for the proposed development should include a boundary treatment designed to enhance the character of the historic demesne that sits adjacent to the proposed Park and Ride site.

All recommendations are subject to approval from the National Monuments Section (NMS) of the Department of Housing, Local Government and Heritage (DHLGH) and the local planning authority who may make additional recommendations.

1. INTRODUCTION

1.1. General

This report describes the results of an cultural heritage impact assessment of the proposed Ashford Park and Ride site at Junction 16, M11 Motorway, in County Wicklow. It has been prepared by Courtney Deery Heritage Consultancy Ltd on behalf of Awn Consulting Ltd.

The objective of the report is to assess the impact of the proposed development on the receiving cultural, architectural, and archaeological heritage environments and to propose ameliorative measures to safeguard any monuments, features, finds of antiquity or features of architectural or cultural heritage merit.

1.2. Study Area

The proposed Park and Ride location is situated in the lands surrounding Junction 16 on the M11, in the townland of Rossana Lower, in the civil parish of Rathnew, in the Barony of Newcastle, County Wicklow (Figure 1).

Figure 1 Site location (in red)

1.3. Methodology

The archaeological assessment of the proposed development site was based on a desk study, based on an examination of published and unpublished documentary and cartographic material, which was supported by a field inspection. A review of the following information took place in order to inform the report:

- National Monuments in State care, as listed by the National Monuments Service (NMS) of the Department of Housing, Local Government and Heritage (DHLGH);
- Sites with Preservation Orders;
- Sites listed in the Register of Historic Monuments;
- Record of Monuments and Places (RMP) and the Sites and Monuments Record (SMR) from the Archaeological Survey of Ireland; The statutory RMP[1] records known upstanding archaeological monuments, their original location (in cases of destroyed monuments) and the position of possible sites identified as cropmarks on vertical aerial photographs. Archaeological sites identified since 1994 have been added to the non-statutory SMR database of the Archaeological Survey of Ireland (National Monuments Service, DHLGH), which is available online at www.archaeology.ie and includes both RMP and SMR sites. Archaeological sites identified since 1994 are placed on the SMR and are scheduled for inclusion on the next revision of the RMP;
- Record of Protected Structures (RPS) in the Wicklow County Development Plan (2022-2028);
- National Inventory of Architectural Heritage (NIAH) Building Survey (NIAH ratings are international, national, regional, local and record, and those of regional and above are recommended for inclusion in the RPS);
- National Inventory of Architectural Heritage (NIAH) Garden Survey (paper survey only);
- A review of artefactual material held in the National Museum of Ireland;
- Cartographical Sources, OSi Historic Mapping Archive, including early editions of the Ordnance Survey including historical mapping (such as Down Survey 1656 Map);
- The Irish archaeological excavations catalogue i.e., Excavations bulletin and Excavations Database;
- Place names; Townland names and toponomy (loganim.ie);
- National Folklore Collection (Duchas.ie);
- National Monuments Act (as amended)
- Wicklow County Development Plan (2022-2028);
- A review and interpretation of aerial imagery (OSI Aerial Imagery 1995, 2000, 2005, Aerial Premium 2013-2018, Digital Globe 2011-2013, Google Earth 2001–2022, Bing 2022) to be used in combination with historic mapping to map potential cultural heritage assets.

A bibliography of sources used is provided in the References section.

1.4. Description of proposed development

The proposed development layout (Figure 2) comprises a car park with 210 parking spaces, including 13 designated for users with mobility impairments, 21 for electric vehicles, and an additional 21 spaces future-proofed for electric vehicles. The proposal entails the installation of

[1] *The Historic and Archaeological Heritage and Miscellaneous Provisions Act 2023 was enacted in October 2023 and this this Act is now law. The Minister for Housing, Local Government and Heritage commenced certain provisions in May 2024 (S.I. No. 252/2024), however until the Act is fully commenced, the National Monuments Acts have therefore not yet been repealed and remain in force.*

fencing, kerbs, drainage, road markings, public lighting, CCTV, ticketing machines, as well as a new ESB substation and switch room. Additionally, the proposal includes the provision of active travel connections and hardstanding areas for bike shelters and lockers. The scheme also incorporates an area with two bus bays, two passenger shelters, and a dedicated bus turning circle within the site. A new all-movement uncontrolled access junction is proposed at R772 to provide access to the facility that will feature a newly added right-turning pocket lane, achieved by widening the carriageway.

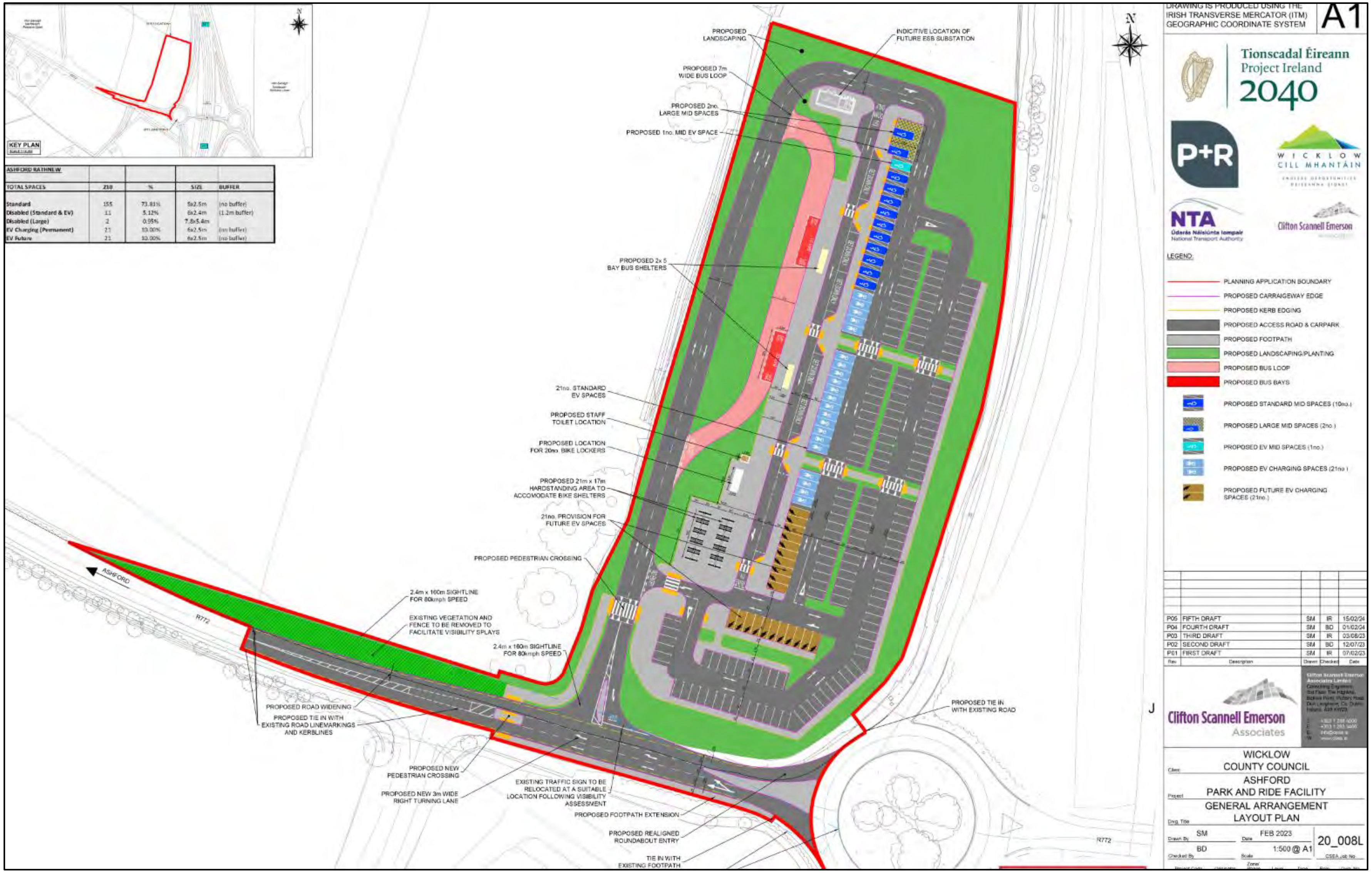

Figure 2 Proposed site layout

2. ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

2.1. Prehistoric period (c. 7000 – AD 500)

There is a wide-ranging and well-documented prehistoric archaeological presence in Co. Wicklow. The Early Bronze Age is particularly well represented with burial and settlement sites dating to this period located along the eastern part of the county. This period, which ran from c.2200 to c.1600 BC, witnessed a wide variety of burial practices. The earliest involved placing the remains of the dead, either unburnt or cremated, into a small cist (a box-like structure with sides lined with stone slabs placed on edge) and accompanied by a food vessel. Over time, the practice of burying unburnt bodies diminished and by approximately 1800BC the vast majority of burials were cremations. The practice of burial in cists also stopped and was replaced by the burial of cremated remains in simple pits or graves.

An urn burial (RMP WI025-107), a cremated pit burial (RMP WI025-108) and several hearths were identified and excavated during archaeological investigations that were carried out in advance of the construction of the Junction 16 interchange (Licence 01E1073). These features were discovered immediately to the east of the location of the proposed site, and in what was once the same field, within the former demesne lands of Rossana House. Of interest in this context, are the possible pit features identified in the geophysical survey within the proposed site (see Section 9).

Two other archaeological monuments of probable Late Bronze Age origin are recorded within the former demesne of Rossana House, less than 225m northwest of the proposed site. A circular, steep-sided mound (diameter 21m, height 3.70m) with a level summit (diameter 6.8m) is all that remains of a barrow site (RMP No. WI025-036), c. 150m northwest of the proposed site. A level circular area (diameter 11.5m) defined by a shallow fosse marks the site of a ring-ditch (WI025-036) c. 225m northwest of the proposed site.

Two small hut sites were also excavated c. 200m to the south of the proposed development site in advance of the construction of the M11 motorway (Licence No. 02E0567). Site A (RMP No. WI025-101) comprised a small crescent-shaped enclosing ditch flanked by two parallel linear drains. Site B (RMP No. WI025-102) comprised a circular enclosing ditch, a possible post-hole and other features of unknown function. A third site, Site C (RMP WI025-053), comprising two linear features with three associated pits was also excavated. The dates of the archaeological features from each of the sites are unknown. Flint artefacts were recovered from Site B, though this does not conclusively date the hut sites (excavtions.ie 2004:1877). Based on the circular morphology of the hut sites, they may date to the Bronze Age, as other excavated circular hut sites in Ireland have proven to have dated from that period.

Other Bronze Age activity in the wider landscape is attested by the presence of a burnt mound (WI025-053) in Ballybeg and three ring-ditches, one in Mountusher (WI025-051) and two in Milltown North (WI025-052 & -052001), all of which were also discovered during the M11 archaeological investigations.

2.2. Early Medieval period (c. AD 500 – AD 1200)

In the centuries prior to the Anglo-Norman invasion, the basic Irish territorial division was the túath, translated as 'tribe' or 'petty kingdom' (Kelly 1995). Its ruler was a rí tuaithe 'king of a túath', a title which encompassed the people of the túath in addition to the territory itself (Jaski 2000).

The Uí Théig tribe settled in the area around and west of Wicklow town in around 750 A.D. By about 800 A.D. the Uí Briúin Cualann had conquered the district of the Uí Théig, who were forced further west and south, the Avonmore River forming their southern boundary (Smyth 1994).

The early medieval period saw the development of a mixed-farming economy managed by kings, nobles and free farmers. There was an increase in settlement (c. AD 500–AD 1200), and the ringfort, otherwise known as the 'rath' or 'fairy fort', is the best-known native monument of this period (Stout 1997). Ringforts are enclosed farmsteads dating to the early medieval period; they are one of the most widespread archaeological sites surviving in the Irish landscape and one such monument is located c. 870m northeast of the proposed site, in Newrath townland (RMP WI025-008). The majority of the ringfort sites are univallate, surrounded by one ditch and bank, but some are surrounded by two and, to a lesser extent, three enclosing ditches and banks (known as bivallate and trivallate raths respectively). The ringfort at Newrath is situated on level ground in gently undulating terrain, it has a bivallate enclosure defined by an inner (diameter c. 25m) and outer (diameter c. 40m) fosse, that are visible as cropmarks in aerial photography (archaeology.ie).

Ringforts were not simple isolated homesteads and should be considered within their contemporary settlement landscape, which would have consisted of unenclosed settlements, farms and fields, route ways and natural resources. An additional bivallate enclosure site (RMP No. WI025-009001) is recorded c. 150m southwest of the ringfort. A possible field system (RMP No. WI025-009), visible as cropmarks on aerial photography and consisting of part of a large field (c. 80m x 70m) appears to be associated with both the bivallate ringfort and the enclosure site (archaeology.ie). Another field system (RMP WI025-068), to the northwest of these recorded monuments, is also visible on aerial photography, c. 530m northeast of the proposed site.

2.3. Medieval (c. AD 1200 – AD 1600) and Post-Medieval (c. AD 1600 – AD 1800) periods

There is recorded medieval settlement in this landscape, both in proximity to the proposed development site and in the wider landscape.

A castle site (WI025-035) is recorded c. 895m south-west in Milltown South townland. The Ordnance Survey Letters of the late 1830s describe the building as follows: *'Milltown castle, as it is called, stands in the townland of Milltown; measuring sixty-six feet in length by eighteen in breadth. The east end, about twenty six feet high remains, with a breach extending from the top half down, and the south wall remains entire to the height of about eighteen feet. The north wall and west gable are down. There is a round tower at the south west angle, nine feet diameter, the walls three feet thick and about twenty eight feet high, having six loopholes, with a window on the south side about six feet high, two feet broad and fifteen feet from the ground*'. The surviving remains were assessed in the early 2000s as being likely to represent part of an Elizabethan house (Corlett & Medlycott 2000, 79).

Five enclosure sites were excavated as part of the investigations (Licence No. 01E1073) that took place within the same field as, and to the east of, the proposed site. One of the enclosures was medieval in date, based on the recovered 12th-13th century material. Two bivallate enclosures and a single-ditch enclosure were all of post-medieval date, while the date of the fifth enclosure was not determined. The post-medieval enclosures may have been ornamental landscape features within Rossana Demesne (excavations.ie ref. 2002:1989). Several tree-ring features are recorded on the first edition OS six-inch map (1840) within the field (see Section 2.5.3).

The stone manor house, or what became known in Ireland as the 'big house', is a notable element of the rural architectural heritage. These houses were constructed by planter families or prosperous Anglo-Irish landholders in Wicklow, as elsewhere in the country, roughly between the years 1670 and 1850. They are often found near or on the sites of older ruined castles or tower houses, churches or defunct administrative centres. More commonly referred to now as country houses, they were often associated with embellished and ornamented demesne land ringed by high walls. Many are now in ruins and in many other cases demesne woodland remains as a vestigial element in landscape where all trace of the original house, its gate lodges and follies have vanished.

Rossana House (RPS 25-14) was built in the early 18th century (and later extended) and was the home of the Tighe family. Rossana was a house well-known to poet Mary Tighe (née Blachford) who often stayed there, although she would die in March 1810 at Woodstock, County Kilkenny (https://theirishaesthete.com/tag/rossana/).

3. CARTOGRAPHIC SOURCES

3.1.1. Down Survey map (1654-58)

The Down Survey of 1656-58 was, undertaken in order to measure the land forfeited from the Catholic population to be redistributed amongst merchant adventurers and loyal English soldiers. (Figure 3). The proposed development site lies within unfortified, and consequently unsurveyed, lands on the barony map of Newcastle (Figure 3). The approximate location of the site can be plotted on the map according to its proximity to the River Vartry to the north and to the townlands of Parktown (present-day Ballinapark) and Ballemikaher (present-day Ballymacahara).

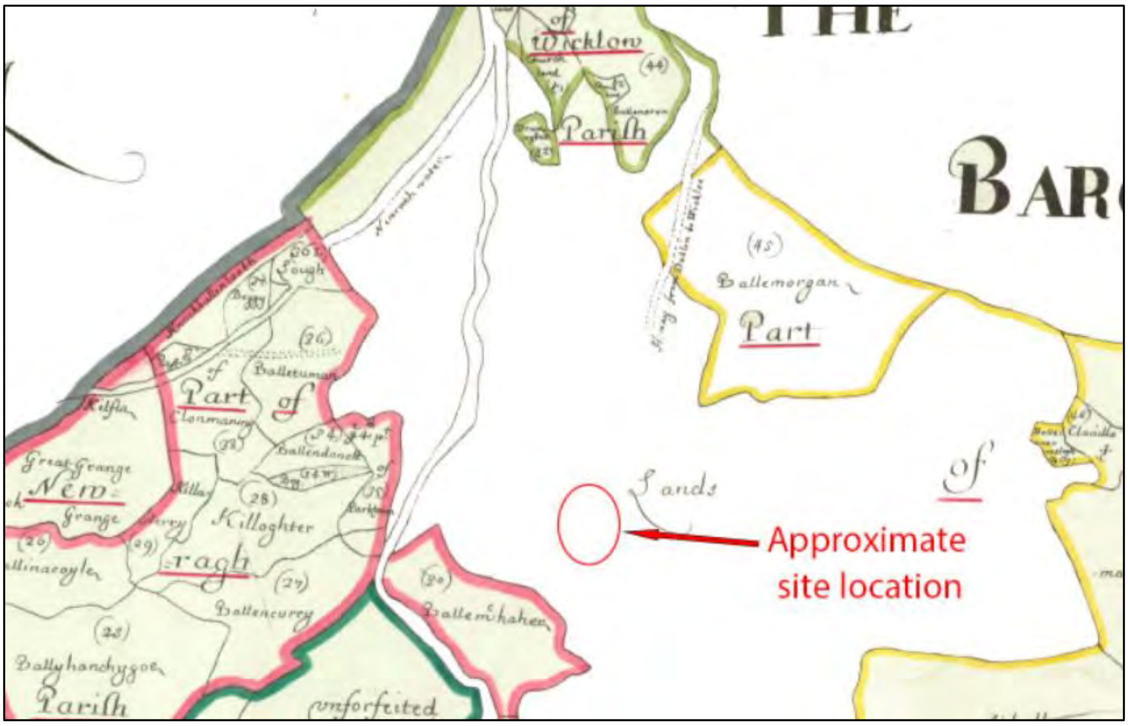

Figure 3 Detail of the Down Survey Map of the Barony of Newcastle, showing approximate site location

3.1.2. Jacob's map of County of Wicklow (1800)

The proposed development site is within undeveloped land on Jacob's map of County Wicklow (Figure 4). Several of the large houses that have given their names to the present-day townlands are depicted on the map including Rossana, Clermont and Mount Usher, within the previously unfortified lands that were depicted on the Down survey map. The proposed development site is east of Rossana House, within the demesne, which is indicated as parkland with specimen trees. A mill is indicated at the river to the northeast. There is a well-developed road network in the surrounding area.

Figure 4 Detail of Jacob's Map of County Wicklow (1800) with approximate site location (in red)

3.1.3. Ordnance Survey maps (19th to 20th century)

The Ordnance Survey first edition six-inch map (1840; Figure 5) produced maps on a national scale, recording natural features, topographical conditions, built structures and archaeological features. They represent the earliest accurate and detailed cartographic source for the study area. The map shows that the proposed development site lies within the demesne lands of Rossana House, which was built c. 1720. The house was situated close to the River Vartry, with extensions to the south and an attached range of courtyard buildings. Trees lined most of the carriageway from the entrance to the south (at the public road) and there was also woodland planting around the house and along the north-western and eastern boundaries of the estate. One of the network of paths ran parallel to the river, close to the house, and the river banks had been left unplanted immediately north and north-west of the house. The house front faced east / north-east but a projection on the northern end of the building may have housed a bay window that captured the river view.

An earthwork is shown on the map in the parkland near the house (RMP site WI025-007, mound).

The proposed development site formed part of a large, enclosed field, the boundaries of which were tree-lined. This area was distinct from the otherwise unenclosed parkland of the demesne. A tree-ring is depicted within the field (just north-east of the site boundary). It is unclear if this is a feature of antiquity or part of a designed landscape, though the presence of specimen trees around the parkland and two tree-clumps of varying size in the same field to the south and south-east (one of which may represent a smaller tree-ring) suggest the latter.

The demesne extended south of the public road and the grounds on this side included a walled garden containing an orchard and a rectangular fish pond (a common feature of 18th century estates). Beyond this, there was greater subdivision of fields, suggesting the southern half was the working part of the demesne. A tree in the road just outside the estate to the north-west was named '*Duke of Richmond's Tree*'. A police station is indicated close to the walled garden, just south of the road. Its position on private land, within the demesne rather than further north-west in Ballinalea village, suggests a connection to the estate (perhaps through funding or patronage).

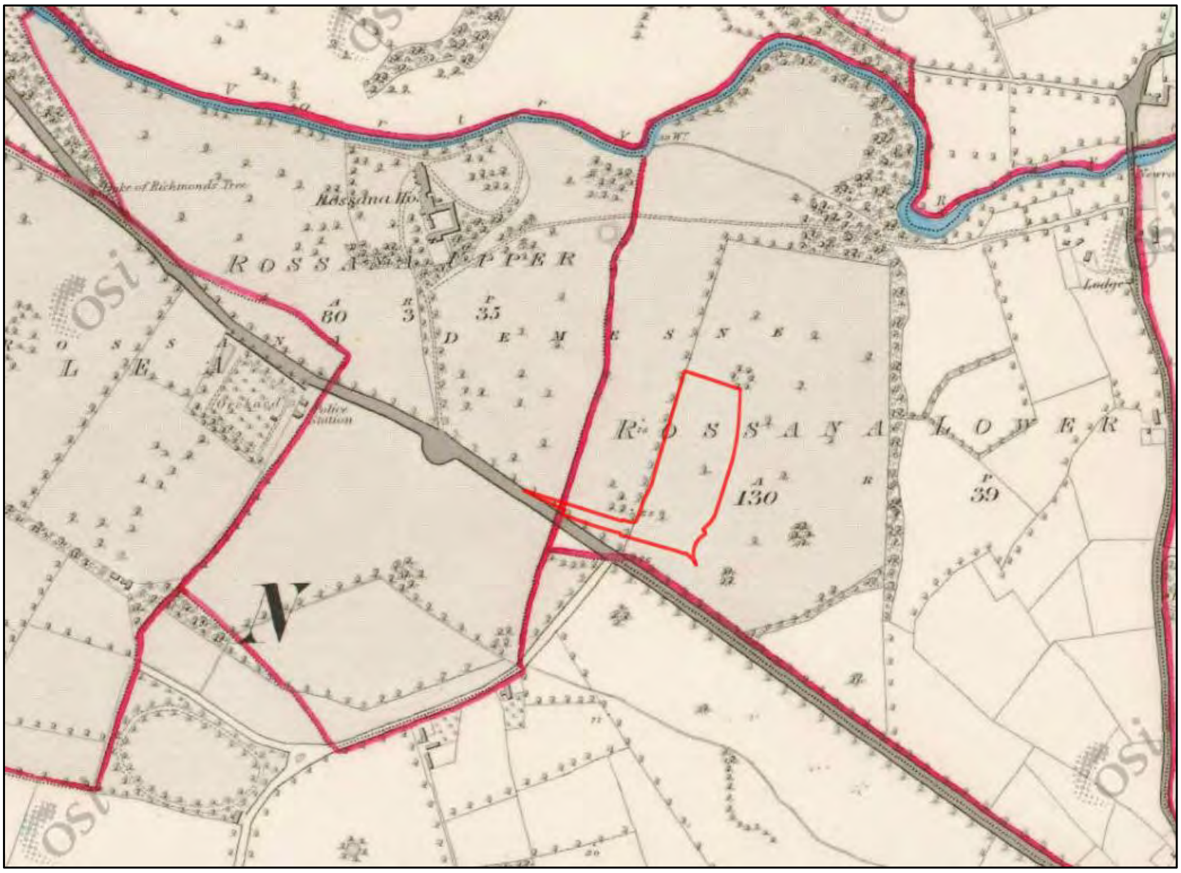

Figure 5 Detail of First Edition six-inch OS map (1840) with approximate site location (in red)

By the time of the 25-inch map (1910) there had been little significant change within the Rossana estate north of the public road (Figure 6). The tree-lined avenue had been completely planted and enclosed and additional outbuildings are depicted to the south of the courtyard. A small triangular field outside the demesne as depicted on the first edition map had been incorporated into the large, enclosed field to the east of the parkland. South of the public road, other field boundaries had also been removed to create larger fields. These changes are symptomatic of the changes in the surrounding landscape where little development had taken place yet many field boundaries had been removed since the time of the first edition map. This changing agricultural landscape may have been the result of land consolidation in the wake of the Land Acts of the late 19th and early 20th centuries. The tree-ring previously depicted to the north-east of the proposed deveopment site is no longer shown on this map edition. Similarly, on the south side of the road, the former walled garden is empty and the rectangular fish pond is now an oval pond. The police station is not indicated.

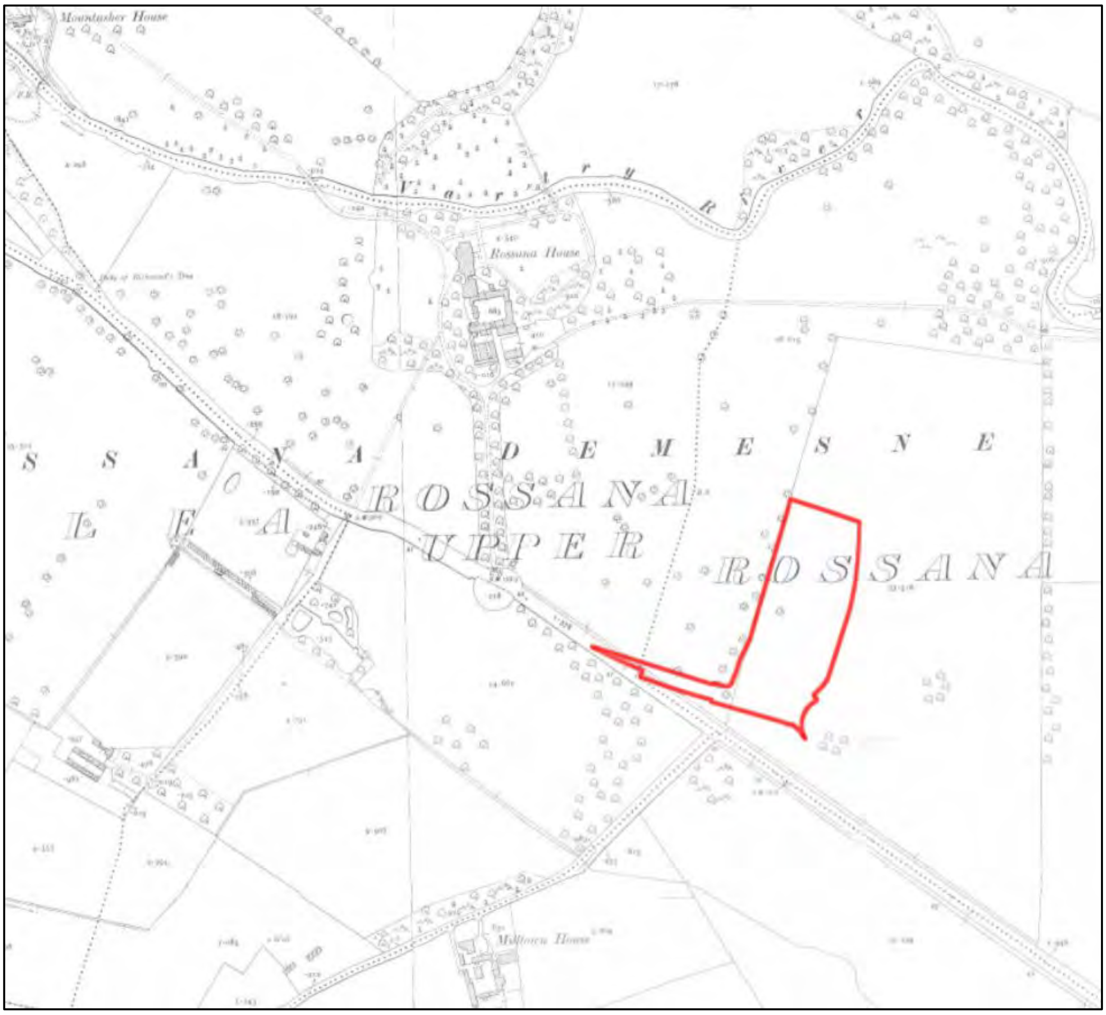

Figure 6 Detail of 25-inch OS map (1910) with approximate site location (in red)

4. AERIAL AND LIDAR IMAGERY

4.1.1. Aerial imagery

Aerial photography from the later 20th century (OSi imagery 2000; Figure 7) shows the Rossana estate and its immediate environs as much as it had been on the OS 25-inch map (Figure 6) from 90 years previously. While some residential housing had been constructed to the south, most of the development was focused on Ballinalea village to the north-west.

The M11 motorway had begun construction shortly after that (early 2000s) and its impact on the estate is clear in current aerial imagery (Figure 8). Much of the large field at the south-east end of the Rossana demesne (within which the proposed development site is located) is now occupied by the motorway carriageway and Junction 16 interchange. The R772 road, which runs along the south side of the site was realigned as part of the Motorway works. The proposed development site appears not to have been disturbed by the development of the motorway. No cropmarks relating to the tree-ring(s) are evident. Although there are no visible features within the site or its environs on aerial imagery, a number of previously unknown sites with no above-ground remains or trace were identified and excavated within this field, in the section of the motorway interchange adjacent the site (see Section 5).

Figure 7 OSi Aerial imagery (2000), showing approximate site location (in red)

Figure 8 Google Earth Pro (2021), showing site location (in red)

4.1.2. LiDAR imagery

No major depressions or rises that might be indicative of potentially significant archaeological sites are visible within the proposed development site in recent LiDAR imagery of the area (Figure 9; https://dcenr.maps.arcgis.com/apps/webappviewer). Several long, linear features and a kidney-shaped depression are discernible to the west of the proposed site, within the former demesne grounds of Rossana House.

Figure 9 LiDAR imagery (2021), showing site location (in red)

5. PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS

There have been no archaeological investigations within the proposed development site, however, archaeological investigations were carried out in its vicinity in advance of the construction of the M11 motorway (Table 1, Figure 10). Sites discovered in the area immediately adjacent the site during the investigations include a Bronze Age urn burial and cremated burial and five enclosures, one of medieval date, three post-medieval and one of uncertain date (Licence Nos. 01E0862 & 01E1073). The results of the investigations are summarised in Table 1, with additional detail provided in Appendix 1. They are also discussed in the context of the archaeological and historical background in Section 2.

Table 1 Previous archaeological investigations in the vicinity of the proposed development site

Licence No.	Excavations.ie Ref.	Townland / Project	Archaeology
01E0862	2001:1384	Rossana Lower / Testing N11 Newtownmountkennedy to Ballynabarny	Medieval / post-medieval – five enclosures, later excavated under 01E1073
01E1073	2001:1385 / 2002:1989	Rossana Lower / Excavation N11 Newtownmountkennedy to Ballynabarny	Bronze Age – urn burial, cremated pit burial and numerous hearths.

Licence No.	Excavations.ie Ref.	Townland / Project	Archaeology
			Medieval / post-medieval – one 12tth-13th century enclosure, two bivallate post-medieval enclosures, one single-ditch post-medieval enclosure and one enclosure of uncertain date.
02E0567	2004:1877	Milltown North / Excavation N11 Newtownmountkennedy to Ballynabarny	Hut sites of unknown date with unprovenanced flint artefacts. Site A – small enclosing ditch, field drains Site B – circular enclosing ditch and post-hole Site C – linear features and pits
02E0703	2002:1979	Milltown North / Excavation N11 Newtownmountkennedy to Ballynabarny	Bronze Age – two ring-ditches, two urn burials, a possible cremation pit and associated pits

Figure 10 Previous archaeological investigations in the vicinity of the proposed development site

6. DESIGNATED SITES

6.1. Archaeological Heritage

6.1.1. National Monuments in State care

There are no National Monuments in State care within the proposed development site or its vicinity.

6.1.2. Recorded Monuments (RMP/SMR sites)

There are no RMP / SMR sites within the proposed development site. There are 21 recorded within a 1km radius (Figure 11 and Table 5 below). Twelve of these were identified during archaeological investigations in advance of the M11 motorway construction and have been fully excavated, with 11 not scheduled for inclusion in the next revision of the RMP (see Table 2).

The excavated sites include the three recorded sites closest to the proposed development boundary. WI025-106 is recorded as simply 'enclosure' though in fact five enclosures were excavated in this area. While some of the enclosures excavated proved to be post-medieval in date – presumably related to landscape design in Rossana demesne – one was medieval. As there was also an urn burial and cremation pit (WI025-107, -108), this points to settlement and activity in the immediate area during the Bronze Age and the medieval period.

The remaining sites include a mound and ring-ditch recorded within Rossana Demesne in the parkland east / south-east of the house (RMP WI025-007, -036), providing further evidence of Bronze Age activity in the lands south of the River Vartry. There are also indications of continuity of settlement in this landscape, with sites of likely early medieval date recorded in Newrath townland to the east, comprising a ringfort, enclosure, and two field systems (RMP WI025-008, -009, -009001, -068), an unclassified castle site in Milltown North (WI025-035), and further prehistoric activity recorded north and south along the Motorway.

The recorded sites are discussed in the context of the archaeological and historical background in Section 2, and described in Appendix 1.

Table 2 RMP / SMR sites within 1km of the proposed development site

RMP / SMR No.	Classification	Scheduled for inclusion in RMP update	Townland	ITM E	ITM N	Distance
WI025-007	Mound	Yes	ROSSANA UPPER	727897	696642	c. 200m NW
WI025-008	Ringfort - unclassified	Yes	NEWRATH	728942	696474	c. 820m ENE
WI025-009	Field system	Yes	NEWRATH	728843	696315	c. 685m E
WI025-009001	Enclosure	Yes	NEWRATH	728814	696365	c. 685m E
WI025-035	Castle - unclassified	Yes	MILLTOWN NORTH	727396	695499	c. 895m SW
WI025-036	Ring-ditch		ROSSANA UPPER	727803	696574	c. 190m WNW
WI025-050	Habitation site	No	MOUNTUSHER	727621	697318	c. 935m NW
WI025-051	Ring-ditch	No	MOUNTUSHER	727732	697136	c. 730m NW
WI025-052	Ring-ditch	No	MILLTOWN NORTH	727941	695617	c. 920m
WI025-052001	Ring-ditch	Yes	MILLTOWN NORTH	727941	695617	c. 615m S
WI025-053	Burnt mound	No	BALLYBEG (Newcastle By.)	727854	695419	c. 825m S
WI025-058	Excavation – misc.	No	MILLTOWN NORTH	727883	695505	c. 730m S
WI025-068	Field system	Yes	NEWRATH	728657	696614	c. 535m ENE
WI025-096	Excavation – misc.	Yes	INCHANAPPA SOUTH	727542	697276	c. 930m NW
WI025-097	Excavation – misc.	Yes	INCHANAPPA SOUTH	727393	697166	
WI025-101	Hut site	No	MILLTOWN NORTH	728069	695994	c. 205m SSE
WI025-102	Hut site	No	MILLTOWN NORTH	728033	695951	c. 240m SSE
WI025-103	Excavation – misc.	No	MILLTOWN NORTH	727990	695764	c. 430m SSE
WI025-106	Enclosure	No	ROSSANA LOWER	728087	696334	Adjacent to E
WI025-107	Urn burial	No	ROSSANA LOWER	728087	696334	Adjacent to E
WI025-108	Cremation pit	No	ROSSANA LOWER	728087	696334	Adjacent to E

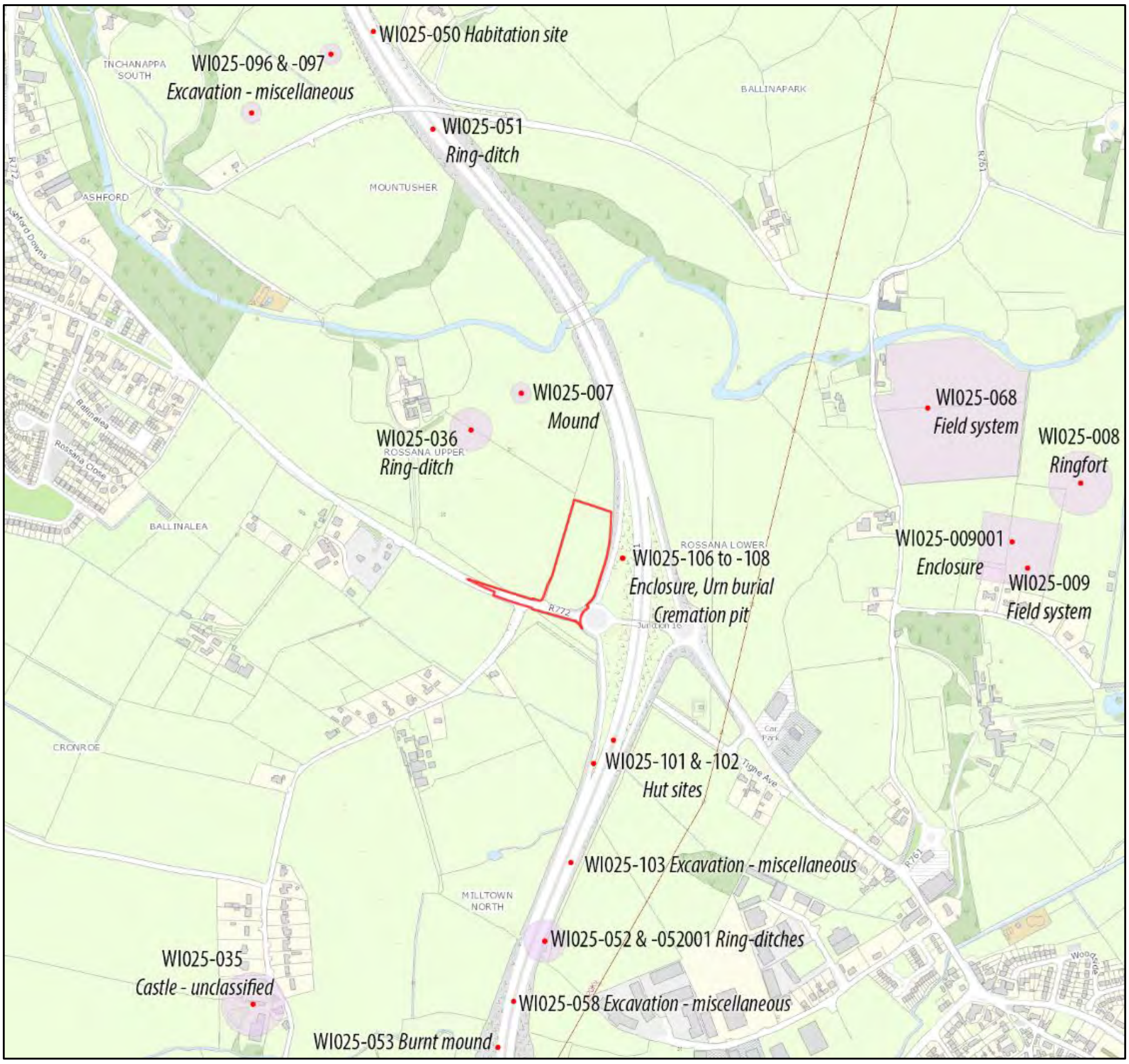

Figure 11 RMP / SMR sites within 1km of proposed development site

6.2. Architectural Heritage

6.2.1. Record of Protected Structures (RPS)

Rossana House, a protected structure, is located c. 395m north-west of the proposed development site and is the only designated architectural heritage site (RPS / NIAH) within 500m (RPS Ref. 25-14 / NIAH Reg. No. 16402509) (Figure 12, Table 3). The proposed development site is located within the former demesne lands of Rossana House, a protected structure.

The house is a detached five-bay three-storey country house, built in c. 1720. It is constructed in Flemish bond red brick and part of the dwelling was demolished c. 1950; the remaining portion of this early 18th century house is substantially original. According to the NIAH appraisal, the house is important both for its age and style, adding much to the local heritage (buildingsofireland.ie). Lewis (1837) notes that it was in Rossana House that Mary Tighe composed her epic poem, ‘Psyche’.

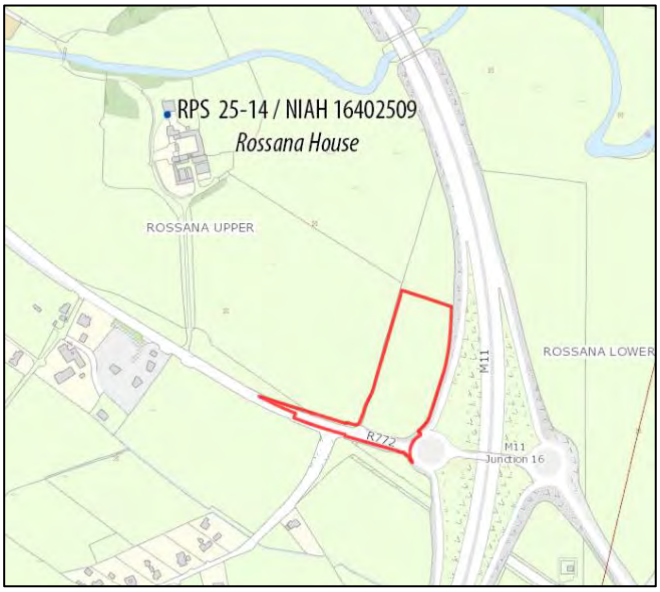

Figure 12 RPS / NIAH sites within c. 500m of proposed development site

The house is set within a well-wooded demesne, which is included in the NIAH Garden Survey (Site ID 4366). The low-lying, enclosed setting of the house obscures the view to and from Rossana House. The undulating parkland surrounding the house remains much as depicted on the historic OS mapping. There are several small gaps along the western boundary of the proposed development site, two farm access gates and one section of cut hedgerow. This is generally a wide field boundary of shrubbery with a high treeline that has formed the boundary of this field since at least the early 19th century. This part of the estate has functioned as a separate, enclosed field from at least the time of the first edition OS six-inch map of 1840.

Table 3 Protected structures within 500m of the proposed development site

<table>
<tr><th>RPS No.</th><th>NIAH Reg. No.</th><th>Name</th><th>ITM</th><th>Distance</th></tr>
<tr><td>25-14</td><td>16402509</td><td>Rossana House</td><td>727669, 696690</td><td>c. 395m NW</td></tr>
<tr><td colspan="5">Description (RPS): Important, early-18th Century, brick house remodelled in the early 19th Century. The façade is of five bays and three storeys with tall, roundheaded, ground-floor windows, a Greek-key string course and heavy cornice. The rear façade has a full height half-hexagon bow and a shallow bow. All sash windows have Georgian glazing-bars.

Description (NIAH): Detached five-bay three-storey country house, built in c. 1720. It is constructed in Flemish bond red brick. Part of the dwelling was demolished in c. 1950. To the rear (west) there are two, three-storey projecting bays, one canted and one bowed. To the east front, a replacement timber door surround has paired pilasters and a broken base pediment; it surrounds a part-glazed panelled door which is set within a semi-circular headed opening. Window openings have a mixture of semi-circular arched and flat-heads; all have timber sash windows which include six over six and three over three. The double-piled pitched roof is finished with natural slate and has cast-iron rainwater goods. The chimney stacks are rendered and have tall diagonally set flues with clay pots. The house is set within a well-wooded demesne. The remaining portion of this early 18th century house is substantially original.</td></tr>
</table>

6.2.2. National Inventory of Architectural Heritage (NIAH)

No additional sites are included within the NIAH within a 500m radius.

7. CULTURAL HERITAGE

7.1. Townlands and Toponomy

The name of Rossana Lower townland is derived from the Irish, *Ros Eanaigh*, meaning 'the wood of Eanna'. The earliest surviving reference to Rossana is in the Irish Patent Rolls of James I for the years 1603 to 1623 (logainm.ie).

There are no townland boundaries within the proposed development.

7.2. Folklore

No information relating to Rossana Lower / Upper townlands is available in the Schools' Collection by the Irish Folklore Commission (1937-39) (www.duchas.ie).

8. FIELD INSPECTION

The proposed site was inspected on 24th July 2023, on a dry bright day. It comprised one large field of short pasture. The field is undulating and slopes gently to the north/north-east. The M11 motorway bounds the field to the east, with modern fencing and mature vegetation along its boundary. Modern fencing also forms the boundary along the south, at the R772 road, which was realigned at the time of the motorway construction. Mature trees and shrubs separate this field from the remainder of the Rossana House estate. This originally formed part of the parkland of the Rossana estate and was part of a large, enclosed field at the eastern side of the demesne. The field retains no visible demesne landscaping features and no historic character. There was excellent ground surface visibility and no surface trace of any archaeological features.

There are some partial views from the proposed site into the adjacent parkland of Rossana House, at the two existing farm access gates and a small section of cut hedgerow. The parkland is undulating with mature specimens trees and short grass grazed by sheep. There are no expansive views and Rossana House (a protected structure) and its outbuildings are not visible. The house is nestled in a dip, enclosed by mature vegetation, and there is no intervisibility between the proposed site and the house or its associated outbuildings. The designed view was to the east / north-east and would not have included this part of the estate.

All of the current access gates are modern, with the exception of one located close to the north-western site boundary (c. 5m outside the site), where stone gate piers still stand either side of the farm gate. The piers are square in profile, c. 1.7m high (visible height) and c. 0.8m wide, and constructed of large granite ashlar blocks, partly engulfed in the overgrown vegetation along the field boundary. The capstones are not visible, being obscured by vegetation. There was evidence of modern cement repairs in both piers. A hole designed to house the original gate fixings was visible in the south pier. Any corresponding features in the north pier were likely removed or obscured by the modern repairs. The existing gate, which is early/mid-20th century in appearance, was a later addition. There did not appear to be any walls extending from the gate piers, however, the dense vegetation could be obscuring any such remains.

No other designated features of architectural heritage significance are located in proximity to the proposed site. Designated sites in the wider area (as noted in section 4.1) are all located on the opposite side of the motorway. The proposed site is well screened by the topography and the mature vegetation lining the motorway and in the landscape.

Plate 1 View NNE within proposed development site

Plate 2 View to south boundary from within the proposed development site

Plate 3 South boundary of site, from R772 road, facing WNW. Note the mature specimen trees within the demesne in contrast to the low shrubbery and hedgerow of the modern planting put in following the realignment of the road.

Plate 4 Historic parkland with mature specimen trees, viewed through an exiting access gap in the field boundary, facing WNW towards Rossana House

Plate 5 Stone gate piers in western field boundary to north of proposed development site

Plate 6 Detail of southern gate pier, showing drilled hole for original gate fixings

9. RESULTS OF GEOPHYSICAL SURVEY

A geophysical survey of the proposed development site, comprising detailed gradiometry survey, was carried out in November 2023 by J. M. Leigh Surveys Ltd (Detection Licence No. 23R0448). A summary of the results in provided here and the full report is contained in Appendix 4 (Leigh 2023). The main aim of the survey was to identify any geophysical responses that may represent the remains of unknown archaeological features within the application area.

None of the responses identified in the survey were interpreted as definite archaeology, but there were numerous discrete, small-scale anomalies (possible pits), as well as curvilinear and linear trends, for which a cautious archaeological interpretation is considered. These were as follows (see also Figure 13):

- Isolated responses recorded throughout the dataset (**4** on Figure 13) may represent more deeply buried ferrous debris. However, given the location of the recorded cremated pit burial (WI025-108), located to the east, an archaeological interpretation must also be considered. The responses may represent isolated pit-type features;
- Broad amorphous responses and curvilinear trends in the data (**1** on Figure 13) may represent spreads of material or shallow pit-type features. However, these have no clear archaeological pattern and so it is equally likely that they result from natural variations in the sub-soil. This is also the case for linear trends in the east and north of the dataset (**2** on Figure 13);
- Parallel linear trends in the south (**3** on Figure 13) are indicative of ploughing activity. It is possible this ploughing activity is associated with the recorded enclosure (WI025-106). However, this is speculative and the ploughing may be more recent in origin.

Figure 13 Summary interpretation of geophysical survey results (after Leigh 2023)

10. SUMMARY AND CONCLUSIONS

10.1. Archaeological Heritage

The proposed site is previously undeveloped, a greenfield site, with high archaeological potential. While there are no recorded archaeological sites within it, multiple archaeological sites and featureswere identified during archaeological investigations in advance of the construction of the M11 motorway where it runs alongside the proposed development site (Junction 16 interchange). None of these sites had any above-ground remains and all were previously unknown. The results of these excavations and the presence of other recorded monuments in the vicinity indicate that this area was part of a Bronze Age landscape and that there was also settlement here in the medieval period.

An urn burial and a cremated pit burial (SMR WI025-107 & -108) were excavated immediately east of, and in the former same field as, the proposed development site. Investigations here also identified a medieval enclosure, three post-medieval enclosures and a fourth enclosure of unknown date (SMR WI025-106). Two hut sites (SMR WI025-101 & -102), of possible Bronze Age date, were excavated c. 200m to the south / south-east. In addition, a mound (RMP WI025-007) and a ring-ditch (RMP WI025-036) are recorded within Rossana Demesne, c. 200m northwest of the proposed development site. The wider area was also occupied during the early medieval period, with a ringfort, associated enclosure, and field systems (RMP WI025-008, -009, -009001, -068) recorded in Newrath townland.

None of the responses identified in the geophysical survey within the proposed development site were interpreted as definite archaeology, but there were numerous discrete, small-scale anomalies (tentatively, possible pits), as well as curvilinear and linear trends, for which a cautious archaeological interpratation is considered.

10.2. Architectural Heritage

The proposed development site is located within the former demesne lands of the 18th century Rossana House, a protected structure (RPS 25-14). The post-medieval enclosures uncovered during the archaeological investigations at the M11 Junction 16 interchange are likely to represent ornamental landscape features associated with the demesne, much like the tree-ring to the north-east of the site that survived into the early 19th century and is depicted on the first edition OS six-inch map.

The historic character of the demesne west of the proposed development site survives largely intact, with parkland, mature specimen trees and areas of woodland. There is no intervisibility between Rossana House and the proposed development site, a result of the undulating topography and the siting of the protected structure in a natural dip, surrounded by mature trees.

The boundary between the surviving parkland and the field in which the proposed development site is located has been present since at least the early 19th century. The boundary to the estate along the present R772 road was altered at the time of the motorway construction, when the road was realigned and this section of the demesne and field boundary (at the south-east corner of the proposed development site) was replanted. While no historic features were noted within the site, a set of substantial granite-stone gate piers was observed just outside it to the north, at a farm access gate into the parkland. This speaks to the longevity of this boundary and its importance in the setting of the protected structure and the character of the historic grounds.

It is proposed to retain the majority of this boundary, with the only affected area being a short section at its southern end, where the proposed site access will be located. The site access will also require removal of part of the southern estate boundary at the R772 road. While the planting in this section is relatively new (the estate boundary was altered at the time of the road realignment), any further changes here could negatively affect the historic character of the demesne and thus the setting of the protected structure.

11. RECOMMENDATIONS

11.1. Archaeological Heritage

Archaeological testing will be required to confirm whether the anomalies identified by the geophysical survey within the proposed development site are archaeological in nature, and if so, to establish their nature, extent, and date. Testing will also provide a more detailed and clear assessment of the effect that the proposed development would have on archaeological material and allow for the development of a suitable mitigation strategy.

Archaeological testing was scheduled to be undertaken in early February 2024, on foot of a licence issued by the National Monuments Service (NMS) (Department of Housing, Local Government and Heritage (DHLGH)), following submission of a licence application and method statement (see Appendix 4). Last minute land access issues have resulted in a postponement of the testing.

The archaeological testing will take place as soon as permission from the landowner has been secured. This will take place well in advance of construction and under licence to the NMS (DHLGH). Should the anomalies identified in the geophysical survey prove to be archaeological in nature, these and any other archaeological features identified will be resolved in consultation with, and to the satisfaction of, the NMS (DHLGH) and the National Museum of Ireland.

Where full excavation of archaeological features has been agreed, the archaeologist will be afforded sufficient time and resources to record and remove any such features identified. Archaeological excavation ensures that the removal of any archaeological soils, features, finds and deposits is systematically and accurately recorded, drawn and photographed, providing a paper and digital archive and adding to the archaeological knowledge of a specified area (i.e. preservation by record).

Other methods of resolution that may be required by the NMS (DHLGH), depending on the nature of the archaeology revealed, include preservation in situ or preservation by design.

11.2. Architectural Heritage

It is recommended that the affected section of boundary between the proposed development site and the historic grounds of Rossana House, be replaced in a manner sympathetic to the setting. The landscape design for the proposed development should include a boundary treatment designed to enhance the character of the historic demesne that sits adjacent to the proposed Park and Ride site.

All recommendations are subject to approval from the National Monuments Service (NMS) of the Department of Housing, Local Government and Heritage (DHLGH) and the local planning authority who may make additional recommendations.

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APPENDIX 1 Summary of Archaeological Investigations and Recorded Monuments

Table 4 Previous archaeological investigations in the vicinity of the proposed development site

Licence No.	Excavations Ref.	Townland / Project	Results of investigations
01E0862	2001:1384	Rossana Lower / Testing N11 Newtownmountkennedy to Ballynabarny	Medieval / post-medieval – five enclosures, later excavated under 01E1073
01E1073	2001:1385 / 2002:1989	Rossana Lower / Excavation N11 Newtownmountkennedy to Ballynabarny	Bronze Age – urn burial, cremated pit burial and numerous hearths. Medieval / post-medieval – one 12tth-13th century enclosure, two bivallate post-medieval enclosures, one single-ditch post-medieval enlcouse and one enclosure of uncertain date. Upon excavation, only one of the five enclosures was confirmed as archaeological. From the recovered material it appears to date from the 12th–13th century. The two bivallate enclosures and one single-ditch enclosure were proved to be post-medieval and probably decorative ornamental features. Additional features found during the excavation included an urn burial, a cremated pit burial and numerous hearths.
02E0567	2004:1877	Milltown North / Excavation N11 Newtownmountkennedy to Ballynabarny	Hut sites of unknown date with unprovenanced flint artefacts. Site A – small enclosing ditch, field drains Site B – circular enclosing ditch and post-hole Site C – linear features and pits. Site A was a small crescent-shaped enclosing ditch. Two parallel linear field drains flanked it. Two other features were located to the east of the enclosure, while an oval pit with culturally sterile fill was just to the south-east of the enclosure. Site B consisted of a circular enclosing ditch, a possible post-hole at the base of the ditch and two outlying features of unknown function. The small huts indicated by the remains at Sites A and B are difficult to place chronologically. Flint artefacts were recovered from Site B, but it is not being suggested that this site, or Site A, date from the Mesolithic or Neolithic periods, or even to the Bronze Age. Each of the three sites reported on are simple in that they have few features or artefacts that would place them conclusively in a chronological setting. Site C was composed of two linear features with three associated pits. Two of the three associated pits were located at the terminus of the linear features. The larger of the two linear features began a short distance inside the land-take of the project and continued outside. It was the only feature in the site to contain archaeological material. All the other features identified appear to have been natural occurrences or the result of burned vegetation. Whether the burning was the result of cultural activities or natural events is unknown.
02E0703	2002:1979	Milltown North / Excavation N11 Newtownmountkennedy to Ballynabarny	Bronze Age – two ring-ditches, two urn burials, a possible cremation pit and associated pits. The site, which had been identified during monitoring of topsoil-stripping, consisted primarily of a large circular ring-ditch, with a second, much smaller ring-ditch to its north-east and various randomly scattered concentrations of pits to the north, east and south of these two features. It was c. 500m north of Monitoring Site 15 (the

Licence No.	Excavations Ref.	Townland / Project	Results of investigations
			ploughed-out remains of a fulacht fiadh (02E0542) and c. 500m south of Monitoring Site 13 (02E0547). Ring-ditch 1 was roughly circular, with an internal diameter of 7.4m and an external diameter of 10.5m. Cut into subsoil to a depth of 1m, the ditch was roughly U-shaped in section and c. 1.25m wide. Two urn burials were recorded in the interior of Ring-ditch 1. Both of these were excavated and removed with a conservator in attendance, in order to preserve as much of the original vessel as possible. The nature of the original pits and vessels was not fully evident at the time of excavation. Urn Burial 1 was in the north-western quadrant of the ring-ditch and appeared to be heavily truncated. It was contained in a pit, which was roughly circular and had a diameter of 0.35m. The pit, as excavated, was cut into subsoil to a depth of 0.2m. It contained a single fill, of a loose, mid-brown, silty clay. Fragments of pottery and burnt bone were recorded on the surface of the pit and extended east for c. 0.3m, forming a shallow spread, with a maximum depth of 0.01m. Urn Burial 2 was c. 0.5m east of Urn Burial 1. This feature had also been heavily truncated. The pit, as excavated, was roughly circular, with a diameter of 0.3m, and was cut into subsoil to a depth of 0.15m. It contained a single fill, a loose, mid-brown, silty clay. Both urn burials were removed for conservation. A possible cremation pit was also recorded within Ring-ditch 1. The pit, roughly oval, measured 0.43m north-east/south-west by 0.35m and was cut into subsoil to a depth of 0.11m. It contained a single fill, a loose, grey/black, silty clay with abundant charcoal flecking and burnt bone. Ring-ditch 2 was c. 8m north-east of Ring-ditch 1. Roughly circular, it had an internal diameter of 2.5m and an external diameter of 3.25m. The ditch was roughly U-shaped in section, with an average width of 0.3m, and was cut into subsoil to a depth of 0.3m. A narrow entrance was recorded to the north, with the terminals of the ditch defined by two possible post-holes. A series of post-holes was also noted encircling the exterior of the ring-ditch. An arc of small pits lay c. 24m east of Ring-ditch 2. The arc travelled through 180?, with the opening facing west, and consisted of five subsoil-cut pits, from which a number of flakes of struck flint and a fragment of Grooved Ware were recovered.

Table 5 Recorded monuments (RMP/SMR) within 700m of the proposed development site

RMP / SMR no.	Classification	Townland	ITM E	ITM N	Description
WI025-007	Mound	ROSSANA UPPER	727897	696642	Circular steep sided mound (diam. 21m, H. 3.70m) with level summit (diam. 6.8m). Level ground overlooking gentle NE slope to stream. Barrow (WI025-036) 120m SW.
WI025-008	Ringfort - unclassified	NEWRATH	728942	696474	Situated on level ground in gently undulating terrain, adjacent to traces of a field system (WI025-009). Bivallate enclosure defined by inner (diam. c. 25m) and outer (diam. c. 40m) fosses, visible as cropmarks on aerial photograph (CUCAP, AYJ 67). Not visible at ground level.
WI025-009	Field system	NEWRATH	728843	696315	Situated on level ground in gently undulating terrain. A possible field system, visible as cropmarks on aerial photograph (CUCAP, AYJ 67), consisting of part of a large field (est. max. dims. 80m x 70m), with another boundary abutting the NE corner (L c. 80m). Not visible at ground level. The cropmark of a bi-vallate enclosure (WI025-009001-) bisteced by a N-S field boundary is also visible on the aerial photograph. The

RMP / SMR no.	Classification	Townland	ITM E	ITM N	Description
					field system runs off this bi-vallate enclosure (WI025-009001-) with a second enclosure (WI025-008) 100m to the N.
WI025-009001	Enclosure	NEWRATH	728814	696365	Situated on level ground in gently undulating terrain. A possible field system, visible as cropmarks on aerial photograph (CUCAP, AYJ 67), consisting of part of a large field (est. max. dims. 80m x 70m), with another boundary abutting the NE corner (L c. 80m). Not visible at ground level. The cropmark of a bi-vallate enclosure (WI025-009001) bisteced by a N-S field boundary is also visible on the aerial photograph. The field system runs off this bi-vallate enclosure (WI025-009001) with a second enclosure (WI025-008) 100m to the N.
WI025-035	Castle - unclassified	MILLTOWN NORTH	727396	695499	Milltown castle, as it is called, stands in the townland of Milltown; measuring sixty-six feet in length by eighteen in breadth. The east end, about twenty six feet high remains, with a breach extending from the top half down, and the south wall remains entire to the height of about eighteen feet. The north wall and west gable are down. There is a round tower at the south west angle, nine feet diameter, the walls three feet thick and about twenty eight feet high, having six loopholes, with a window on the south side about six feet high, two feet broad and fifteen feet from the ground.' (OS Letters, 250). There is a round tower at the south west angle, nine feet diameter, the walls three feet thick and about twenty eight feet high, having six loopholes, with a window on the south side about six feet high, two feet broad and fifteen feet from the ground. This cannot be one of the Anglo Norman castle but one of the Elizabethan houses probably" (Corlett & Medlycott 2001, 79).
WI025-036	Ring-ditch	ROSSANA UPPER	727803	696574	Situated on level ground 120m SW of a tumulus (WI025-007). Level circular area (diam. 11.5m) defined by a shallow fosse (Wth 1.7-1.9m; D 0.2m).
WI025-050	Habitation site	MOUNTUSHER	727621	697318	Archaeological monitoring (Licence No. 02E1547) of topsoil-stripping revealed several spreads of charcoal covering an area of 15m by 15m, containing several small post-holes and a pit (Bennett 2004, 539)
WI025-051	Ring-ditch	MOUNTUSHER	727732	697136	Archaeological excavation (Licence No. 02E1434) revealed a circuar area (int. diam. 14.5m; ext. diam. 18.8m) defined by a ditch (Wth 4m; D 0.4-0.7m). The interior contained a post-hole structure and three urn burials. A fourth urn burial had been placed just outside the SW edge of the ditch (Bennett 2004, 538).
WI025-052	Ring-ditch	MILLTOWN NORTH	727941	695617	Archaeologically excavated (Licence No. 02E0703) as 'Site 14 Milltown North'. Two circular, closely associated ring-ditches; the larger (designated WI025-052----) (int. diam. 7.4m; ext. diam. 10.5m) was defined by a U-shaped ditch (Wth 1.25m). The interior contained two urn burials and a possible cremation pit. The second, much smaller ring-ditch (designated WI025-052001-) lay c.8m to the NE (int. diam 2.5m; ext. diam. 3.25m) and was also defined by a U-shaped fosse (Wth 0.3m) and had an outer ring of post-holes. An entrance at the N was defined by two post holes. An arc of five small pits lay c.24m to the E and produced some struck flint and a fragment of Grooved Ware (Bennett 2004, 537).
WI025-052001	Ring-ditch	MILLTOWN NORTH	727941	695617	Archaeologically excavated (Licence No. 02E0703) as 'Site 14 Milltown North'. Two circular, closely associated ring-ditches; the larger (designated WI025-052----) (int. diam. 7.4m; ext. diam. 10.5m) was defined by a U-shaped ditch (Wth 1.25m). The interior contained two urn burials and a possible cremation pit. The second, much smaller ring-ditch (designated WI025-052001-) lay c.8m to the NE (int. diam 2.5m; ext. diam. 3.25m) and was also defined by a U-shaped fosse (Wth 0.3m) and had an outer ring of post-

RMP / SMR no.	Classification	Townland	ITM E	ITM N	Description
					holes. An entrance at the N was defined by two post holes. An arc of five small pits lay c.24m to the E and produced some struck flint and a fragment of Grooved Ware (Bennett 2004, 537).
WI025-053	Burnt mound	BALLYBEG (Newcastle By.)	727854	695419	Archaeological excavation (Licence No. 02E0542) revealed two large spreads of burnt mound material extending along the S bank of the Rathnew River, with two large 'trough features', pits and stake-holes between them (Bennett 2004, 525-6)
WI025-058	Excavation – misc.	MILLTOWN NORTH	727883	695505	An area of improved grassland was stripped of topsoil before the construction of the new N11 road. It was chosen because of its location, overlooking a small, unnamed stream that flowed along its southern boundary. The area was tested by a series of mechanically excavated trenches. These uncovered a number of possible areas of archaeological activity. Subsequent excavation of these features revealed most to be either modern or natural. However, two pits produced sherds of prehistoric pottery, possibly Western Neolithic. The field was then subjected to monitored topsoil-stripping, which revealed a range of pits and gullies. As with the testing, many of these features proved to be of limited archaeological significance. None of the features appeared to form a discernible pattern (Bennett 2004, 525).
WI025-068	Field system	NEWRATH	728657	696614	Visible on aerial photographs taken by M. Moore (16-07-06) as the cropmark of two, small, sub-rectangular fields orientated N-S, in tillage.
WI025-096	Excavation – misc.	INCHANAPPA SOUTH	727542	697276	Five areas of archaeological activity were noted here during archaeological test trenching in 2005 (Excavation Licence 05E1193, Site 7). 'These generally represent area of burning and may be associated with domestic/industrial activity. Fragments of burnt bone were found throughout the features. Fragmented prehistoric pottery and some slag were also identified.' (Delaney 2005, 13).
WI025-097	Excavation – misc.	INCHANAPPA SOUTH	727393	697166	Thirteen areas of archaeological activity were noted here during archaeological test trenching in 2005 (Excavation Licence 05E1193, Site 8). 'These generally represent area of burning and may be associated with domestic/industrial activity. Fragments of burnt bone were found throughout the features. Fragmented prehistoric pottery and some slag were also identified.' (Delaney 2005, 13).
WI025-101	Hut site	MILLTOWN NORTH	728069	695994	A 'small crescent-shaped enclosing ditch' was excavated here (Excavation Licence 02E0567 (site A)) prior to the construction of the dual carriageway (Kieran 2007, 487).
WI025-102	Hut site	MILLTOWN NORTH	728033	695951	A small hut site was excavated here in 2002 (Excavation Licence 02E0567 (site B)) prior to the construction of the dual carriageway. (Kieran 2007, 487)
WI025-103	Excavation – misc.	MILLTOWN NORTH	727990	695764	Two linear features with three associated pits' were excavated here in 2002 (Excavation Licence 02E0567 (site C)) prior to the construction of the dual carriageway. (Kieran 2007, 487)
WI025-106	Enclosure	ROSSANA LOWER	728087	696334	An enclosure of possible 12-13th century date (WI025-106), an urn burial (WI025-107), a cremated pit burial (WI025-108) and numerous hearths were excavated here in 2001-2002 (Excavation Licence 01E1073) as part of construction work associated with the N11 roadway. (Kieran 2004, 541)
WI025-107	Urn burial	ROSSANA LOWER	728087	696334	An enclosure of possible 12-13th century date (WI025-106), an urn burial (WI025-107), a cremated pit burial (WI025-108) and numerous hearths were excavated here in 2001-2002 (Excavation Licence 01E1073) as part of construction work associated with the N11 roadway. (Kieran 2004, 541)
WI025-108	Cremation pit	ROSSANA LOWER	728087	696334	An enclosure of possible 12-13th century date (WI025-106), an urn burial (WI025-107), a cremated pit burial (WI025-108) and numerous hearths were excavated here in 2001-2002 (Excavation Licence 01E1073) as part of construction work associated with the N11 roadway. (Kieran 2004, 541)

APPENDIX 2 Relevant Legislation

The **Historic and Archaeological Heritage and Miscellaneous Provisions Act 2023** was enacted in October 2023 and this this Act is now law. The Minister for Housing, Local Government and Heritage commenced certain provisions in May 2024 (S.I. No. 252/2024), however until the Act is fully commenced, the National Monuments Acts have therefore not yet been repealed and remain in force.

National Monuments Legislation (1930-2004)

The National Monument Act, 1930 (as amended) provides the formal legal mechanism to protect monuments in Ireland. Protection of a monument is provided via:

Record of Monuments and Places (RMP);

National Monument in the ownership or guardianship of the Minister for Arts, Heritage, Regional, Rural & Gaeltacht Affairs or a Local Authority;

National Monument subject to a Preservation Order (or temporary Preservation Order);

Register of Historic Monuments (RHM).

The definition of a monument is specified as:

any artificial or partly artificial building, structure or erection or group of such buildings, structures or erections;

any artificial cave, stone or natural product, whether forming part of the ground, that has been artificially carved, sculptured or worked upon or which (where it does not form part of the place where it is) appears to have been purposely put or arranged in position;

any, or any part of any, prehistoric or ancient tomb, grave or burial deposit, or (ii) ritual, industrial or habitation site; and

any place comprising the remains or traces of any such building, structure or erection, any cave, stone or natural product or any such tomb, grave, burial deposit or ritual, industrial or habitation site.

Under Section 14 of the Principal Act (1930):

It shall be unlawful...

to demolish or remove wholly or in part or to disfigure, deface, alter, or in any manner injure or interfere with any such national monument without or otherwise than in accordance with the consent hereinafter mentioned (a licence issued by the Office of Public Works National Monuments Branch),

or

to excavate, dig, plough or otherwise disturb the ground within, around, or in the proximity to any such national monument without or otherwise than in accordance...

Under Amendment to Section 23 of the Principal Act (1930):

A person who finds an archaeological object shall, within four days after the finding, make a report of it to a member of the Garda Síochána...or the Director of the National Museum...

The latter is of relevance to any finds made during a watching brief.

In the 1994 Amendment of Section 12 of the Principal Act (1930), all the sites and 'places' recorded by the Sites and Monuments Record of the Office of Public Works are provided with a new status in law. This new status provides a level of protection to the listed sites that is equivalent to that accorded to 'registered' sites [Section 8(1), National Monuments Amendment Act 1954] as follows:

The Commissioners shall establish and maintain a record of monuments and places where they believe there are monuments and the record shall be comprised of a list of monuments and such places and a map or maps showing each monument and such place in respect of each county in the State.

The Commissioners shall cause to be exhibited in a prescribed manner in each county the list and map or maps of the county drawn up and publish in a prescribed manner information about when and where the lists and maps may be consulted.

In addition, when the owner or occupier (not being the Commissioners) of a monument or place which has been recorded, or any person proposes to carry out, or to cause or permit the carrying out of, any work at or in relation to such monument or place, he shall give notice in writing of his proposal to carry out the work to the Commissioners and shall not, except in the case of urgent necessity and with the consent of the Commissioners, commence the work for a period of two months after having given the notice.

The National Monuments Amendment Act enacted in 2004 provides clarification in relation to the division of responsibilities between the Minister of Environment, Heritage and Local Government, Finance and Arts, Sports and Tourism together with the Commissioners of Public Works. The Minister of Environment, Heritage and Local Government will issue directions relating to archaeological works and will be advised by the National Monuments Section and the National Museum of Ireland. The Act gives discretion to the Minister of Environment, Heritage and Local Government to grant consent or issue directions in relation to road developments (Section 49 and 51) approved by An Bord Pleanála and/or in relation to the discovery of National Monuments.

14A. (1) The consent of the Minister under section 14 of this Act and any further consent or licence under any other provision of the National Monuments Acts 1930 to 2004 shall not be required where the works involved are connected with an approved road development.

14A. (2) Any works of an archaeological nature that are carried out in respect of an approved road development shall be carried out in accordance with the directions of the Minister, which directions shall be issued following consultation by the minister with the Director of the National Museum of Ireland.

Subsection 14A (4) Where a national monument has been discovered to which subsection (3) of this section relates, then the road authority carrying out the road development shall report the discovery to the Minister subject to subsection (7) of this section, and pending any directions by the Minister under paragraph (d) of this subsection, no works which would interfere with the monument shall be carried out, except works urgently required to secure its preservation carried out in accordance with such measures as may be specified by the Minister.

The Minister will consult with the Director of the National Museum of Ireland for a period not longer than 14 days before issuing further directions in relation to the national monument.

The Minister will not be restricted to archaeological considerations alone, but will also consider the wider public interest.

Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 1999

This Act provides for the establishment of a national inventory of architectural heritage and historic monuments.

Section 1 of the act defines “architectural heritage” as:

(a) all structures and buildings together with their settings and attendant grounds, fixtures and fittings,

(b) groups of such structures and buildings, and,

(c) sites

which are of architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest.

Section 2 of the Act states that the Minister (for Arts, Heritage, Gaeltacht and the Islands) shall establish the NIAH, determining its form and content, defining the categories of architectural heritage, and specifying to which category each entry belongs. The information contained within the inventory will be made available to planning authorities, having regard to the security and privacy of both property and persons involved.

Section 3 of the Act states that the Minister may appoint officers, who may in turn request access to premises listed in the inventory from the occupiers of these buildings. The officer is required to inform the occupier of the building why entry is necessary, and in the event of a refusal, can apply for a warrant to enter the premises.

Section 4 of the Act states that obstruction of an officer or a refusal to comply with requirements of entry will result in the owner or occupier being guilty of an offence.

Section 5 of the Act states that sanitary authorities who carry out works on a monument covered by this Act will as far as possible preserve the monument with the proviso that its condition is not a danger to any person or property, and that the sanitation authority will inform the Minister that the works have been carried out.

The provisions in the Act are in addition to and not a substitution for provisions of the National Monument Act (1930–94), and the protection of monuments in the National Monuments Act is extended to the monuments covered by the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act (1999).

APPENDIX 3 Relevant extracts of the Wicklow County Development Plan (2022-2028)

Archaeology Objectives

CPO 8.1 To secure the preservation of all archaeological monuments included in the Record of Monuments and Places as established under Section 12 of the National Monuments (Amendment) Act, 1994, and of sites, features and objects of archaeological interest generally. In the development management process, there will be a presumption of favour of preservation in-situ or, as a minimum, preservation by record. In securing such preservation the planning authority will have regard to the advice and recommendations of the National Monuments Service of the Department of Culture, Heritage and the Gaeltacht.

CPO 8.2 No development in the vicinity of a feature included in the Record of Monuments & Places (RMP) or any other site of archaeological interest will be permitted which seriously detracts from the setting of the feature or which is seriously injurious to its cultural or educational value.

CPO 8.3 Any development that may, due to its size, location or nature, have implications for archaeological heritage (including both sites and areas of archaeological potential / significance as identified in Schedules 08.01 & 08.02 and Maps 8.01 & 8.02 of this plan) shall be subject to an archaeological assessment.

CPO 8.4 To require archaeological assessment for all developments with the potential to impact on the archaeological heritage of riverine, intertidal or sub tidal environments.

CPO 8.5 To facilitate public access to National Monuments in State or Local Authority care, as identified in Schedule 08.02 and Map 8.02 of this plan.

CPO 8.6 To protect the integrity of Baltinglass Hills archaeological landscape including identified monuments and their wider setting by resisting development that may adversely impact upon the significance and understanding of this important landscape.

CPO 8.7 To support the inscription of Glendalough to Ireland's tentative UNESCO World Heritage Site list and promote a conservation led approach to facilitating visitor access and enjoyment of this internationally significant landscape.

CPO 8.8 To protect and promote the characteristics of historic towns in County Wicklow identified as zones of archaeological potential in the Record of Monuments and Places (RMP), ensuring that cognisance is given in relevant development proposals to retaining existing street layout, historic building lines and traditional plot widths where these derive from medieval or earlier origins.

CPO 8.9 To protect and promote the conservation of historic burial grounds (those that are generally no longer in use but which may contain sites and features on the Record of Monuments and Places (RMP) and/or RPS) and support greater public access to these where possible.

Architectural Heritage Objectives

CPO 8.10 To protect, conserve and manage the built heritage of Wicklow and to encourage sensitive and sustainable development to ensure its preservation for future generations.

CPO 8.11 To support the work of the National Inventory of Architectural Heritage (NIAH) in collecting data relating to the architectural heritage, including the historic gardens and designed landscapes, of the County, and in the making of this information widely accessible to the public, and property owners.

CPO 8.12 To have regard to 'Architectural Heritage Protection: Guidelines for Planning Authorities' (Department of Arts, Heritage and the Gaeltacht, 2011) in the assessment of proposals affecting architectural heritage.

Record of Protected Structures Objectives

CPO 8.13 To ensure the protection of all structures, items and features contained in the Record of Protected Structures.

CPO 8.14 To positively consider proposals to alter or change the use of protected structures so as to render them viable for modern use, subject to architectural heritage assessment and to demonstration by a suitably qualified Conservation Architect / or other relevant expertise that the structure, character, appearance and setting will not be adversely affected and suitable design, materials and construction methods will be utilised.

CPO 8.15 All development works on or at the sites of protected structures, including any site works necessary, shall be carried out using best heritage practice for the protection and preservation of those aspects or features of the structures / site that render it worthy of protection.

CPO 8.16 To support the re-introduction of traditional features on protected structures where there is evidence that such features (e.g. window styles, finishes etc) previously existed.

CPO 8.17 To strongly resist the demolition of protected structures or features of special interest unless it can be demonstrated that exceptional circumstances exist. All such cases will be subject to full heritage impact assessment and mitigation.

Other Structures & Vernacular Architecture Objectives

CPO 8.18 To seek (through the development management process) the retention, conservation, appropriate repair and reuse of vernacular buildings and features such as traditional dwellings and outbuildings, historic shopfronts, thatched roofs and historic features such as stonewalls and milestones. The demolition of vernacular buildings will be discouraged.

CPO 8.19 Development proposals affecting vernacular buildings and structures will be required to submit a detailed, true measured survey, photographic records and written analysis as part of the planning application process.

CPO 8.20 Where an item or a structure (or any feature of a structure) is considered to be of heritage merit (where not identified in the RPS3), the Planning Authority reserves the right to refuse permission to remove or alter that structure / item, in the interests of the protection of the County's architectural heritage.

Architectural Conservation Area Objectives

CPO 8.21 Within Architectural Conservation Areas, all those buildings, spaces, archaeological sites, trees, street furniture, views and other aspects of the environment which form an essential part of their character, as set out in their character appraisals, shall be considered for protection. The repair and refurbishment of existing buildings within the ACA will be favoured over demolition/new build in so far as practicable.

CPO 8.22 The design of any development in Architectural Conservation Areas, including any changes of use of an existing building, should preserve and / or enhance the character and appearance of the Architectural Conservation Area as a whole. Schemes for the conservation and enhancement of the character and appearance of Architectural Conservation Areas will be promoted. In consideration of applications for new buildings, alterations and extensions affecting Architectural Conservation Areas, the following principles will apply:

- Proposals will only be considered where they positively enhance the character of the ACA.

- The siting of new buildings should, where appropriate retain the existing street building line.

- The mass of the new building should be in scale and harmony with the adjoining buildings, and the area as a whole, and the proportions of its parts should relate to each other, and to the adjoining buildings.

- Architectural details on buildings of high architectural value should be retained wherever possible. Original features, which are important to a building's character such as window type, materials, detailing, chimneys, entrances and boundary walls, both within and outside the architectural conservation area should be retained where possible.

- A high standard of shopfront design relating sympathetically to the character of the building and the surrounding area will be required.

- The materials used should be appropriate to the character of the area. Planning applications in ACAs should be in the form of detailed proposals, incorporating full elevational treatment and colours and materials to be used.

- Where modern architecture is proposed within an ACA, the application should provide details (drawings and/or written detail) on how the proposal contributes to, or does not detract from the attributes of the ACA. CPO 8.23 To consider the designation of further ACAs for towns and villages in County Wicklow, when preparing future local plans, and as deemed appropriate.

CPO 8.24 To establish, where it is considered appropriate, "Areas of Special Planning Control", if it is considered that all or part of an Architectural Conservation Area is of special importance to the civic life or the architectural, historical, cultural or social character of a town or village in which it is situated. 3 The National Inventory of Architectural Heritage can sometimes be utilised as a source of information with regard to the architectural value of any such items or structures.

Historical and Cultural Heritage Objectives

CPO 8.25 To protect and facilitate the conservation of structures, sites and objects which are part of the County's distinct local historical and cultural heritage, whether or not such structures, sites and objects are included on the RPS.

CPO 8.26 To facilitate access to and appreciation of areas of historical and cultural heritage, through the development of appropriate trails and heritage interpretation, in association with local stakeholders and site landowners, having regard to the public safety issues associated with such sites.

CPO 8.27 To facilitate future community initiatives to increase access to and appreciation of railway heritage, through preserving the routes of former lines free from development.

CPO 8.28 Any road or bridge improvement works along the Military Road shall be designed and constructed with due regard to the history and notable features of the road (in particular its original support structures, route and alignment), insofar as is possible and reasonable given the existing transport function of the road.

APPENDIX 4 Method Statement for Archaeological Testing and Licence Issued by DHLGH

Method statement to accompany a licence application for archaeological testing in advance of planning for the proposed Ashford Park and Ride

Applicant: Liam Coen
Date: 11 December 2023
c/o Courtney Deery Heritage Consultancy, Lynwood House, Ballinteer Road, Dublin 16
lcoen@courtneydeery.ie

1. INTRODUCTION

An archaeological licence is being sought to undertake test excavations in advance of a planning application for a proposed Park and Ride at Junction 16, M11 Motorway, in County Wicklow. Test excavations are proposed to investigate geophysical survey results (Leigh,2023, Licence No. 23R0448) undertaken as part of these pre-planning archaeological works. None of the responses identified in the survey were interpreted as definite archaeology, but there were numerous discrete, small-scale anomalies (possible pits), as well as curvilinear and linear trends, for which a cautious archaeological interpretation is considered. Moreover, there is a high archaeological potential within the area with 21 recorded sites within 1km of the development, including a known urn burial and cremation pit (WI025-107, -108) directly adjacent to the eastern boundary of the proposed development.

Archaeological testing will be required to establish the nature, extent, and date of the possible archaeological features identified by the geophysical survey within the proposed development site. Testing will also provide a more detailed and clear assessment of the effect that the proposed development would have on archaeological material and allow for the development of a suitable mitigation strategy.

2. SITE LOCATION

The proposed Park and Ride location is situated in the lands surrounding Junction 16 on the M11, in the townland of Rossana Lower, in the civil parish of Rathnew, in the Barony of Newcastle, County Wicklow. The proposed development site is previously undeveloped, a greenfield site, and has a level of high archaeological potential. While there are no recorded archaeological sites within it, multiple archaeological sites and features were identified during archaeological investigations in advance of the construction of the M11 motorway where it runs alongside the proposed development site, including an urn burial, cremation burial, and medieval enclosure.

The proposed development site is located within the former demesne lands of the 18th century Rossana House, a protected structure (RPS 25-14). The historic character of the demesne west of the proposed development site survives largely intact, with parkland, mature specimen trees and areas of woodland. There is no intervisibility between Rossana House and the proposed development site, a result of the undulating topography and the siting of the protected structure in a natural dip, surrounded by mature trees.

Figure 1: Site location (in red)

3. THE DEVELOPMENT

The proposed development layout comprises a car park with 210 parking spaces, including 13 designated for users with mobility impairments, 21 for electric vehicles, and an additional 21 spaces future-proofed for electric vehicles. The proposal entails the installation of fencing, kerbs, drainage, road markings, public lighting, CCTV, ticketing machines, as well as a new ESB substation and switch room. Additionally, the proposal includes the provision of active travel connections and hardstanding areas for bike shelters and lockers. The scheme also incorporates an area with two bus bays, two passenger shelters, and a dedicated bus turning circle within the site. A new all-movement uncontrolled access junction is proposed at R772 to provide access to the facility that will feature a newly added right-turning pocket lane, achieved by widening the carriageway.

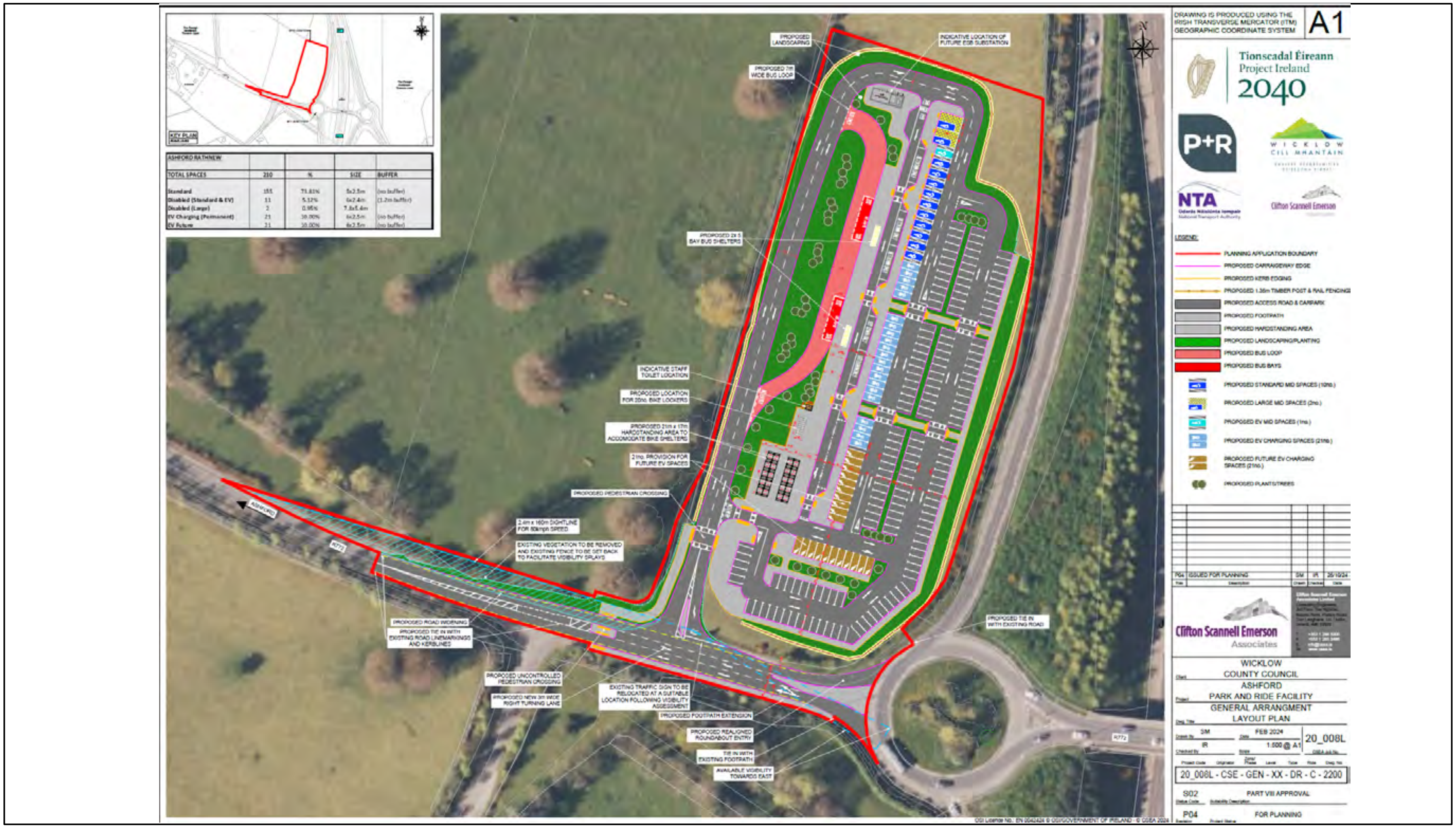


Figure 2: Proposed site layout

ARCHAEOLOGICAL BACKGROUND

A detailed archaeological and historical background including cartographic analysis is provided in Appendix 1 of this Method Statement.

There are no RMP / SMR sites within the proposed development site. There are 21 recorded within a 1km radius. Twelve of these were identified during archaeological investigations in advance of the M11 motorway construction and have been fully excavated, with 11 not scheduled for inclusion in the next revision of the RMP (see Table 2).

The excavated sites include the three recorded sites closest to the proposed development boundary. WI025-106 is recorded as simply 'enclosure' though in fact five enclosures were excavated in this area. While some of the enclosures excavated proved to be post-medieval in date – presumably related to landscape design in Rossana demesne – one was medieval. As there was also an urn burial and cremation pit (WI025-107, -108), this points to settlement and activity in the immediate area during the Bronze Age and the medieval period.

The remaining sites include a mound and ring-ditch recorded within Rossana Demesne in the parkland east / south-east of the house (RMP WI025-007, -036), providing further evidence of Bronze Age activity in the lands south of the River Vartry. There are also indications of continuity of settlement in this landscape, with sites of likely early medieval date recorded in Newrath townland to the east, comprising a ringfort, enclosure, and two field systems (RMP WI025-008, -009, -009001, -068), an unclassified castle site in Milltown North (WI025-035), and further prehistoric activity recorded north and south along the Motorway.

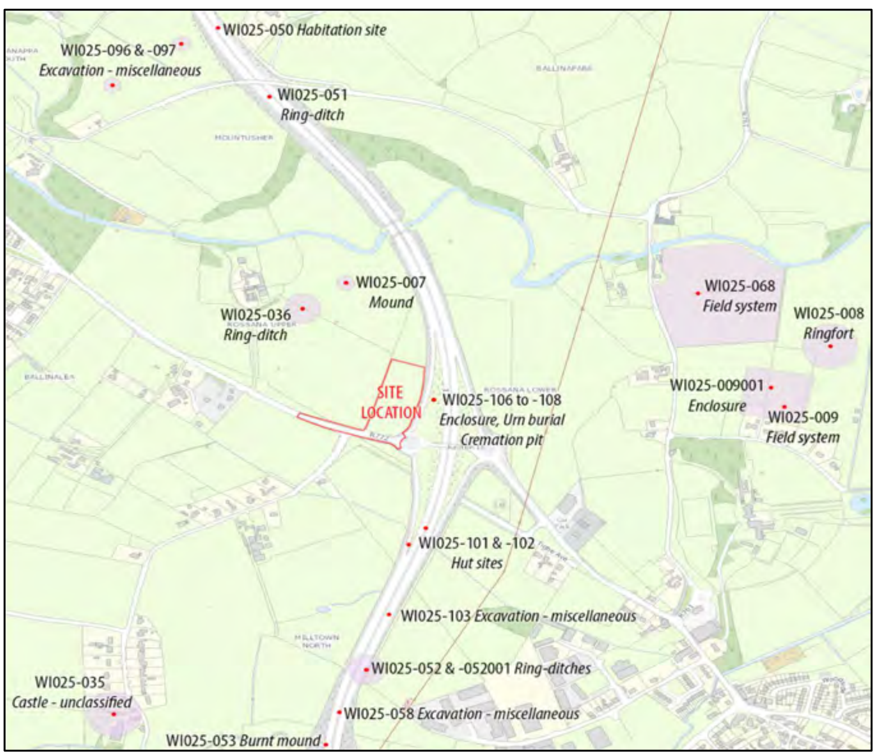


Figure 3 RMP / SMR sites within 1km of proposed development site

Table 1: Table Indicating known RMP/SMR sites within the vicinity of the development

RMP / SMR No.	Classification	Scheduled for inclusion in RMP update	Townland	ITM E	ITM N	Distance
WI025-007	Mound	Yes	ROSSANA UPPER	727897	696642	c. 200m NW
WI025-008	Ringfort - unclassified	Yes	NEWRATH	728942	696474	c. 820m ENE
WI025-009	Field system	Yes	NEWRATH	728843	696315	c. 685m E
WI025-009001	Enclosure	Yes	NEWRATH	728814	696365	c. 685m E
WI025-035	Castle - unclassified	Yes	MILLTOWN NORTH	727396	695499	c. 895m SW
WI025-036	Ring-ditch		ROSSANA UPPER	727803	696574	c. 190m WNW
WI025-050	Habitation site	No	MOUNTUSHER	727621	697318	c. 935m NW
WI025-051	Ring-ditch	No	MOUNTUSHER	727732	697136	c. 730m NW
WI025-052	Ring-ditch	No	MILLTOWN NORTH	727941	695617	c. 920m
WI025-052001	Ring-ditch	Yes	MILLTOWN NORTH	727941	695617	c. 615m S
WI025-053	Burnt mound	No	BALLYBEG (Newcastle By.)	727854	695419	c. 825m S
WI025-058	Excavation – misc.	No	MILLTOWN NORTH	727883	695505	c. 730m S
WI025-068	Field system	Yes	NEWRATH	728657	696614	c. 535m ENE
WI025-096	Excavation – misc.	Yes	INCHANAPPA SOUTH	727542	697276	c. 930m NW
WI025-097	Excavation – misc.	Yes	INCHANAPPA SOUTH	727393	697166	C. 950 NW
WI025-101	Hut site	No	MILLTOWN NORTH	728069	695994	c. 205m SSE
WI025-102	Hut site	No	MILLTOWN NORTH	728033	695951	c. 240m SSE
WI025-103	Excavation – misc.	No	MILLTOWN NORTH	727990	695764	c. 430m SSE
WI025-106	Enclosure	No	ROSSANA LOWER	728087	696334	Adjacent to E
WI025-107	Urn burial	No	ROSSANA LOWER	728087	696334	Adjacent to E
WI025-108	Cremation pit	No	ROSSANA LOWER	728087	696334	Adjacent to E

GEOPHYSICAL SURVEY

A geophysical survey of the proposed development site, comprising detailed gradiometry survey, was carried out in November 2023 by J. M. Leigh Surveys Ltd (Detection Licence No. 23R0448). A summary of the results in provided here. The primary aim of the survey was to identify any geophysical responses that may represent the remains of unknown archaeological features within the proposed development area.

None of the responses identified in the survey were interpreted as definite archaeology, but there were numerous discrete, small-scale anomalies (possible pits), as well as curvilinear and linear trends, for which a cautious archaeological interpretation is considered. These were as follows (see also Figure 4):

- Isolated responses recorded throughout the dataset may represent more deeply buried ferrous debris. However, given the location of the recorded cremated pit burial (WI025-108), located to the east, an archaeological interpretation must also be considered. The responses may represent isolated pit-type features;
- Broad amorphous responses and curvilinear trends in the data may represent spreads of material or shallow pit-type features. However, these have no clear archaeological pattern and so it is equally likely that they result from natural variations in the sub-soil. This is also the case for linear trends in the east and north of the dataset;
- Parallel linear trends in the south (**3** on Figure 4) are indicative of ploughing activity. It is possible this ploughing activity is associated with the recorded enclosure (WI025-106). However, this is speculative and the ploughing may be more recent in origin.

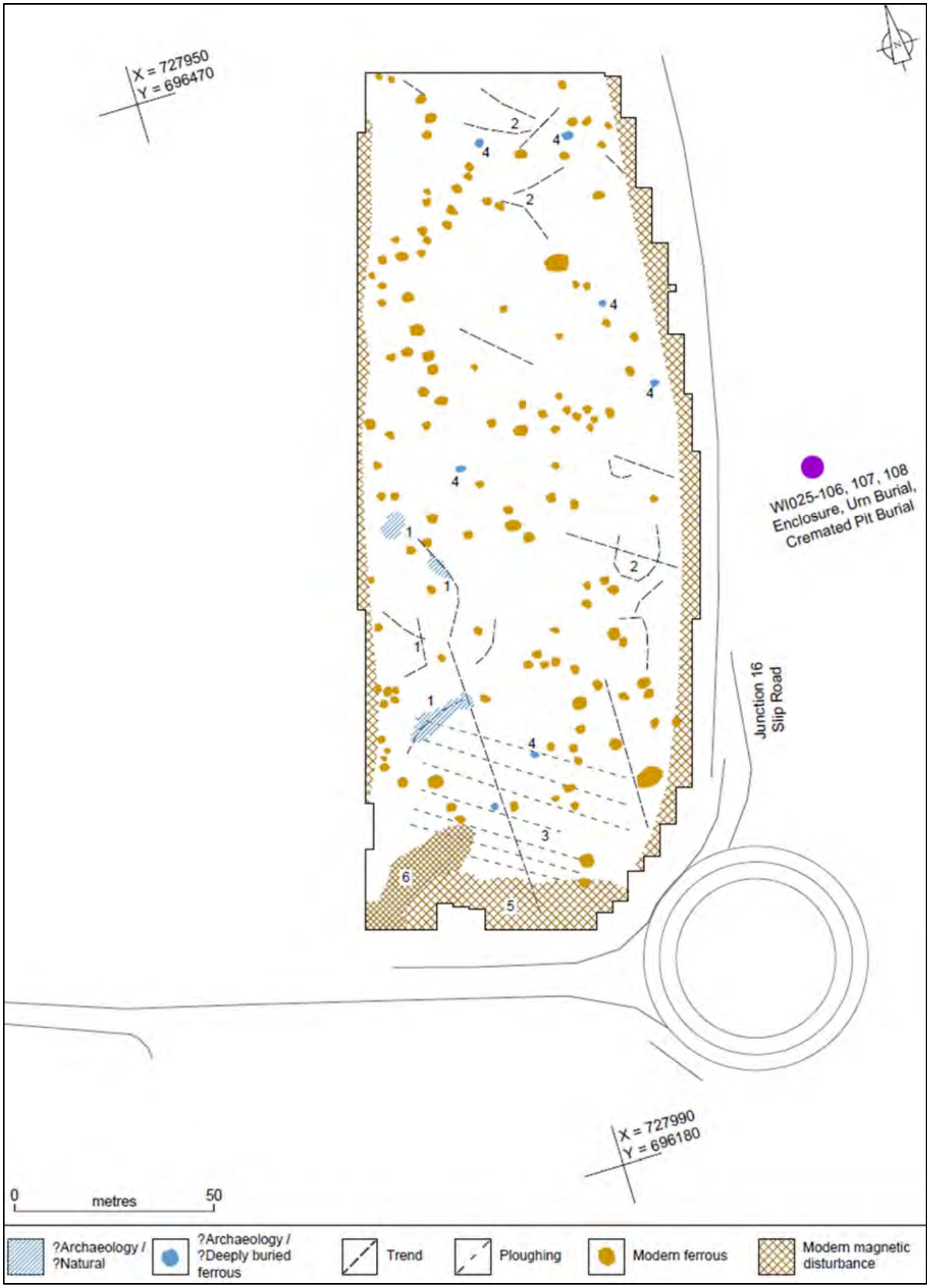


Figure 4 Summary interpretation of geophysical survey results (after Leigh 2023)

4. PROJECT STRATEGY

Archaeological testing under licence will be carried out with the use of a tracked machine fitted with a flat bucket/ toothless grading bucket under the direction of the licensed archaeologist. All trenches will be excavated with the use of a mechanical excavator to the surface of archaeological deposits or to the underlying natural subsoil, whichever is encountered first.

Test excavation is required in order to clarify the nature, size and extent of the below ground geophysical anomalies, as this will inform the final design layout. This will provide information on the depth at which the possible archaeological features occur. Further investigation is also taking place in order to assess if mitigation by design can be achieved where avoidance is not possible.

The test trenches have been targeted to investigate anomalies detected by the geophysical survey results or where interpretation was unclear due to the underlying geological, soil formations and disturbance. Test trenches will be located within the surveyed area, including where aerial results suggests potential features. Additionally, there will be a test trench dug within an area where the geophysical survey did not detect any anomalies in order to determine the baseline, and to test the veracity of the geophysical results.

Where the geophysical features are of uncertain archaeological potential, testing is taking place to create a better understanding of the archaeological potential and the extent and nature of the feature.

9 trenches are to be excavated across the proposed development site. Depending on the results, trenches may be extended, or additional ones placed in certain areas in order to further determine the nature and extent of subsurface remains. It is anticipated that the test excavation will take 2-3 days to complete.

In the event that archaeological remains are discovered during testing, limited sections will be investigated by hand to determine their nature and extent and they will be recorded by photographs, scaled drawings, and recording sheets. Any identified archaeological remains will be covered with a suitable membrane before backfilling. Trenches will be surveyed using GPS.

In the event of significant archaeological features being identified the Department will advise on any remedial action it considers appropriate.

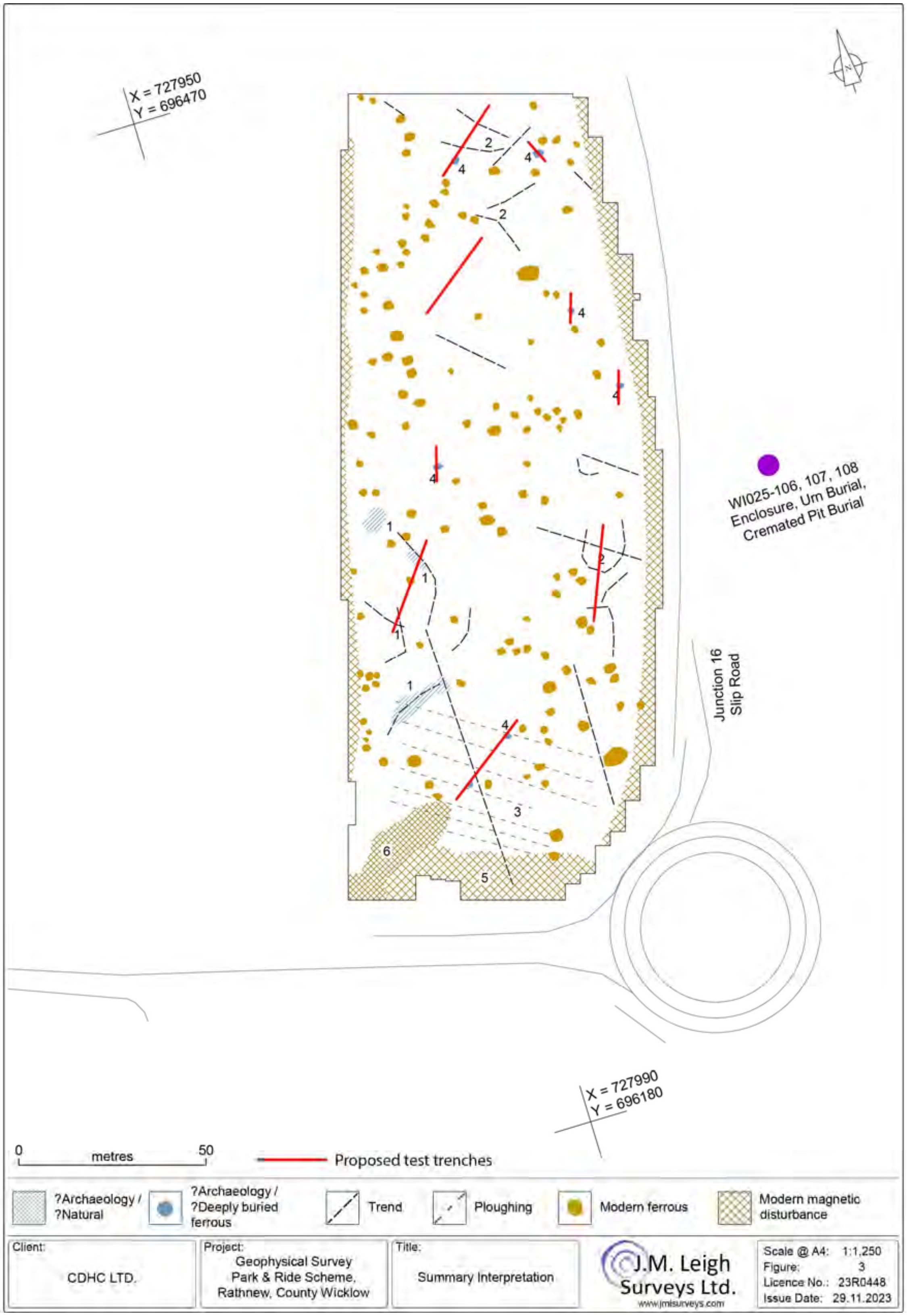


Figure 5: Proposed test trench locations

5. FINDS RETRIEVAL

Finds will be retrieved through visual inspection of exposed surfaces, test trench spoil and during hand excavation. Any finds will be recorded by location and context, individually bagged where necessary, catalogued and given a finds number. Where deemed necessary on-site dry sieving of soil for the purpose of finds retrieval will be employed. Find numbers will be assigned and labels applied to finds in line with the NMI 'Standards for the care and treatment of archaeological objects from excavations'. The NMI will be consulted in the case of there being doubts as to what constitutes an archaeological object worthy of retention. The discovery of human remains will be reported as soon as possible to the NMS and the NMI. All finds will be stored in secure storage at the offices of Courtney Deery Heritage Consultancy during post excavation works and ultimately will be forwarded to the National Museum of Ireland.

6. PROJECT TEAM

The testing team will comprise one archaeological licensed director (Liam Coen) and one archaeological assistant.

7. SAMPLING STRATEGY

It is not anticipated that any bulk soil samples will be collected during the course of test excavations. If exceptional circumstances warrant it, then strategic sampling will be employed with a view to gathering environmental material for dating and environmental analyses, focussing on bulk samples of carbonised and waterlogged deposits if any are present. Bulk soil samples may also be taken with a view to sieving for finds or human bone retrieval if deemed necessary.

8. SPECIALISTS / CONSERVATION

In the event of particularly fragile objects or sensitive materials being uncovered a relevant specialist or conservator will be called for advice or to assist on site. Items which are at risk of deteriorating will be brought to a conservator without delay. Should block lifting of fragile objects be required, the National Monuments Service and the National Museum of Ireland will be consulted and a conservator will undertake the lifting. In the event that human remains are uncovered an osteo-archaeologist will be made available. Each specialist will have a relevant post-graduate qualification. These may include:

Human remains: Denise Riordan

Animal remains: Ruth Carden / Emily Murray / Fiona Beglane

Environmental analysis and charcoal ID: Ellen O'Carroll / Susan Lyons

Prehistoric Pottery: Eoin Grogan / Helen Roche / Elaine Lynch

Medieval pottery: Clare McCutcheon / Elaine Lynch

Lithics: Dermot Moore / Conor Brady

Conservation: Susannah Kelly

9. POST EXCAVATION

The developer has been made aware of their responsibility to provide adequate funds to cover all post-excavation and specialist costs associated with the archaeological testing. A letter from the developer has been provided confirming the availability of funding for this purpose.

The site archive, and any finds, samples etc. would be kept in safe storage during the post-excavation stage. All necessary conservation would only be undertaken by a professional conservator. All finds will ultimately be housed in the National Museum of Ireland.

10. THE REPORT

A written report will be submitted within four weeks of the completion of archaeological testing to the National Monuments Service and the National Museum of Ireland. A summary of the report would also be submitted to the Excavation Bulletin within six weeks of the end of fieldwork. Should results warrant it, wider dissemination in the form of full publication may be recommended.

11. REFERENCES

Corlett, C. and Medleycott, J. (eds.) 2000. The Ordnance Survey Letters Wicklow. Wicklow. Roundwood & District Historical & Folklore Society.

Jaski, B. 2000. *Early Irish kingship and succession*. Four Courts Press: Dublin.

Kelly, F. 1995. *A guide to early Irish law*. Dublin Institute for Advanced Studies: Dublin.

Lewis, S. 1837. *A topographical dictionary of Ireland*. 2 vols, Lewis and Co., London.

Stout, G. 1994. Wicklow's prehistoric landscape. In Hanningan, K. and Nolan, W., (ed.) *Wicklow: history and society*, 1-40. Geography Publications, Dublin.

Stout, M. 1997. *The Irish Ringfort*. Dublin. Four-Courts Press.

11.1. ONLINE SOURCES

www.archaeology.ie

www.downsurvey.tcd.ie

www.excavations.ie

www.heritagemaps.ie

www.osi.ie

APPENDIX 1 DETAILED ARCHAEOLOGICAL BACKGROUND

Prehistoric period (c. 7000 – AD 500)

There is a wide-ranging and well-documented prehistoric archaeological presence in Co. Wicklow. The Early Bronze Age is particularly well represented with burial and settlement sites dating to this period located along the eastern part of the county. This period, which ran from c.2200 to c.1600 BC, witnessed a wide variety of burial practices. The earliest involved placing the remains of the dead, either unburnt or cremated, into a small cist (a box-like structure with sides lined with stone slabs placed on edge) and accompanied by a food vessel. Over time, the practice of burying unburnt bodies diminished and by approximately 1800BC the vast majority of burials were cremations. The practice of burial in cists also stopped and was replaced by the burial of cremated remains in simple pits or graves.

An urn burial (RMP WI025-107), a cremated pit burial (RMP WI025-108) and several hearths were identified and excavated during archaeological investigations that were carried out in advance of the construction of the Junction 16 interchange (Licence 01E1073). These features were discovered immediately to the east of the location of the proposed site, and in what was once the same field, within the former demesne lands of Rossana House.

Two other archaeological monuments of probable Late Bronze Age origin are recorded within the former demesne of Rossana House, less than 225m northwest of the proposed site. A circular, steep-sided mound (diameter 21m, height 3.70m) with a level summit (diameter 6.8m) is all that remains of a barrow site (RMP No. WI025-036), c. 150m northwest of the proposed site. A level circular area (diameter 11.5m) defined by a shallow fosse marks the site of a ring-ditch (WI025-036) c. 225m northwest of the proposed site.

Two small hut sites were also excavated c. 200m to the south of the proposed development site in advance of the construction of the M11 motorway (Licence No. 02E0567). Site A (RMP No. WI025-101) comprised a small crescent-shaped enclosing ditch flanked by two parallel linear drains. Site B (RMP No. WI025-102) comprised a circular enclosing ditch, a possible post-hole and other features of unknown function. A third site, Site C (RMP WI025-053), comprising two linear features with three associated pits was also excavated. The dates of the archaeological features from each of the sites are unknown. Flint artefacts were recovered from Site B, though this does not conclusively date the hut sites (excavtions.ie 2004:1877). Based on the circular morphology of the hut sites, they may date to the Bronze Age, as other excavated circular hut sites in Ireland have proven to have dated from that period.

Other Bronze Age activity in the wider landscape is attested by the presence of a burnt mound (WI025-053) in Ballybeg and three ring-ditches, one in Mountusher (WI025-051) and two in Milltown North (WI025-052 & -052001), all of which were also discovered during the M11 archaeological investigations.

Early Medieval period (c. AD 500 – AD 1200)

In the centuries prior to the Anglo-Norman invasion, the basic Irish territorial division was the túath, translated as 'tribe' or 'petty kingdom' (Kelly 1995). Its ruler was a rí tuaithe 'king of a túath', a title which encompassed the people of the túath in addition to the territory itself (Jaski 2000).

The Uí Théig tribe settled in the area around and west of Wicklow town in around 750 A.D. By about 800 A.D. the Uí Briúin Cualann had conquered the district of the Uí Théig, who were forced further west and south, the Avonmore River forming their southern boundary (Smyth 1994).

The early medieval period saw the development of a mixed-farming economy managed by kings, nobles and free farmers. There was an increase in settlement (c. AD 500–AD 1200), and the ringfort, otherwise known as the 'rath' or 'fairy fort', is the best-known native monument of this period (Stout 1997). Ringforts are enclosed farmsteads dating to the early medieval period; they are one of the most widespread archaeological sites surviving in the Irish landscape and one such monument is located c. 870m northeast of the proposed site, in Newrath townland (RMP WI025-008). The majority of the ringfort sites are univallate, surrounded by one ditch and bank, but some are surrounded by two and, to a lesser extent, three enclosing ditches and banks (known as bivallate and trivallate raths respectively). The ringfort at Newrath is situated on level ground in gently undulating terrain, it has a bivallate enclosure defined by an inner (diameter c. 25m) and outer (diameter c. 40m) fosse, that are visible as cropmarks in aerial photography (archaeology.ie).

Ringforts were not simple isolated homesteads and should be considered within their contemporary settlement landscape, which would have consisted of unenclosed settlements, farms and fields, route ways and natural resources. An additional bivallate enclosure site (RMP No. WI025-009001) is recorded c. 150m southwest of the ringfort. A possible field system (RMP No. WI025-009), visible as cropmarks on aerial photography and consisting of part of a large field (c. 80m x 70m) appears to be associated with both the bivallate ringfort and the enclosure site (archaeology.ie). Another field system (RMP WI025-068), to the northwest of these recorded monuments, is also visible on aerial photography, c. 530m northeast of the proposed site.

Medieval (c. AD 1200 – AD 1600) and Post-Medieval (c. AD 1600 – AD 1800) periods

There is recorded medieval settlement in this landscape, both in proximity to the proposed development site and in the wider landscape.

A castle site (WI025-035) is recorded c. 895m south-west in Milltown South townland. The Ordnance Survey Letters of the late 1830s describe the building as follows: '*Milltown castle, as it is called, stands in the townland of Milltown; measuring sixty-six feet in length by eighteen in breadth. The east end, about twenty six feet high remains, with a breach extending from the top half down, and the south wall remains entire to the height of about eighteen feet. The north wall and west gable are down. There is a round tower at the south west angle, nine feet diameter, the walls three feet thick and about twenty eight feet high, having six loopholes, with a window on the south side about six feet high, two feet broad and fifteen feet from the ground*'. The surviving remains were assessed in the early 2000s as being likely to represent part of an Elizabethan house (Corlett & Medlycott 2000, 79).

Five enclosure sites were excavated as part of the investigations (Licence No. 01E1073) that took place within the same field as, and to the east of, the proposed site. One of the enclosures was medieval in date, based on the recovered 12th-13th century material. Two bivallate enclosures and a single-ditch enclosure were all of post-medieval date, while the date of the fifth enclosure was not determined. The post-medieval enclosures may have been ornamental landscape features within Rossana Demesne (excavations.ie ref. 2002:1989). Several tree-ring features are recorded on the first edition OS six-inch map (1840) within the field (see Section 2.5.3).

The stone manor house, or what became known in Ireland as the 'big house', is a notable element of the rural architectural heritage. These houses were constructed by planter families or prosperous Anglo-Irish landholders in Wicklow, as elsewhere in the country, roughly between the years 1670 and 1850. They are often found near or on the sites of older ruined castles or tower houses, churches or defunct administrative centres. More commonly referred to now as country houses, they were often associated with embellished and ornamented demesne land ringed by high walls. Many are now in ruins and in many other cases demesne woodland remains as a vestigial element in landscape where all trace of the original house, its gate lodges and follies have vanished.

Rossana House (RPS 25-14) was built in the early 18th century (and later extended) and was the home of the Tighe family. Rossana was a house well-known to poet Mary Tighe (née Blachford) who often stayed there, although she would die in March 1810 at Woodstock, County Kilkenny (https://theirishaesthete.com/tag/rossana/).

CARTOGRAPHIC SOURCES

Down Survey map (1654-58)

The Down Survey of 1656-58 was, undertaken in order to measure the land forfeited from the Catholic population to be redistributed amongst merchant adventurers and loyal English soldiers. (Figure 6). The proposed development site lies within unfortified, and consequently unsurveyed, lands on the barony map of Newcastle (Figure 6). The approximate location of the site can be plotted on the map according to its proximity to the River Vartry to the north and to the townlands of Parktown (present-day Ballinapark) and Ballemikaher (present-day Ballymacahara).

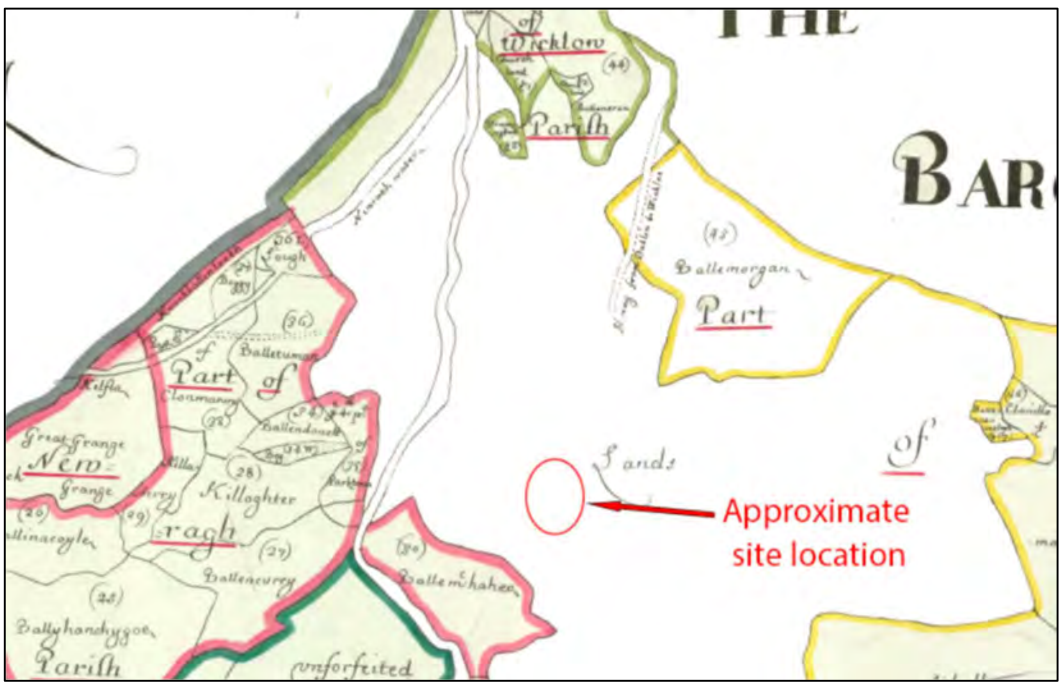


Figure 6 Detail of the Down Survey Map of the Barony of Newcastle, showing approximate site location

Jacob's map of County of Wicklow (1800)

The proposed development site is within undeveloped land on Jacob's map of County Wicklow (Figure 7). Several of the large houses that have given their names to the present-day townlands are depicted on the map including Rossana, Clermont and Mount Usher, within the previously unfortified lands that were depicted on the Down survey map. The proposed development site is east of Rossana House, within the demesne, which is indicated as parkland with specimen trees. A mill is indicated at the river to the northeast. There is a well-developed road network in the surrounding area.

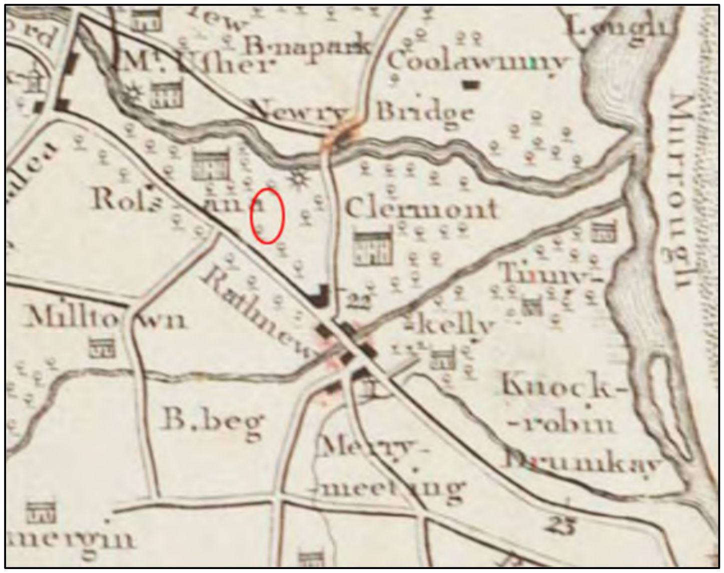


Figure 7 Detail of Jacob's Map of County Wicklow (1800) with approximate site location (in red)

Ordnance Survey maps (19th to 20th century)

The Ordnance Survey first edition six-inch map (1840; Figure 8) produced maps on a national scale, recording natural features, topographical conditions, built structures and archaeological features. They represent the earliest accurate and detailed cartographic source for the study area. The map shows that the proposed development site lies within the demesne lands of Rossana House, which was built c. 1720. The house was situated close to the River Vartry, with extensions to the south and an attached range of courtyard buildings. Trees lined most of the carriageway from the entrance to the south (at the public road) and there was also woodland planting around the house and along the north-western and eastern boundaries of the estate. One of the network of paths ran parallel to the river, close to the house, and the river banks had been left unplanted immediately north and north-west of the house. The house front faced east / north-east but a projection on the northern end of the building may have housed a bay window that captured the river view.

An earthwork is shown on the map in the parkland near the house (RMP site WI025-007, mound).

The proposed development site formed part of a large, enclosed field, the boundaries of which were tree-lined. This area was distinct from the otherwise unenclosed parkland of the demesne. A tree-ring is depicted within the field (just north-east of the site boundary). It is unclear if this is a feature of antiquity or part of a designed landscape, though the presence of specimen trees around the parkland and two tree-clumps of varying size in the same field to the south and south-east (one of which may represent a smaller tree-ring) suggest the latter.

The demesne extended south of the public road and the grounds on this side included a walled garden containing an orchard and a rectangular fish pond (a common feature of 18th century estates). Beyond this, there was greater subdivision of fields, suggesting the southern half was the working part of the demesne. A tree in the road just outside the estate to the north-west was named '*Duke of Richmond's Tree*'. A police station is indicated close to the walled garden, just south of the road. Its position on private land, within the demesne rather than further north-west in Ballinalea village, suggests a connection to the estate (perhaps through funding or patronage).

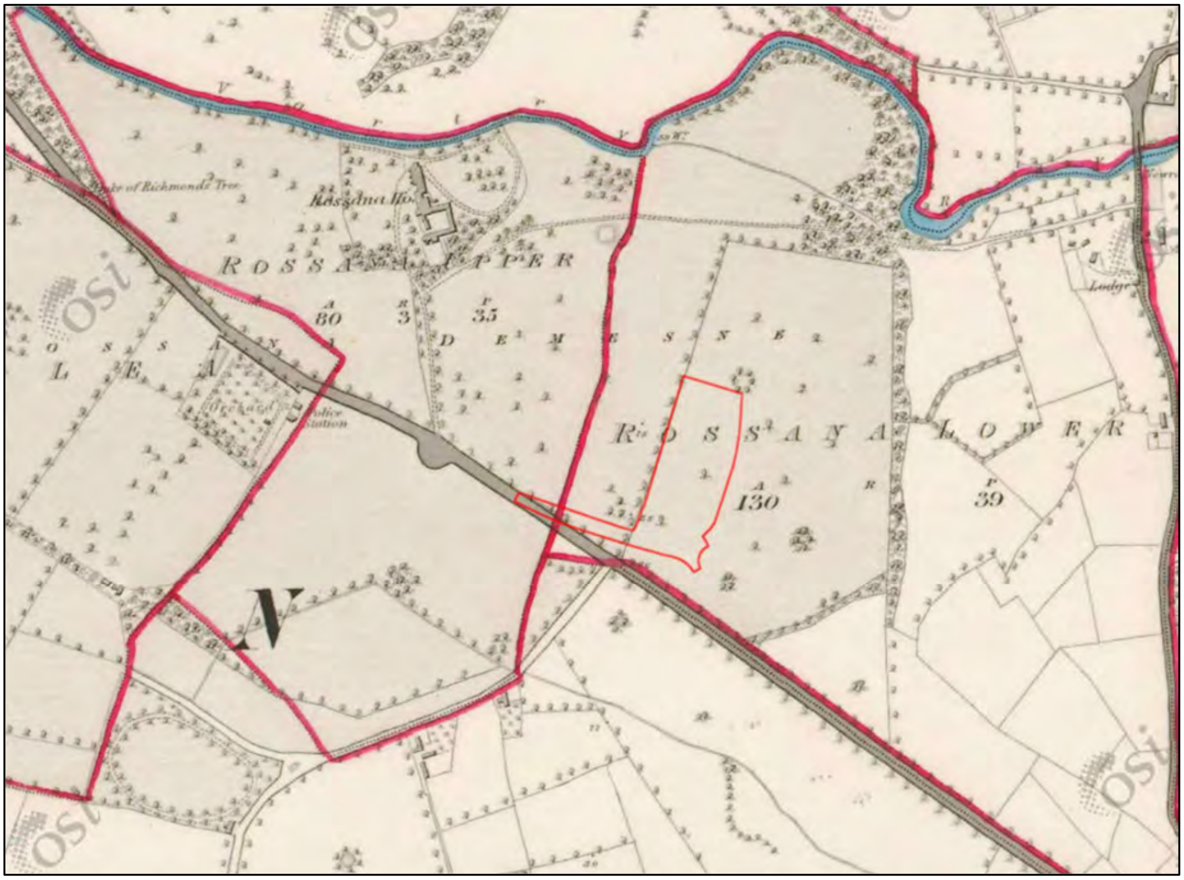


Figure 8 Detail of First Edition six-inch OS map (1840) with approximate site location (in red)

By the time of the 25-inch map (1910) there had been little significant change within the Rossana estate north of the public road (Figure 9). The tree-lined avenue had been completely planted and enclosed and additional outbuildings are depicted to the south of the courtyard. A small triangular field outside the demesne as depicted on the first edition map had been incorporated into the large, enclosed field to the east of the parkland. South of the public road, other field boundaries had also been removed to create larger fields. These changes are symptomatic of the changes in the surrounding landscape where little development had taken place yet many field boundaries had been removed since the time of the first edition map. This changing agricultural landscape may have been the result of land consolidation in the wake of the Land Acts of the late 19th and early 20th centuries. The tree-ring previously depicted to the north-east of the proposed development site is no longer shown on this map edition. Similarly, on the south side of the road, the former walled garden is empty and the rectangular fish pond is now an oval pond. The police station is not indicated.

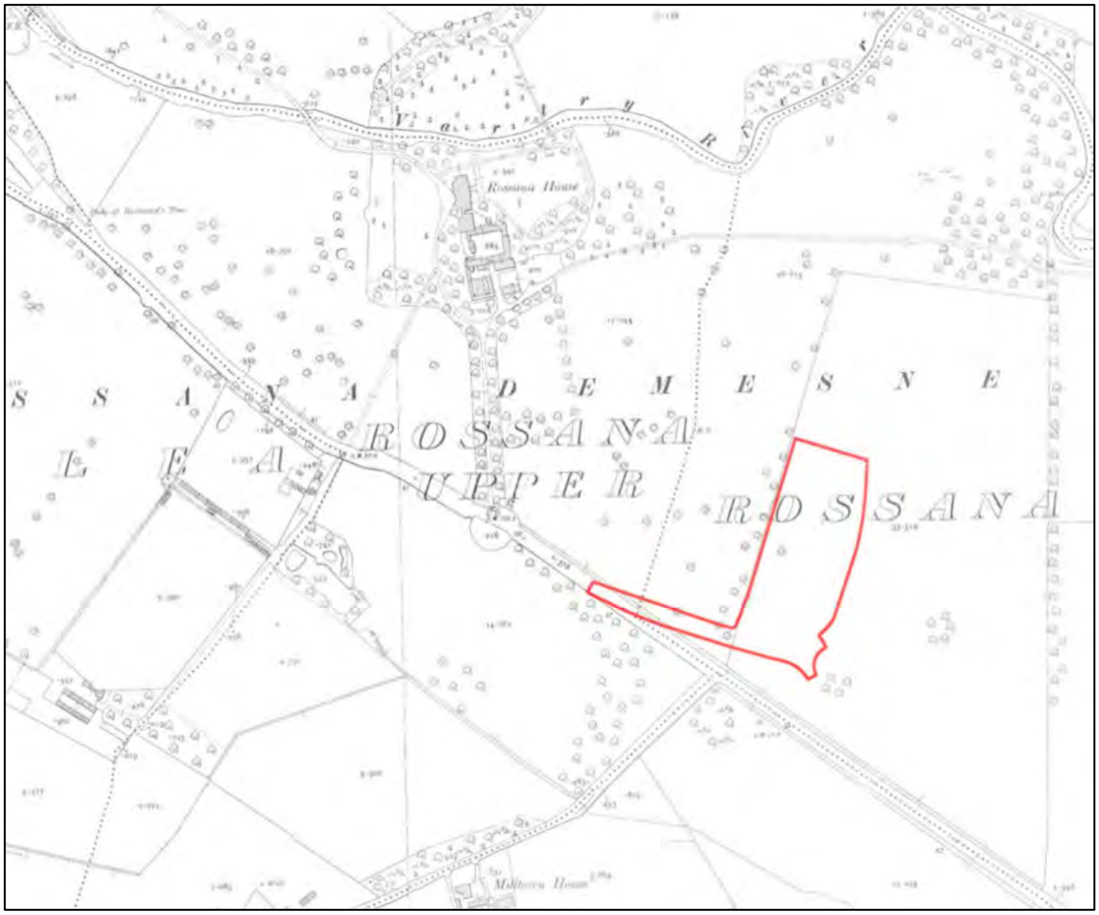


Figure 9 Detail of 25-inch OS map (1910) with approximate site location (in red)

AERIAL AND LIDAR IMAGERY

Aerial imagery

Aerial photography from the later 20th century (OSi imagery 2000; Figure 10) shows the Rossana estate and its immediate environs as much as it had been on the OS 25-inch map (Figure 9) from 90 years previously. While some residential housing had been constructed to the south, most of the development was focused on Ballinalea village to the north-west.

The M11 motorway had begun construction shortly after that (early 2000s) and its impact on the estate is clear in current aerial imagery (Figure 11). Much of the large field at the south-east end of the Rossana demesne (within which the proposed development site is located) is now occupied by the motorway carriageway and Junction 16 interchange. The R772 road, which runs along the south side of the site was realigned as part of the Motorway works. The proposed development site appears not to have been disturbed by the development of the motorway. No cropmarks relating to the tree-ring(s) are evident. Although there are no visible features within the site or its environs on aerial imagery, a number of previously unknown sites with no above-ground remains or trace were identified and excavated within this field, in the section of the motorway interchange adjacent the site (see Section 5).

Figure 10 OSi Aerial imagery (2000), showing approximate site location (in red)

Figure 11 Google Earth Pro (2021), showing site location (in red)

LiDAR imagery

No major depressions of rises that might be indicative of potentially significant archaeological sites are visible within the proposed development site in contemporary LiDAR imagery of the area (Figure 12; https://dcenr.maps.arcgis.com/apps/webappviewer). Several long, linear features and a kidney-shaped depression are discernible to the west of the proposed site, within the former demesne grounds of Rossana House.

Figure 12 LiDAR imagery (2021), showing site location (in red)

PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS

There have been no archaeological investigations within the proposed development site, however, archaeological investigations were carried out in its vicinity in advance of the construction of the M11 motorway (Table 2, Figure 13). Sites discovered in the area immediately adjacent the site during the investigations include a Bronze Age urn burial and cremated burial and five enclosures, one of medieval date, three post-medieval and one of uncertain date (Licence Nos. 01E0862 & 01E1073). The results of the investigations are summarised in Table 2, with additional detail provided in Appendix 1. They are also discussed in the context of the archaeological and historical background in Section 2.

Table 2 Previous archaeological investigations in the vicinity of the proposed development site

Licence No.	Excavations.ie Ref.	Townland / Project	Archaeology
01E0862	2001:1384	Rossana Lower / Testing N11 Newtownmountkennedy to Ballynabarny	Medieval / post-medieval – five enclosures, later excavated under 01E1073
01E1073	2001:1385 / 2002:1989	Rossana Lower / Excavation N11 Newtownmountkennedy to Ballynabarny	Bronze Age – urn burial, cremated pit burial and numerous hearths. Medieval / post-medieval – one 12tth-13th century enclosure, two

Licence No.	Excavations.ie Ref.	Townland / Project	Archaeology
			bivallate post-medieval enclosures, one single-ditch post-medieval enclosure and one enclosure of uncertain date.
02E0567	2004:1877	Milltown North / Excavation N11 Newtownmountkennedy to Ballynabarny	Hut sites of unknown date with unprovenanced flint artefacts. Site A – small enclosing ditch, field drains Site B – circular enclosing ditch and post-hole Site C – linear features and pits
02E0703	2002:1979	Milltown North / Excavation N11 Newtownmountkennedy to Ballynabarny	Bronze Age – two ring-ditches, two urn burials, a possible cremation pit and associated pits

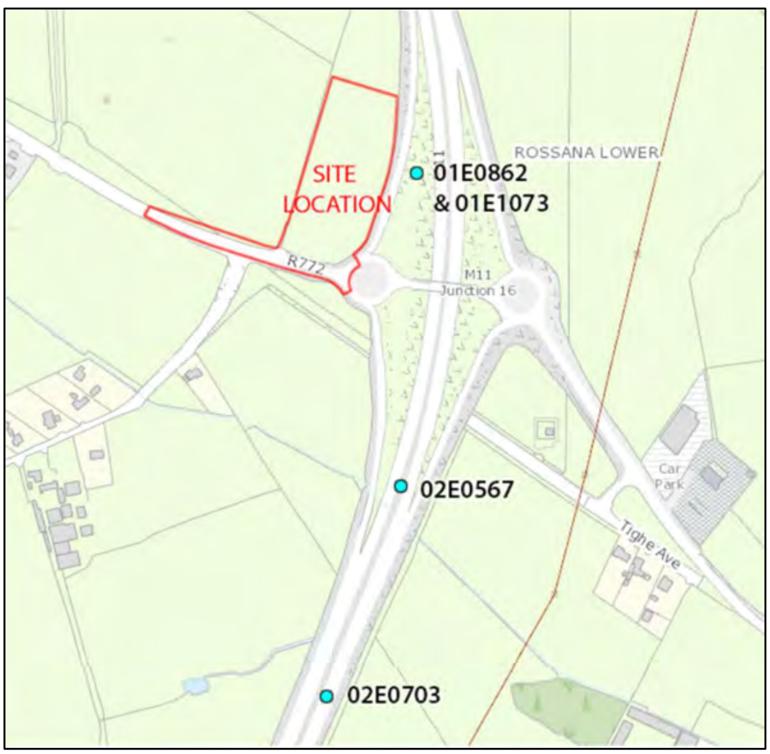


Figure 13 Previous archaeological investigations in the vicinity of the proposed development site

An Roinn Tithíochta,
Rialtais Áitiúil agus Oidhreachta
Department of Housing,
Local Government and Heritage

Excavation Licence

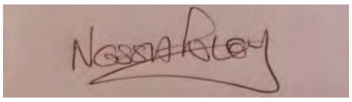
National Monuments Acts (1930-2014)

Licence Number	24E0017

Application having been duly made to me by	Liam Coen
Of	Courtney Deery Heritage Consultancy Lynwood House Ballinteer Road Dublin 16 D16H9V6
For a licence to excavate at the site located at	Rossana Lower
Site details (place/structure/wreck/other)	Greenfield site in environs of WI025-107, -108 *urn burial and cremation pit* and other recorded sites
Being part of the townland of	Rossana Lower
In or under the portion of land/land underwater owned by	National Transport Authority
Of	Dúín Scéine Harcourt Lane Dublin 2 D02WT20
In county of	Wicklow

The Minister for Housing, Local Government and Heritage, in accordance with the conditions of Section 26 of the National Monuments Act, 1930, as amended, and subject to the conditions overleaf, does hereby licence the said applicant **(hereinafter** called the Licensee) to dig or excavate for the purpose specified in or under that portion of land above-mentioned.

Duration of licence: 09/01/2024 to 08/04/2024

Signed:  Date: 09/01/2024

Standard Conditions to which any licence issued under section 26 of the National Monuments Act 1930 (as amended) are subject:

Any licence issued will be subject to the following conditions and any other conditions that may be specified to the licensee.

1. This licence is issued on the basis of information provided by the applicant and on the understanding that all information provided with the application, and associated statements made by the applicant, are accurate and truthful.

2. The licensee must obtain permission from the owner of the land/ wreck to carry out the excavation and particularly to alter, dig or excavate in or under the site before availing of this licence. No responsibility or liability shall attach to the Minister for failure on the part of the licensee to obtain such permission.

3. By accepting the licence, the applicant acknowledges that the Minister is not responsible or liable in any manner for any loss or injury to persons or property in any way arising from the licensed activities.

4. The licensee shall restore the land to its original condition on termination of this licence, unless otherwise directed by the landowner.

5. The licensee shall comply in all respects with the provisions of the National Monuments Acts 1930 to 2014 and any Acts altering, amending or replacing those Acts. Copies of the Acts are available from the National Monuments Service website www.archaeology.ie and from Government Publications (see http://www.opw.ie/en/governmentpublications/).

6. Under the provisions of section 2 of the National Monuments (Amendment) Act 1994 the ownership of an archaeological object found in the State which has no known owner at the time it is found stands vested in the State. The National Museum of Ireland is the State repository for all such archaeological objects. The licensee shall adhere to the directions of the Director of the National Museum of Ireland in relation to the final disposition/location of any archaeological objects and the temporary storage of finds and also to advice notes issued by the National Museum of Ireland. Separate licences must be applied for under the relevant provisions of the National Monuments Acts 1930 to 2014 and the National Cultural Institutions Act 1997 if it is intended to alter (which includes to destructively sample), or export any archaeological object recovered during the excavation.

7. The licensee shall be given a reference number in relation to each excavation or part thereof which shall be used in all correspondence relating to the excavation and for the numbering of finds (if any) recovered during the excavation. The licensee shall also comply with the requirements of the National Museum of Ireland as regards to the numbering and care of archaeological objects.

8. The licensee shall conduct the excavation in accordance with the method statement as submitted with the applicant's application for a licence under section 26 of the National Monuments Act 1930 (as amended) and also in accordance with the information provided (including answers given) in or on the application form submitted with that application, subject to any amendment approved by the National Monuments Service prior to the issue of this licence. Once the licence has been issued, any proposed amendment or variation to the methodology set out in those documents must be submitted in advance to the National Monuments Service and can only be proceeded with if approved by the National Monuments Service.

9. The licensee shall comply with the *Policy and Guidelines on Archaeological Excavations* (1999) and any subsequent policies, guidance or advice, issued by, or on behalf of the Minister and advice notes issued by the National Museum of Ireland.

10. Unanticipated discovery of human remains must be reported as soon as possible to the National Monuments Service and the National Museum of Ireland.

11. (1) The licensee shall:

a) Lodge **one digital (PDF/A format on CD or USB) and two hard copies** of a Preliminary Report on the excavation with the National Monuments Service, and **one digital (PDF/A format on CD or USB) and one hard copy** of same with the National Museum of Ireland within four weeks of the completion of the excavation. The Preliminary Report **must** be in the recommended format set out in the *Guidelines for Authors of Reports on Archaeological Excavations* (2006) issued by the National Monuments Service. Note that the coordinate referencing system in current use is the Irish Transverse Mercator (ITM) and not the 'National Grid' as set out in the Guidelines (pp. 3, 5, 8).

b) Lodge as an appendix within the preliminary report (referred to in (a) above) a 'Monument Report Form' for every previously-unrecorded monument discovered in the course of the excavation. The monument classification used on the form must accord with that operated by the National Monuments Service (see www.archaeology.ie Historic Environment viewer).

c) Unless otherwise agreed with the Minister, lodge, within twelve months of completion of the excavation, **one digital (PDF/A format on CD or USB) and two hard copies** of the Final Report on the excavation with the National Monuments Service, and **one digital (PDF/A format on CD or USB) and one hard copy** of same with the National Museum of Ireland. The Final Report **must** be in the recommended format set out in the *Guidelines for Authors of Reports on Archaeological Excavations* (2006) issued by the National Monuments Service. Note that the coordinate referencing system in current use is the Irish Transverse Mercator (ITM) and not the 'National Grid' as set out in the Guidelines (pp. 3, 5, 8). This report must be to publication standard and include a full account, suitably illustrated, of all archaeological features, finds and stratigraphy along with a discussion and specialist reports.

d) Publish a concise report to the standard accepted for publication on the www.excavations.ie website for the year in which the licence is valid.

e) Lodge with the National Monuments Service one copy of any publication where the results of the excavation have been published.

f) Without prejudice to any of the above, where the licensee submits a written report on the excavation to another person or body prior to having submitted the reports referred to above to the National Monuments Service then the licensee shall notify the National Monuments Service in writing (which may be in email form) that such report has been submitted to that other person or body.

Without prejudice to any other requirements regarding the format of a report to be submitted to the National Monuments Service and the National Museum of Ireland in accordance with the above, all such reports shall be in two separately bound parts (or in the case of digital copies two separate files) as follows:

First Part

The first part shall contain purely archaeological information, i.e. the nature of the site in archaeological terms and the results in archaeological terms of the archaeological excavation. This part shall be identified using the references number provided to the licensee under Condition 7 above. The first part shall, in particular, contain no personal data other than the name of the licensee.

Second Part

The second part shall contain other information where appropriate to be provided regarding the archaeological excavation, e.g. owner of the site, reasons for carrying out the archaeological excavation (other than archaeological research), information regarding funding and planning and development issues. This second part shall be identified with the same reference number but with an "X" appended.

12. The Minister may publish or make generally available in any form (including printed or electronic form which, without prejudice to any other form of publication or making available, may include publishing or making available on the internet), any report, or part thereof, submitted under or in fulfilment of the conditions of this licence. A copy of a report so published or made available may identify the licensee.

13. The final place of deposition of all archives associated with the archaeological excavation shall be the National Monuments Service archive except as may be otherwise directed by the Minister,

…..

which direction (which shall be complied with by the licensee) may provide for the deposition (in such manner as the Minister may determine) of the archives in another appropriate place or places or their disposal (whether in whole or part) in such manner as the Minister may determine. Where the final place of deposition is the National Monuments Service archive, the licensee shall comply with all directions and requirements of the Minister in regard to the manner and timing in which the archives are presented for deposition. Pending the deposition or disposal of the archives in accordance with the foregoing, the licensee shall maintain the archives safely and securely and shall advise the Minister, as and when requested, as to their location and the provision being made for their safety and security and shall provide access to the officers or agents of the Minister to inspect the archives at any reasonable time. Nothing in the foregoing shall oblige the Minister to accept deposition of all or part of the archives in the National Monuments Service archive, or to otherwise accept any responsibility for the archives, unless the Minister is satisfied that all other conditions of the licence have been complied with or fulfilled and that it is appropriate to accept such deposition or responsibility. In the foregoing 'archives' includes plans, drawings, photographs, site notebooks, record sheets, context sheets, finds lists or similar or related material whether in paper, hard copy or digital form.

14. Officers, servants or agents of the Minister or the Board of the National Museum of Ireland may inspect at any reasonable time the archaeological excavation to which this licence applies and (without prejudice to the provisions of condition 13) any associated storage facilities, archives or records and the licensee shall facilitate any such inspection. In the foregoing 'reasonable time' includes (but is not limited to) any time when archaeological excavation work is being carried out on or at the location of the archaeological excavation or any time when post-excavation is being undertaken.

15. The licensee accepts that failure by her or him to comply with or fulfil any of the above conditions shall be grounds for the Minister to refuse to issue to her or him any further or other licence under section 26 of the National Monuments Act 1930 (as amended), or to otherwise authorise or permit her or him under any other provision of the National Monuments Acts 1930 to 2014 to carry out archaeological excavation, until such time as such non-compliance or non-fulfilment has been rectified to the satisfaction of the Minister in such manner as the Minister may determine. Nothing in this condition shall be interpreted as obliging the Minister to issue or grant any particular licence or consent which may be applied for under the National Monuments Acts 1930 to 2014. An applicant aggrieved by a refusal by the Minister pursuant to this Condition to issue or grant a licence or consent may request the Minister to review the decision. Where such a review is requested, the Minister will appoint an independent and appropriately qualified person or persons to review the case and make a recommendation to the Minister. The final decision on the matter will rest with the Minister. Any applicant requesting a review under the provisions of this Condition must comply with any procedures specified by the Minister for requesting such a review and provide any information reasonably requested by the Minister or the independent person or persons appointed by the Minister under this Condition, including making themselves or any documents, records, objects or other material associated with the archaeological excavation available for interview or examination as the case may be.

16. This licence may be revoked or suspended by the Minister on grounds of breach of, or non-compliance with, any condition of this licence or otherwise on the grounds that such revocation or suspension is necessary in the interests of protection of the archaeological heritage or otherwise in the public interest. This is without prejudice to any powers of the Minister under any enactment.

17. The licensee shall notify the National Monuments Service in writing (which may be in email form) of the commencement of the excavation and of the conclusion or cessation (whether temporary or permanent) of archaeological excavation at the location to which the licence relates. Such notification shall take place as soon as may be after such commencement, conclusion or cessation.

18. If the licensee decides or become aware that the licence will no longer be availed of within the time period for which it was issued, then the licensee shall, as soon as may be, notify the National Monuments Service in writing (which may be in email form) of this.

APPENDIX I

Landscape and Visual Impact Assessment

macroworks

LANDSCAPE AND VISUAL IMPACT ASSESSMENT

Proposed Park and Ride Facility – Screening Report

Rossana Upper, Co. Wicklow.

Prepared by Macro Works Ltd

May 2024

LVIA I TVIA I Landscape Design I Visibility Analysis I Glint and Glare I Verified Photomontages I CGI I Shadow Flicker Analysis

1 LANDSCAPE AND VISUAL SCREENING REPORT

1.1 INTRODUCTION

This Landscape and Visual Impact Assessment (LVIA) screening report has been prepared in respect of a planning application for a Park and Ride Facility at Rossana Upper southeast of the settlement of Ashford in County Wicklow. The LVIA screening report describes the landscape context of the proposed development and assesses the potential landscape and visual impacts of the scheme on the receiving environment.

Landscape Impact Assessment (LIA) relates to assessing effects of a development on the landscape as a resource in its own right and is concerned with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character.

Visual Impact Assessment (VIA) relates to assessing effects of a development on specific views and on the general visual amenity experienced by people. This deals with how the surroundings of individuals or groups of people may be specifically affected by changes in the content and character of views as a result of the change or loss of existing elements of the landscape and/or introduction of new elements. Visual impacts may occur from; Visual Obstruction (blocking of a view, be it full, partial or intermittent) or; Visual Intrusion (interruption of a view without blocking).

1.1.1 Statement of Authority

This Landscape and Visual Impact Assessment report was prepared by Macro Works Ltd; a landscape consultancy firm specialising in LVIA along with associated visibility mapping and photomontage graphics. Relevant experience includes LVIA work for a vast range of infrastructural, industrial and commercial projects since 1999.

1.1.2 Description of the Proposed Development

The proposed development comprises a car park with 210 parking spaces, including 13 designated for users with mobility impairments, 21 for electric vehicles, and an additional 21 spaces future-proofed for electric vehicles. The proposal entails the installation of fencing, kerbs, drainage, road markings, public lighting, CCTV, ticketing machines, as well as a new ESB substation and switch room. Additionally, the proposal includes the provision of active travel connections and hardstanding areas for bike shelters and lockers. The scheme also incorporates an area with two bus bays, two passenger shelters, and a dedicated bus turning circle within the site. A new all-movement uncontrolled access junction is proposed at R772 to provide access to the facility that will feature a newly added right-turning pocket lane, achieved by widening the carriageway.

1.2 LANDSCAPE AND VISUAL POLICY CONTEXT AND DESIGNATIONS

1.2.1 Wicklow County Development Plan (CDP) 2022-2028 – Landscape

A landscape character assessment is incorporated the current Wicklow County Development Plan, which divides the county into 6 no. landscape character units and a further 15 geographically specific landscape character areas. The proposed development at Rossana Lower is contained in the landscape character unit 'Corridor Area – The N11'. This landscape unit is described as an area that *"covers the main access corridor area along the east of the County. The boundary of the eastern access corridor generally follows what is considered to be the areas upon which the greatest influence is exerted by this primary access route. This route, for the most part, runs through the more low lying and accessible tracts of land, dissects the Glen of the Downs wood in the north of the County and provides expansive coastal views north of Wicklow Town. This landscape area acts as the main connection between the majors towns along the east coast of the County."*

It is worth noting that the proposed development is bounded by the landscape unit 'Urban Areas' to the east and west, which are associated with the settlements of Ashford and Rathnew. In terms of landscape classification 'Urban Areas' *"have already been deemed suitable for development (of the type allowed by the settlement strategy and the development standards of this plan) and the impacts on the wider landscape of such development has already been deemed acceptable. Therefore it will not be necessary for developments in urban areas to have regard to the surrounding landscape classification or to carry out landscape or visual impact assessment."*

Landscape sensitivity is addressed at a much finer scale than that of landscape units and Landscape Character Areas and is based more on specific landscape features, topography and land cover. The proposed development site is located in an area of classified with a '*Low Sensitivity',* whilst some localised parts of the immediate surrounding landscape are classified with a '*Medium-High*' sensitivity classification, which principally relates to local rivers and streams such as the River Varty to the north of the site. In the wider surrounds of the site, the landscape to the east is generally classified with a 'Low' sensitivity as it is principally characterised by typical rural farmland and urban area. Nonetheless, a notable area of 'High' sensitivity occurs in the wider landscape to the east of the site and relates to the landscape unit 'Coastal Area (Area of Natural Beauty).

Views and prospects in County Wicklow are set out in Tables 17.11 and 17.12 and on Maps 17.10 and 17.11 of the current Wicklow CDP. There are no views or prospects of special amenity value within the immediate vicinity of the site. The nearest designated views are located over 1.4km northwest of the site, and relates to a scenic view oriented in the opposite direction of the site along a contained section of the River Varty at the settlement of Ashford.

Natural Heritage 7 Biodiversity objectives outlined in section 17.4 of the current county development plan, some of which are relevant to the proposed development and have been considered as part of this screening report.

1.3 EXISTING ENVIRONMENT

1.3.1 Landscape Baseline

The landscape baseline represents the existing landscape context and is the scenario against which any changes to the landscape brought about by the Development will be assessed. It is worth noting, however, that many of the landscape elements identified in the landscape baseline also relate to visual receptors i.e., places and transport routes from which viewers can potentially see the proposed development.

The proposed development is located in a small agricultural land holding immediately east of the M11 motorway corridor. The site's terrain is relatively flat and sits approximately c. 20m AOD and drains north towards the Vartry River, which is situated just over c. 200m north of the site. On a broad scale, the terrain ascends in the wider western half of the study area towards the foothills of the Wicklow Mountains. In the wider landscape to the east, the landscape is heavily influenced by the coastline and its coastal features. Whilst the predominant land use within the study area is agricultural farmland bound by mixed hedgerow vegetation and mature tree lines, the study area also encompasses an array of anthropogenic land uses associated with the settlements of Ashford, Rathnew and Wicklow Town. The M11 motorway corridor is situated immediately east of the site and is typically bound by sections of dense mature vegetation. The site is also bound by a demesne landscape to the west, which comprises Rossana House.

The settlements of Rathnew and Ashford are both situated within the near vicinity of the site. The outskirts of both Rathnew and Ashford are located less than c. 1km to the southeast and west of the site, respectively. The larger settlement of Wicklow town is also located within the wider study area, the outskirts of which are located just over 2.5km southeast of the site. In terms of local settlement pattern in the site's immediate vicinity, the nearest dwellings to the proposed development are located along a local road some c. 150m south of the site. A cluster of residential dwellings is also located along this local road corridor further to the south again, whilst a residential cluster is also located along the R772 regional road some c. 275m west of the site. The nearest and most notable major route to the proposed development is the M11 motorway corridor, which is situated immediately east of the site and traverses the eastern half of the study area in a general north–south direction. The R772 also traverses immediately south of the site and connects the settlements of Ashford and Rathnew.

The immediate landscape context is not highly synonymous with recreational amenity as it is heavily influenced by the M11 major route corridor. Some aspects of amenity are associated with the wider study area, which principally relates to the settlements of Ashford and Rathnew. Mount Usher House and Gardens is a popular pay-in attraction in this part of Wicklow. The gardens are situated along the banks of the Vartry River just outside the centre of Ashford Town, approximately 1km northwest of the proposal site. Mount Usher Gardens displays hundreds of trees and shrubs species and also includes several small walking trails, a café and a number of small shops. Ashford GAA club is also located along the banks of the Vartry River just off Ashford main street and is situated 1.4km northwest of the site.

1.4 IMPACT POTENTIAL

1.4.1 PHYSICAL LANDSCAPE AND LANDSCAPE CHARACTER EFFECTS

The most notable physical impacts related to the proposed development are associated with regrading the site to facilitate the proposed park and ride facility, which will involve areas of cut and fill. Whilst every effort has been made to reduce the need for large areas of cut and fill, there will be some areas of soil stripping to accommodate the proposed access tracks, parking bays and footpaths. There will be physical disturbance of soil/subsoil to accommodate the foundations of the proposed structures, such as the proposed bus shelters, bicycle shelters, changing points and lighting poles. Overall, the physical impacts of the proposed development will be relatively modest as it is located within an existing agricultural landholding that is already influenced by the M11 motorway corridor.

There will be construction stage landscape impacts relating to the excavation of materials, temporary storage of such materials and other building materials, and the occasional movement of construction machinery. However, such construction stage impacts will be temporary in duration and will cease once the facility is complete. Furthermore, the movement of HGVs along the surrounding road network is not uncommon, as an existing waste management facility is located immediately west of the proposed development. There will be some minor hedgerow removal/cutting back at the existing site entrance to achieve the proposed sightlines.

In terms of impacts on the character of the receiving landscape, these will be notably diluted by the fact that the proposed development is currently influenced by the existing M11 corridor, which the proposed development is thematically linked to. There will also be an increase in road traffic along the surrounding road network, however, this will not be out of character within this landscape context that is influenced by an existing major route corridor. Even if viewed from the immediate surrounding landscape, the proposed development represents the intensification of major route infrastructure, which is the primary influence on the landscape in the immediate surrounds of the site. Furthemore, the proposed development is not out of character in this ‘Corridor Area’ landscape character unit.

Overall, the proposed development is considered relatively modest in terms of its scale and nature, and is located within the existing agricultural land holding, which will be enhanced as part of the landscape mitigation strategy, which encompasses an array of native and pollinator friendly plantings. The proposed development is also considered a characteristic addition to the immediate landscape context, which is already heavily influenced by major route corridors.

1.4.2 VISUAL AMENITY EFFECTS

With regard to the potential visual impact of the proposed development, this is heavily diminished by the heavily contained nature of the site, which, aside from its immediate context, will be considerably screened by a belt of mature vegetation that occurs in the immediate site's surroundings. This will also be further enhanced by a comprehensive landscape strategy, which includes further areas of hedgerow planting and understorey planting along the perimeter of the site. Appendix B includes a booklet of outline montages, which encompasses four viewpoints from some of the nearest receptors to the site, representing various viewing distances, angles and receptor types.

Viewpoint One is representative of the wider settlement of Ashford and the major route that Ashford is accessed from the south. The proposed development will be entirely screened from here by the dense layers of intervening vegetation in the direction of the site.

Viewpoint Two is located slightly closer to the site on the R772 regional road adjacent to a small cluster of residential dwellings. The depicted view is oriented back along the regional road to the east, where layers of dense intervening vegetation will screen any visibility of the proposed development.

Viewpoint Three is also located along the R772 regional road but immediately south of the site and is the nearest section of road to the proposed development. It is located immediately adjacent to the site entrance where a brief view will be afforded into the proposed Park and Ride facility. Nonetheless, the proposed landscaping, which includes some native woodland edge planting and new sections of hedgerow along the boundary of the site, will largely screen the development, even from this section of the road located immediately adjacent to the proposed development. Indeed, the only residual visibility of the proposed park-and-ride development will be immediately in front of the site entrance, where a brief view of the development is afforded. Whilst the proposed development will marginally increase the intensity of built development along this section of the regional road, the development will not appear out of place here and will be viewed as an associated development type to the motorway corridor, which it sits adjacent to. The proposed development also does not include any highly prominent built features, which diminishes its potential to have any notable visual effect from here. Furthermore, the proposed landscaping will further assimilate the development into this landscape context, comprising a mix of native woodland edge and hedgerow plantings, native trees and areas of pollinator-friendly plantings. Thus, it is not considered that the proposed development will generate significant visual effects here. Instead, visual effects are considered to be in the lower order of magnitude.

Viewpoint Four is located along a local laneway to the south of the site and is representative of the nearest surrounding local residential receptors. The proposed development will be fully screened from here due to the dense layers of vegetation in the direction of the site.

Overall, the proposed development is located in a relatively well-contained site and will barely be visible from its surrounding immediate landscape context. Even if briefly viewed from the site entrance, the proposed development will have a very limited visual effect and will not present as an incongruous development in this local landscape context that is already heavily influenced by the existing major route corridor.

1.5 CONCLUSION

The proposed park-and-ride facility is considered an appropriate site development that will only have a modest physical impact on the receiving landscape. Impacts on the local landscape character will be limited to the immediate surrounds of the site due to the high degree of intervening vegetation that occurs in the immediate surrounds of the site, which limits any clear visibility of the proposed development to a brief section of the R772 regional road corridor south of the site. Furthermore, this is not considered a highly rare or distinctive landscape setting, which is further reinforced by the 'Low' landscape sensitivity that contains much of the site and surrounding local landscape context.

In terms of visual impacts, only a fleeting glimpse of the proposed development will be afforded from a section of the regional road located at the site entrance. The high degree of vegetation within the intervening landscape, which will be reinforced by the proposed landscape strategy, will almost entirely screen the development from all surrounding receptors.

Thus, it is considered that in this robust and heavily modified landscape context that is notably influenced by the existing M11 motorway corridor. Therefore, it is not considered that the proposed development will result in significant landscape and visual effects. Instead, the residual effects will be in the lower order of magnitude.

APPENDIX A – LVIA ASSESSMENT METHODOLOGY

1.5.1 Assessment Methodology

Production of this LVIA screening report involved:

- A desktop study to establish an appropriate study area, relevant landscape and visual designations in the Wicklow County Development Plan as well as other sensitive visual receptors. This stage culminates in the selection of a set of potential viewpoints from which to study the effects of the proposal;
- Fieldwork to establish the landscape character of the receiving environment and to confirm and refine the set of viewpoints to be used for the visual assessment stage;
- Assessment of the significance of the landscape impact of the development as a function of landscape sensitivity weighed against the magnitude of the landscape impact; and
- Assessment of the significance of the visual impact of the development as a function of visual receptor sensitivity weighed against the magnitude of the visual impact. This aspect of the assessment is supported by photomontages prepared in respect of the selected viewpoints.
- Incorporation of mitigation measures to reduce potential impacts and estimation of residual impacts once mitigation has become established.

1.5.1.1 Landscape Impact Assessment Criteria

When assessing the potential impacts on the landscape resulting from a proposed development, the following criteria are considered:

- Landscape character, value and sensitivity;
- Magnitude of likely impacts; and
- Significance of landscape effects

The sensitivity of the landscape to change is the degree to which a particular landscape receptor (Landscape Character Area (LCA) or feature) can accommodate changes or new elements without unacceptable detrimental effects to its essential characteristics. Landscape Value and Sensitivity is classified using the following criteria set out in **Table 0.1.**

Table 0.1 Landscape Value and Sensitivity

Sensitivity	Description
Very High	Areas where the landscape character exhibits a very low capacity for change in the form of development. Examples of which are high value landscapes, protected at an international or national level (World Heritage Site/National Park), where the principal management objectives are likely to be protection of the existing character.
High	Areas where the landscape character exhibits a low capacity for change in the form of development. Examples of which are high value landscapes, protected at a national or regional level (Area of Outstanding Natural Beauty), where the principal management objectives are likely to be considered conservation of the existing character.
Medium	Areas where the landscape character exhibits some capacity and scope for development. Examples of which are landscapes, which have a designation of protection at a county level or at non-designated local level where there is evidence of local value and use.

Low	Areas where the landscape character exhibits a higher capacity for change from development. Typically, this would include lower value, non-designated landscapes that may also have some elements or features of recognisable quality, where landscape management objectives include, enhancement, repair and restoration.
Negligible	Areas of landscape character that include derelict, mining, industrial land or are part of the urban fringe where there would be a reasonable capacity to embrace change or the capacity to include the development proposals. Management objectives in such areas could be focused on change, creation of landscape improvements and/or restoration to realise a higher landscape value.

The magnitude of a predicted landscape impact is a product of the scale, extent or degree of change that is likely to be experienced as a result of the proposed development. The magnitude takes into account whether there is a direct physical impact resulting from the loss of landscape components and/or a change that extends beyond the Site boundary that may have an effect on the landscape character of the area. **Table 0.2** refers.

Table 0.2 Magnitude of Landscape Impacts

Magnitude of Impact	Description
Very High	Change that would be large in extent and scale with the loss of critically important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to an extensive change of the landscape in terms of character, value and quality.
High	Change that would be more limited in extent and scale with the loss of important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to a considerable change of the landscape in terms of character, value and quality.
Medium	Changes that are modest in extent and scale involving the loss of landscape characteristics or elements that may also involve the introduction of new uncharacteristic elements or features that would lead to noticeable changes in landscape character, and quality.
Low	Changes affecting small areas of landscape character and quality, together with the loss of some less characteristic landscape elements or the addition of new features or elements that would lead to discernible changes in landscape character, and quality.
Negligible	Changes affecting small or very restricted areas of landscape character. This may include the limited loss of some elements or the addition of some new features or elements that are characteristic of the existing landscape or are hardly perceivable leading to no material change to landscape character, and quality.

The significance of a landscape impact is based on a balance between the sensitivity of the landscape receptor and the magnitude of the impact. The significance of landscape impacts is arrived at using the following matrix set out in **Table 0.3**.

Table 0.3 Impact Significance Matrix

	Sensitivity of Receptor				
Scale/Magnitude	*Very High*	*High*	*Medium*	*Low*	*Negligible*
Very High	Profound	Profound-substantial	Substantial	Moderate	Slight
High	Profound-substantial	Substantial	Substantial-moderate	Moderate-slight	Slight-imperceptible
Medium	Substantial	Substantial-moderate	Moderate	Slight	Imperceptible
Low	Moderate	Moderate-slight	Slight	Slight-imperceptible	Imperceptible
Negligible	Slight	Slight-imperceptible	Imperceptible	Imperceptible	Imperceptible

Note: The significance matrix provides an indicative framework from which the significance of impact is derived. The significance judgement is ultimately determined by the assessor using professional judgement. Due to nuances within the constituent sensitivity and magnitude judgements, this may be up to one category higher or lower than indicated by the matrix. Judgements indicated in orange are considered to be 'significant impacts' in EIA terms.

1.5.1.2 Visual Impact Assessment Criteria

As with the landscape impact, the visual impact of the proposed development will be assessed as a function of sensitivity versus magnitude. In this instance, the sensitivity of the visual receptor, weighed against the magnitude of the visual effect.

1.5.1.3 Sensitivity of Visual Receptors

Unlike landscape sensitivity, the sensitivity of visual receptors has an anthropocentric basis. It considers factors such as the perceived quality and values associated with the view, the landscape context of the viewer, the likely activity they are engaged in and whether this heightens their awareness of the surrounding landscape. A list of the factors considered by the assessor in estimating the level of sensitivity for a particular visual receptor is outlined below and used in Error! Reference source not f ound. below to establish visual receptor sensitivity at each VRP:

1.5.1.3.1 Susceptibility of Receptors

In accordance with the Institute of Environmental Management and Assessment ("IEMA") Guidelines for Landscape and Visual Assessment (3rd edition 2013) visual receptors most susceptible to changes in views and visual amenity are:

- *"Residents at home;*
- *People, whether residents or visitors, who are engaged in outdoor recreation, including use of public rights of way, whose attention or interest is likely to be focussed on the landscape and on particular views;*
- *Visitors to heritage assets, or to other attractions, where views of the surroundings are an important contributor to the experience;*

- *Communities where views contribute to the landscape setting enjoyed by residents in the area; and*
- *Travellers on road, rail or other transport routes where such travel involves recognised scenic routes and awareness of views is likely to be heightened*".

Visual receptors that are less susceptible to changes in views and visual amenity include;

- "*People engaged in outdoor sport or recreation, which does not involve or depend upon appreciation of views of the landscape; and*
- *People at their place of work whose attention may be focussed on their work or activity, not their surroundings and where the setting is not important to the quality of working life*".

1.5.1.3.2 Values Associated with Views

1. **Recognised scenic value of the view** (County Development Plan designations, guidebooks, touring maps, postcards etc). These represent a consensus in terms of which scenic views and routes within an area are strongly valued by the population because in the case of County Developments Plans, for example, a public consultation process is required;
2. **Views from within highly sensitive landscape areas**. Again, highly sensitive landscape designations are usually part of a county's Landscape Character Assessment, which is then incorporated within the County Development Plan and is therefore subject to the public consultation process. Viewers within such areas are likely to be highly attuned to the landscape around them;
3. **Primary views from dwellings**. A proposed development might be seen from anywhere within a particular residential property with varying degrees of sensitivity. Therefore, this category is reserved for those instances in which the design of dwellings or housing estates, has been influenced by the desire to take in a particular view. This might involve the use of a slope or the specific orientation of a house and/or its internal social rooms and exterior spaces;
4. **Intensity of use, popularity**. This relates to the number of viewers likely to experience a view on a regular basis and whether this is significant at county or regional scale;
5. **Connection with the landscape**. This considers whether or not receptors are likely to be highly attuned to views of the landscape i.e. commuters hurriedly driving on busy national route versus hill walkers directly engaged with the landscape enjoying changing sequential views over it;

6. **Provision of elevated panoramic views**. This relates to the extent of the view on offer and the tendency for receptors to become more attuned to the surrounding landscape at locations that afford broad vistas;
7. **Sense of remoteness and/or tranquillity.** Receptors taking in a remote and tranquil scene, which is likely to be fairly static, are likely to be more receptive to changes in the view than those taking in the view of a busy street scene, for example;
8. **Degree of perceived naturalness**. Where a view is valued for the sense of naturalness of the surrounding landscape it is likely to be highly sensitive to visual intrusion by distinctly manmade features;
9. **Presence of striking or noteworthy features.** A view might be strongly valued because it contains a distinctive and memorable landscape feature such as a promontory headland, lough or castle;
10. **Historical, cultural and / or spiritual significance.** Such attributes may be evident or sensed by receptors at certain viewing locations, which may attract visitors for the purposes of contemplation or reflection heightening the sense of their surroundings;
11. **Rarity or uniqueness of the view**. This might include the noteworthy representativeness of a certain landscape type and considers whether the receptor could take in similar views anywhere in the broader region or the country;
12. **Integrity of the landscape character**. This looks at the condition and intactness of the landscape in view and whether the landscape pattern is a regular one of few strongly related components or an irregular one containing a variety of disparate components;
13. **Sense of place**. This considers whether there is special sense of wholeness and harmony at the viewing location; and
14. **Sense of awe**. This considers whether the view inspires an overwhelming sense of scale or the power of nature.

Those locations which are deemed to satisfy many of the above criteria are likely to be of higher sensitivity. No relative importance is inferred by the order of listing in the Error! Reference source not f ound.. Overall sensitivity may be a result of a number of these factors or, alternatively, a strong association with one or two in particular.

1.5.1.4 Visual Impact Magnitude

The magnitude of visual effects is determined on the basis of two factors; the visual presence (relative visual dominance) of the proposal and its effect on visual amenity.

Visual presence is a somewhat quantitative measure relating to how noticeable or visually dominant the proposal is within a particular view. This is based on a number of aspects, aside from scale in relation to distance. Some of these aspects include the extent and complexity of the view, as well as the degree of existing contextual movement experienced. The backdrop against which the development is presented and its relationship with other focal points or prominent features within the view is also considered. Visual presence is essentially a measure of the relative visual dominance of the proposal within the available vista and is often, though not always, expressed as one of the following terms:

- Minimal;
- Sub-dominant;
- Co-dominant;
- Dominant;
- Highly dominant.

The magnitude of visual impacts is classified in **Table 0.4**.

Table 0.4 Magnitude of Visual Impact

Criteria	Description
Very High	The proposal obstructs or intrudes into a large proportion or critical part of the available vista and is without question the most noticeable element. An extensive degree of visual change will occur within the scene completely altering its character, composition and associated visual amenity
High	The proposal obstructs or intrudes into a significant proportion or important part of the available vista and is one of the most noticeable elements. A considerable degree of visual change will occur within the scene substantially altering its character, composition and associated visual amenity
Medium	The proposal represents a moderate intrusion into the available vista and is a readily noticeable element. A noticeable degree of visual change will occur within the scene perceptibly altering its character, composition and associated visual amenity
Low	The proposal intrudes to a minor extent into the available vista and may not be noticed by a casual observer and/or the proposal would not have a marked effect on the visual amenity of the scene
Negligible	The proposal would be barely discernible within the available vista and/or it would not influence the visual amenity of the scene

1.5.1.5 Visual Impact Significance

As stated above, the significance of visual impacts is a function of visual receptor sensitivity and visual impact magnitude. This relationship is expressed in the same significance matrix and applies the same EPA definitions of significance as used earlier in respect of landscape impacts (**Table 0.3** refers).

1.5.1.6 Quality and Timescale of Effects

In addition to assessing the significance of landscape effects and visual effects, EPA Guidance for EIAs requires that the quality of the effects is also determined. This could be negative/adverse, neutral, or positive/beneficial. In the case of new energy / infrastructure developments within rural and semi-rural settings, the landscape and visual change brought about by an increased scale and intensity of built form is seldom considered to be positive / beneficial.

Landscape and Visual effects are also categorised according to their duration:

- Temporary – Lasting for one year or less;
- Short Term – Lasting one to seven years;
- Medium Term – Lasting seven to fifteen years;
- Long Term – Lasting fifteen years to sixty years; and
- Permanent – Lasting over sixty years.

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LVIA PHOTOMONTAGES

N11_N4 Ashford, Park and Ride

This book contains imagery for the viewpoints chosen for the LVIA study

June 2024

INDEX

Viewpoint 1 - Existing View + Outline View
NB - There is no Montage View for this viewpoint

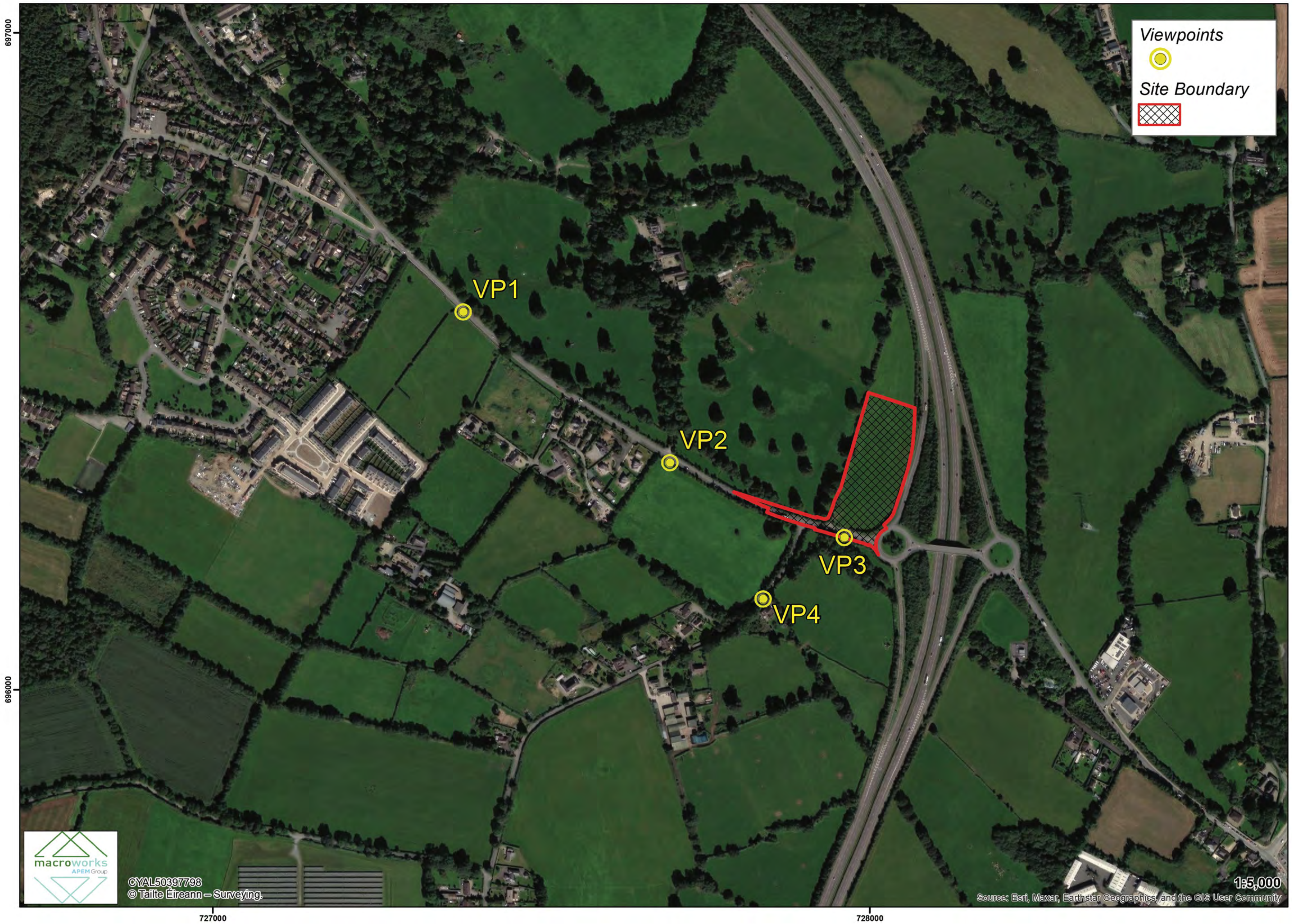
Viewpoint 2 - Existing View + Outline View
NB - There is no Montage View for this viewpoint

Viewpoint 3a - Existing View + Outline View
Viewpoint 3a - Montage View

Viewpoint 3b - Existing View + Outline View
Viewpoint 3b - Montage View

Viewpoint 4 - Existing View + Outline View
NB - There is no Montage View for this viewpoint

Viewpoint locations selected for the Ashford N11 Park and Ride project



N11_N4 Ashford, Park and Ride

Imagery depicting the view towards the site (Existing and Outline)

These are 80° panoramic montages captured and presented in accordance with the guidance set by the British Landscape Institute 2011 - Advice Note 01/11.

To view these panoramas on a flat surface one must move from left to right along its length whilst maintaining a perpendicular viewing direction and the specified correct viewing distance of 30cm. To see this entire panoramic scene in reality would necessitate turning one's head through 40°.

Easting (ITM):	727381	Lens:	50mm / Full Frame Sensor	Date:	15/09/2022
Northing (ITM):	696575	Camera:	Canon 1-D Mark II digital SLR	Time:	14:05
Direction of View 110°	E of Grid North	Camera Height:	1.7m Above Ground Level		
Angle of View:	80°				

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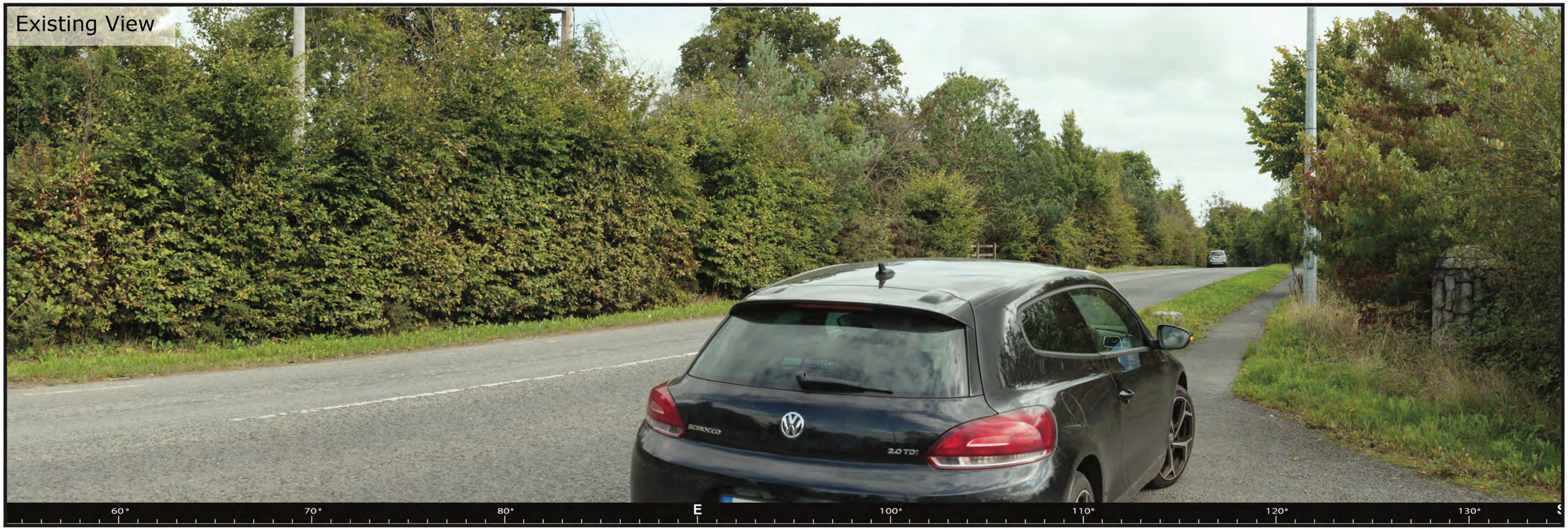
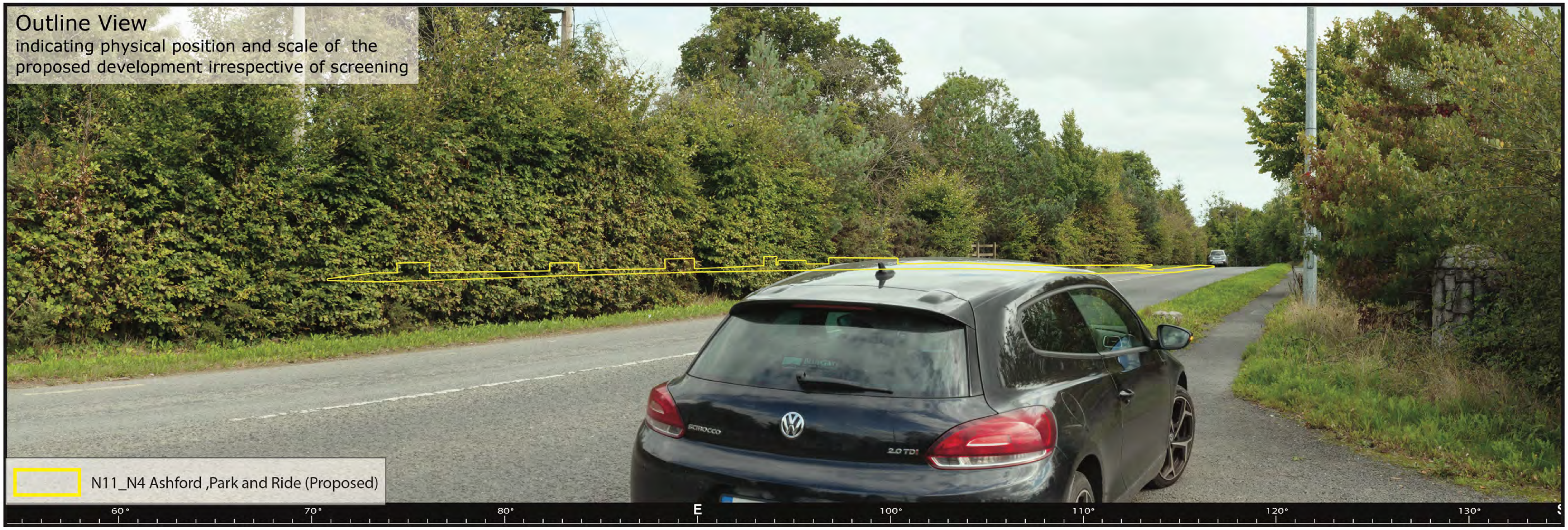
N11_N4 Ashford, Park and Ride

Imagery depicting the view towards the site (Existing and Outline)





These are 80° panoramic montages captured and presented in accordance with the guidance set by the British Landscape Institute 2011 - Advice Note 01/11.

To view these panoramas on a flat surface one must move from left to right along its length whilst maintaining a perpendicular viewing direction and the specified correct viewing distance of 30cm. To see this entire panoramic scene in reality would necessitate turning one's head through 40°.

Easting (ITM):	727696	Lens:	50mm / Full Frame Sensor	Date:	15/09/2022
Northing (ITM):	696345	Camera:	Canon 1-D Mark II digital SLR	Time:	14:15
Direction of View	95° E of Grid North	Camera Height:	1.7m Above Ground Level		
Angle of View:	80°				

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N11_N4 Ashford, Park and Ride

Imagery depicting the view towards the site (Existing and Outline)

These are 120° panoramic montages captured and presented in accordance with the guidance set by the British Landscape Institute 2011 - Advice Note 01/11.

To view these panoramas on a flat surface one must move from left to right along its length whilst maintaining a perpendicular viewing direction and the specified correct viewing distance of 30cm. To see this entire panoramic scene in reality would necessitate turning one's head through 80°.

Easting (ITM):	727961	Lens:	50mm / Full Frame Sensor	Date:	15/09/2022
Northing (ITM):	696232	Camera:	Canon 1-D Mark II digital SLR	Time:	14:20
Direction of View	320NW of Grid North	Camera Height:	1.7m Above Ground Level		
Angle of View:	120°				

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N11_N4 Ashford, Park and Ride

Imagery depicting the view towards the site (Montage pre- and post-mitigation establishment)

These are 120° panoramic montages captured and presented in accordance with the guidance set by the British Landscape Institute 2011 - Advice Note 01/11.

To view these panoramas on a flat surface one must move from left to right along its length whilst maintaining a perpendicular viewing direction and the specified correct viewing distance of 30cm. To see this entire panoramic scene in reality would necessitate turning one's head through 80°.

Easting (ITM):	727961	Lens:	50mm / Full Frame Sensor	Date:	15/09/2022
Northing (ITM):	696232	Camera:	Canon 1-D Mark II digital SLR	Time:	14:20
Direction of View	320°NW of Grid North	Camera Height:	1.7m Above Ground Level		
Angle of View:	120°				

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Existing View

Outline View

indicating physical position and scale of the proposed development irrespective of screening

N11_N4 Ashford, Park and Ride (Proposed)

These are 120° panoramic montages captured and presented in accordance with the guidance set by the British Landscape Institute 2011 - Advice Note 01/11.

To view these panoramas on a flat surface one must move from left to right along its length whilst maintaining a perpendicular viewing direction and the specified correct viewing distance of 30cm. To see this entire panoramic scene in reality would necessitate turning one's head through 80°.

Easting (ITM):	727961	Lens:	50mm / Full Frame Sensor	Date:	15/09/2022
Northing (ITM):	696232	Camera:	Canon 1-D Mark II digital SLR	Time:	14:20
Direction of View	70° E of Grid North	Camera Height:	1.7m Above Ground Level		
Angle of View:	120°				

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Montage View

These are 120° panoramic montages captured and presented in accordance with the guidance set by the British Landscape Institute 2011 - Advice Note 01/11.

To view these panoramas on a flat surface one must move from left to right along its length whilst maintaining a perpendicular viewing direction and the specified correct viewing distance of 30cm. To see this entire panoramic scene in reality would necessitate turning one's head through 80°.

Easting (ITM):	727961	Lens:	50mm / Full Frame Sensor	Date:	15/09/2022
Northing (ITM):	696232	Camera:	Canon 1-D Mark II digital SLR	Time:	14:20
Direction of View	70° E of Grid North	Camera Height:	1.7m Above Ground Level		
Angle of View:	120°				

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Imagery depicting the view towards the site (Existing and Outline)

These are 80° panoramic montages captured and presented in accordance with the guidance set by the British Landscape Institute 2011 - Advice Note 01/11.

To view these panoramas on a flat surface one must move from left to right along its length whilst maintaining a perpendicular viewing direction and the specified correct viewing distance of 30cm. To see this entire panoramic scene in reality would necessitate turning one's head through 40°.

Easting (ITM):	727837	Lens:	50mm / Full Frame Sensor	Date:	15/09/2022
Northing (ITM):	696138	Camera:	Canon 1-D Mark II digital SLR	Time:	14:29
Direction of View	30°NE of Grid North	Camera Height:	1.7m Above Ground Level		
Angle of View:	80°				

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