Appendix 11.1

Traffic & Transport Assessment & Outline Mobility Management Plan

Large Scale Residential Development, Arklow Co. Wicklow
Reference number IE01T24A28

16/05/2025

TRAFFIC & TRANSPORT ASSESSMENT & OUTLINE MOBILITY MANAGEMENT PLAN

SYSTRA

LARGE SCALE RESIDENTIAL DEVELOPMENT, ARKLOW CO. WICKLOW

TRAFFIC & TRANSPORT ASSESSMENT & OUTLINE MOBILITY MANAGEMENT PLAN

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1.1 Background

1.1.1 SYSTRA Ltd has been commissioned by Certain Assets of Dawnhill and Windhill Ltd (CADW) to prepare a Traffic & Transport Assessment (TTA) and Outline Mobility Management Plan (OMMP) in relation to a proposed Large Scale Residential Development (LRD) in Kilbride, Arklow, Co. Wicklow. An Environmental Impact Assessment Report (EIAR) accompanies the application, to which this TTA report has been appended.

1.1.2 The site location is shown in **Figure 1**.

Figure 1. Site Location and Site Boundary

1.1.3 The development site is located on the northern side of the Avoca River in Arklow, Co. Wicklow, within the development boundary of Arklow Town, in the townland of Kilbride.

1.1.4 The site is currently greenfield and used for agricultural purposes. It is bounded to the north by the L6179 Kilbride Road, to the west by the M11 motorway and other undeveloped lands, to the south by the Avoca River marsh and to the east by residential developments and additional undeveloped lands. The site does not currently have a formal access point.

1.2 Site Designation

1.2.1 The site forms part of a wider landholding which is designated within the Arklow and Environs Local Area Plan (LAP) 2018-2024 as Action Area Plan 3 (AAP3). The LAP notes that, "*Kilbride (AAP3) is identified as the location of major development in Arklow; the growth of the settlement in accordance with regional plan targets is contingent on the delivery of the major residential, employment and community services development at this location*"

1.3 Development Overview

1.3.1 A planning application was submitted by CADW in October 2023 for 86 no. residential units as part of an initial phase of development (Ref. 23/745) on the Masterplan site. The application was consented by Wicklow County Council in April 2024, with a slight reduction to 84 units in total.

1.3.2 The planning application to which this TTA relates is for development proposals comprising a total of 666 residential units with accompanying commercial/community/medical centre and crèche facilities. The 84-unit development has been included within the analysis as a committed scheme – collectively a total of 750 units will be developed at the site as part of both schemes.

1.3.3 It is envisaged that the wider AAP3 site will be progressed in two distinct phases, each with standalone planning applications; the proposed development therefore represents Phase 1 of the proposals, comprising 666 residential units and ancillary commercial/community/medical centre and crèche facilities, with supporting infrastructure including the construction of a new internal access road to serve the site.

1.3.4 Forthcoming Phase 2 proposals developed as part of a wider masterplan for the lands are expected to include the development of the wider AAP site to provide further residential units, ancillary services and continuation of the new access road within the site boundary.

1.4 Relevant Planning History

1.4.1 The following consented developments within the AAP3 site are of relevance:

Education Campus

1.4.2 A new school campus for Gaelcholáiste na Mara and Gaelscoil an Inbhir Mhóir within the AAP3 site was granted planning permission in August 2022 (Ref: 22/213). SYSTRA understands that the education campus is still in the design process, and a date for construction has yet to be set. The Campus layout is shown in **Figure 2**.

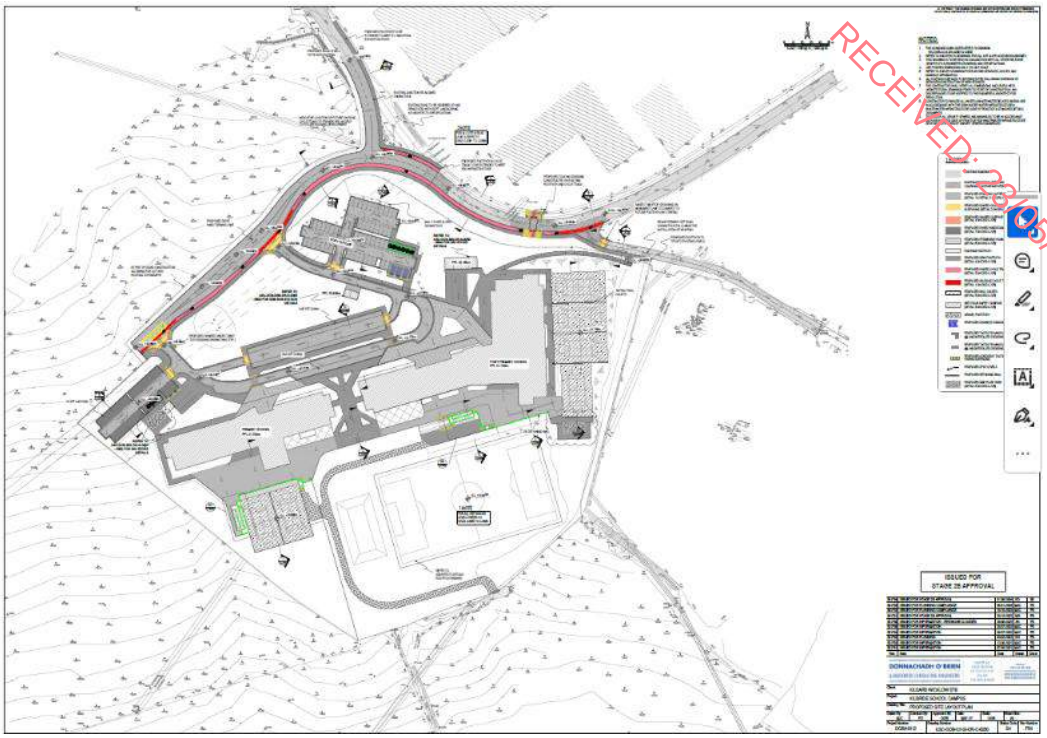


Figure 2. Proposed Education Campus within Kilbride lands

1.4.3 Access to the school will be taken from a new access road from the existing Kilbride Road, which is intended to form part of the future IT5 Western Distributor Route alignment. The proposed Phase 1 LRD development will itself be accessed from this new access road that will pass along the school site boundary (i.e. both sites will share a common access route).

84-Unit Residential Development

1.4.4 A planning application was submitted by CADW in October 2023 for 86 no. residential units as part of an initial phase of development (Ref. 23/745). The application was consented by Wicklow County Council in April 2024, with a slight reduction to 84 units in total.

1.4.5 The residential site is located to the south of the educational campus site and has been developed to complement the campus, with both developments taking access from the internal spine road.

1.4.6 This residential development will also provide a pedestrian and cyclist connection through to the R772, Dublin Road via Avondale Crescent.

1.4.7 The 84 units granted as part of Application 23/745 will be delivered in tandem with the Phase 1 site development that is the subject of this LRD application (specifically, forming Character Area 1A of the Phase 1 lands as detailed below).

1.4.8 These 84 units and accompanying supporting infrastructure are additional to the 666 residential units proposed, resulting in an overall total of 750 residential units. The 84-unit development has been included within the analysis as a committed scheme.

1.5 Summary

1.5.1 **Figure 2** shows the Phase 1 proposed development (666 units), the consented Phase 1a application (84-units), and the consented education campus.

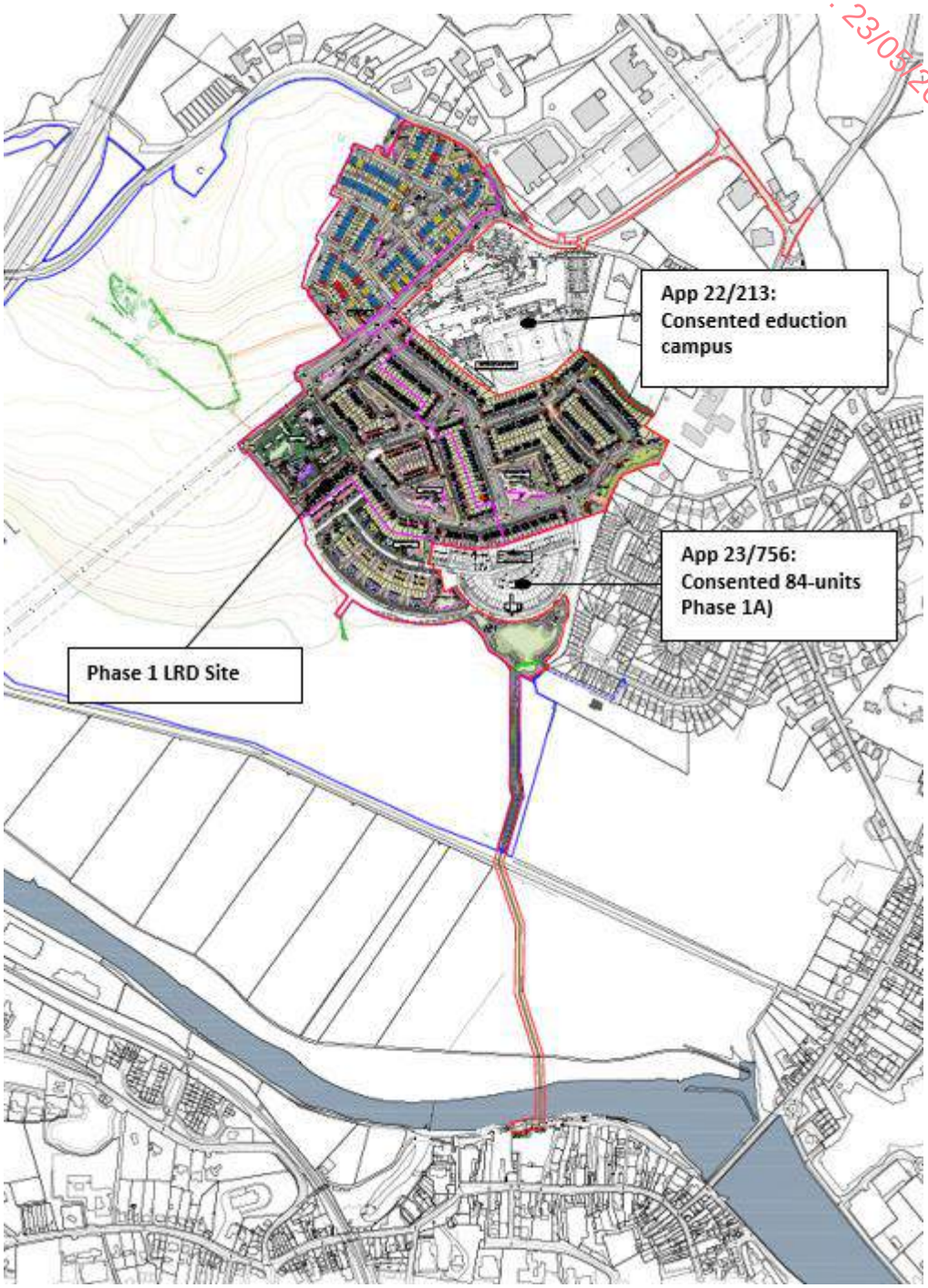


Figure 3. Phase 1 Site and adjacent Committed Developments

1.6 Purpose of the TA

1.6.1 The purpose of this report is to set out the likely transport impacts of the proposals, and to identify measures to ensure that the development can be successfully integrated into the local transport network.

1.6.2 The report describes and evaluates the baseline transport environment, forecasts multi-modal travel demand from the proposed development, and assesses the potential impact of this demand on the surrounding network.

1.6.3 The report also considers the impact of the consented school campus, and the effects of future transport proposals in Arklow such as the Western Distributor Route and a proposed boardwalk connection across the Avoca River between Kilbride lands and the town centre.

1.7 Consultation

1.7.1 The following Pre-Application consultation has been undertaken with Wicklow County Council:

- A Section 247 (S247) was held with Wicklow County Council on the 15th May 2024 under Reg. Ref. LRDPP24/31. During this meeting the principle of the development was discussed, along with the connections to Uisce Éireann Network, links into the town centre, tree retention and the future LAP.
- A Stage 2 LRD meeting was held with Wicklow County Council on the 18th December, 2024 under the same reference. At this meeting, a formal opinion response was received from WCC regarding the Stage 2 documentation submitted.

1.7.2 The specific items raised as part of this opinion document as they pertain to this TTA have been considered in this assessment, as follows:

1. **Potential Impact of not achieving the 'Target' mode split proposed:** For the proposed opening year of the development, in 2027, the vehicle mode share has been retained at the prevailing value of 70%, to reflect the phased delivery of the Local Centre and Boardwalk connection within the overall site build-out. In addition, a sensitivity test has been undertaken for the Dublin Road/Beech Road junction for a scenario where the prevailing mode share of 70% is retained, as opposed to the target mode share of 55% (for private vehicles). The results of this assessment are contained in Appendix E; and
2. **Beech Road/Dublin Road Junction:** Lane widths have been reviewed and confirmed, and additional commentary has been added regarding the potential impact of queuing lengths at the junction.

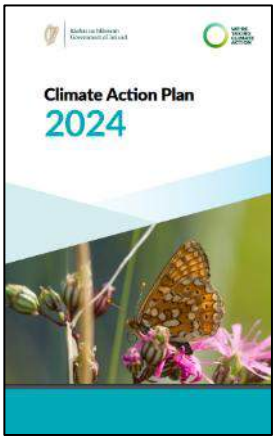
2. PLANNING AND POLICY REVIEW

2.1 Overview

2.1.1 This chapter provides a summary of the transport plans, policies, and objectives that are most relevant to the development. They have been considered at the National, Regional and Local levels.

2.2 National Level

Climate Action Plan 2024



2.2.1 The Climate Action Plan 2024 (CAP24) is the third annual update to Ireland's Climate Action 2019. This plan is the first to be prepared under the Climate Action and Low Carbon Development (Amendment) Act 2021, and following the introduction, in 2022, of economy-wide carbon budgets and sectoral emissions ceilings.

2.2.2 The plan implements the carbon budgets and sectoral emissions ceilings and sets out a roadmap for taking decisive action to halve our emissions by 2030, and reach net zero no later than 2050, as committed to in the Programme for Government. CAP24 sets out how Ireland can accelerate the actions that are required to respond to the climate crisis, putting climate solutions at the centre of Ireland's social and economic development.

2.2.3 In terms of transport, CAP24 pledges to adopt the 'Avoid – Shift – Improve' approach, and targets a 50% reduction in emissions by 2030. It also aims to:

- Reduce the total distance driven across all journeys by **20%.**
- Ensure there is a significant behavioural shift towards walking, cycling and public transport.

2.2.4 With particular relevance to this residential development, CAP24 seeks to:

- TR/24/8: Support and promote a modal shift towards healthy active and sustainable mobility in the design and delivery of LDA development.
- TR/24/11 (TF): Advance roll-out of walking/cycling infrastructure in line with National Cycle Network and CycleConnects plans.
- TR/24/16 (TF): Prioritise and accelerate delivery of NTA Connecting Ireland and new town services, via demand responsive transport pilot initiatives, conventional and non-conventional modes of public transport services.

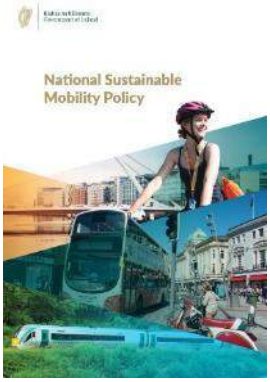
Ireland 2040 Our Plan: National Planning Framework

2.2.5 The National Policy Framework (NPF) outlines the new strategic planning and development strategy for the whole of Ireland and all its regions for the next 20 years. The document co-

ordinates National, Regional and Local Authority policies and activities through one central strategy, providing a reference point to adhere to.

National Sustainable Mobility Policy (2022)

2.2.6 The National Sustainable Mobility Policy sets out a strategic framework to 2030 for active travel (walking and cycling) and public transport journeys to help Ireland meet its climate obligations.



2.2.7 The policy aims to deliver at least 500,000 additional daily active travel and public transport journeys by 2030 and a 10% reduction in the number of kilometres driven by fossil fuelled cars. It will make it easier for people to choose walking, cycling and use public transport daily instead of having to use a petrol or diesel car.

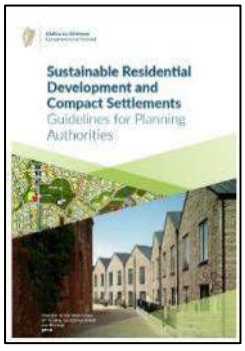
The policy aims to make it easier for people to choose walking, cycling and use public transport daily instead of having to use a petrol or diesel car under the following key themes:

- Safe and Green mobility.
- People focused mobility.
- Better integrated mobility.

2.2.8 With particular relevance to the development, the sustainable mobility policy seeks to expand walking, cycling and public transport infrastructure across the country, and improve the safety of walking, cycling and public transport networks.

Sustainable Residential Development and Compact Settlements Guidelines for Planning Authorities

2.2.9 Published in 2024, the Guidelines expand on higher-level policies of the National Planning Framework, setting policy and guidance in relation to the growth priorities for settlements, residential density, urban design and placemaking and introduce development standards for housing.



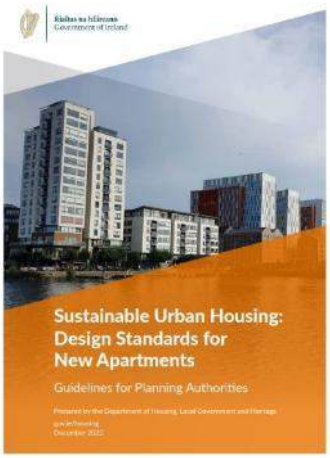
2.2.10 The density ranges support the application of densities that respond to settlement size and to different place contexts, recognising in particular the differences between cities, large and medium sized towns and smaller towns and villages.

2.2.11 The key indications of Quality Design and Placemaking set out in Guidelines are:

- **Sustainable and Efficient Movement** - Ensuring places are well connected and accessible by sustainable modes. Also acknowledging that quality of journey is equally important and that places are perceived as safe and are not dominated cars.
- **Mix and Distribution of Uses** - Promoting the integration of land uses and transportation and a diverse and innovative mix of housing that can facilitate compact housing and provide greater housing choice.

- **Green and Blue Infrastructure** - Placing and emphasis on the protection of natural assets and biodiversity, whilst also taking a more strategic view as to how open space networks are formed to balance the needs of communities.
- **Responsive Built Form** - Placing an emphasis on the creation of a coherent urban structure and design approach that responds to local character and is attractive.

Sustainable Urban Housing: Design Standards for New Apartments 2022 (DSFNA) Guidelines for Planning Authorities



2.2.12 The 'Sustainable Urban Housing: Design Standards for New Apartments (DSFNA) – Guidelines for Planning Authorities' was published by the Department of Housing, Planning and Local Government in March 2018, and updated most recently in 2022.

2.2.13 Based on the NPF projections there is a need to build 550,000 new households nationally by 2040 to accommodate a 1 million person increase in population. The objective is for these new households to be located in as sustainable a location as possible within our towns and cities to address increasing pollution and commuting times and enable the state to feasibly provide and justify supporting infrastructure.

2.2.14 For large scale, higher density residential developments located within an accessible urban location the guidelines state that "the default policy is for car parking provision to be minimised, substantially reduced or wholly eliminated in certain circumstances." This policy is particularly applicable in highly accessible areas at a confluence of public transport systems such rail and bus stations located in close proximity.

2.2.15 The criteria for these locations is to be within a 15-minute walk of the city centre, 10-minute walk to rail or tram or 5-minute walk to high frequency (10min peak hour frequency) bus services. The Holy Cross College Lands delivers on the latter two and is just a 20-minute walk from the city centre.

2.2.16 In suburban/urban locations served by public transport or close to town centres or employment areas and particularly for high density housing schemes, the guidance states that planning authorities must consider a reduced overall car parking standard and apply an appropriate maximum car parking standard.

2.2.17 With respect to Mobility Management, the guidance goes on to state:

2.2.18 "*As well as showing that a site is sufficiently well located in relation to employment, amenities and services, it is important that access to a car sharing club or other non-car based modes of transport are available and/or can be provided to meet the needs of residents, whether as part of the proposed development, or otherwise*".

Design Manual for Urban Roads & Streets (Updated 2019)

2.2.19 The primary objective of the Design Manual for Urban Roads & Streets (DMURS), published by the Department of Transport, is to set out an integrated design approach for streets in urban areas which balances the needs of all users, and is influenced by the surrounding context of the street. The manual aims to promote a sustainable approach to design which promotes real alternatives to the car. To achieve this the needs of sustainable modes must be considered before that of the private car. This is outlined in the user shown in **Figure 4.**

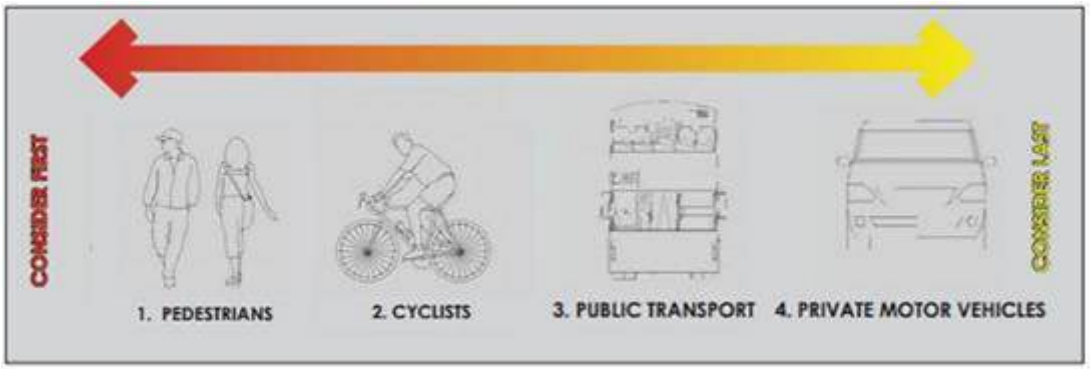


Figure 4. DMURS User Hierarchy

Cycle Design Manual (2023)

2.2.20 The Cycle Design Manual (a comprehensive update to the National Cycle Manual) was published by the National Transport Authority (NTA) in 2023 and overseen by the Department of Transport.

2.2.21 It is guided by the need to deliver safe cycle facilities for people of all ages and abilities. The new manual places more emphasis on the range of cycles that cycle infrastructure will have to accommodate and the recommendations focus on segregating cyclists from traffic where speeds and volumes make roads unsuitable for sharing. There is also a general presumption towards segregating pedestrians and cyclists where possible.

2.3 Regional Context

Regional Spatial and Economic Strategy (RSES) for the Eastern and Midland Region 2019 - 2031

2.3.1 This Transport Strategy defines the objective of transport investment as, “to contribute to economic, social and cultural progress of the Region, and the protection and enhancement of the environment, in line with Government priorities in other sectors. The success of transport planning in meeting society’s needs requires close integration of transport investment and land use planning, to guide the direction of future development within the Region.”

2.4 Local Context

Wicklow County Development Plan 2022-2028

2.4.1 The current Wicklow County Development Plan (CDP) (2022-2028) outlines ten Strategic County Outcomes (SCOs) which are "informed by the National Planning Framework, the Regional, Spatial and Economic Strategy and the key issues arising in submissions from members of the public." The following are those that relate to sustainable transport and mobility objectives for the county.

2.4.2 **SC01; Sustainable Settlement Patterns & Compact Growth:** The delivery of compact growth in all towns and villages by capitalising on the potential for infill and brownfield development, moving away from a reliance on greenfield development and creating places that encourage active lifestyles is essential for the successful delivery of the development plan strategy.

2.4.3 **SC05; Sustainable Mobility:** The County Development Plan plays an important role in influencing a reduction in GHG emissions by guiding the sustainable growth of the County. The integration of land use and transportation planning, in order to support sustainable mobility and encourage a shift away from the private car to active travel (walking and cycling) and public transport, will deliver improvements in terms of quality of life and climate change.

2.4.4 **SC07; Climate Resilience & the Transition to a Low Carbon Economy** Support the transition to low carbon clean energy by facilitating renewable energy use and generation at appropriate locations and supporting the development of off-shore renewable energy enabling infrastructure especially at ports and harbours. Facilitate the sustainable management of waste including the circular economy. Restrict development in areas that are at risk of flooding and protect the natural landscape and biodiversity.

Arklow Local Area Plan (2018-2024)

2.4.5 Wicklow County Council have commenced preparation of the new Arklow Local Area Plan, and issued a pre-draft paper inviting submissions in March-April 2024. A draft LAP is expected to supersede the current LAP in late 2025.

2.4.6 The site is therefore part of the prevailing Arklow and Environs Local Area Plan (LAP) 2018-2024 and is designated within the LAP as part of Action Area Plan 3 (AAP3).

2.4.7 The subject site is zoned '*Mixed Use'*. **Figure 5** below, extracted from the LAP illustrates the zoning for AAP3, identifying Kilbride as a location for major development in Arklow and as one of the most suitable lands in the environs of Arklow for large scale development.

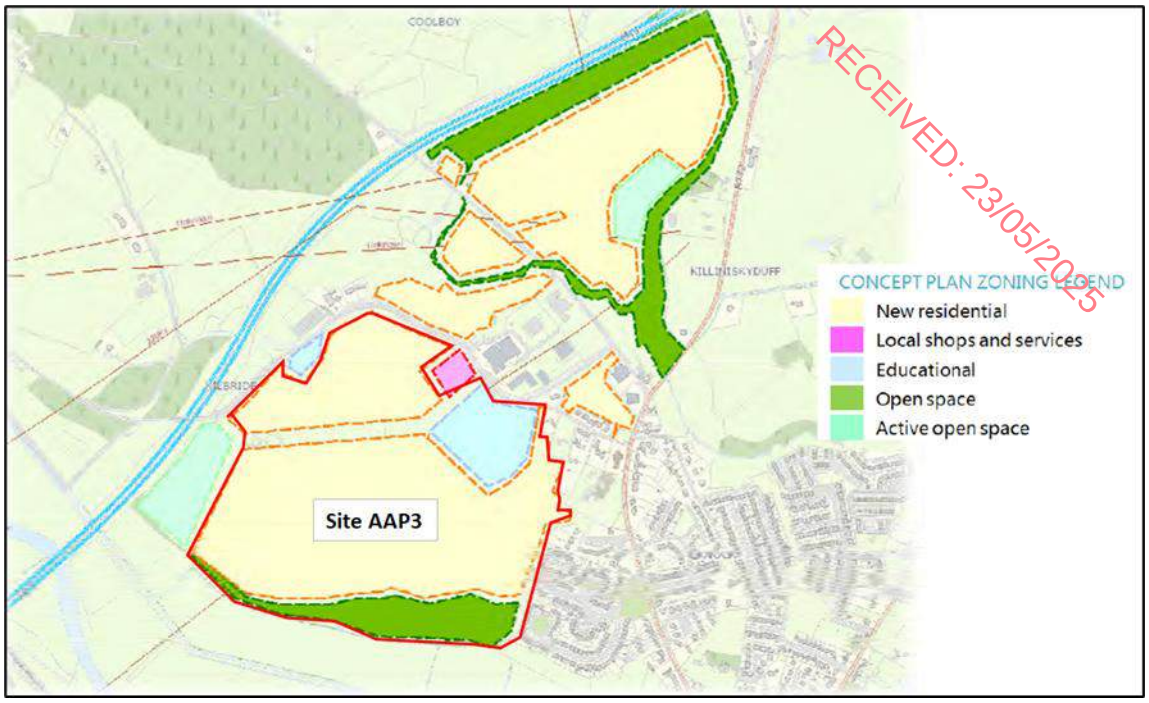


Figure 5. Arklow LAP 2018-2024 - Zoning Designation for AAP3 & AAP4 lands at Kilbride

2.4.8 Site AAP3 is identified in the current LAP as suitable for the implementation of a maximum of 1,500 residential units, with accompanying community, local shops/services and open space areas and an objective to implement a school campus.

2.4.9 Infrastructure, transportation and movement objectives outlined in the LAP are as follows:

- **IT2**; To improve, as funding allows, the principal access routes into the town centre from surrounding tourism locations, particular the Coast Road north of the town, the Clogga Road, the Vale Road and access to potential north quay developments.
- **IT3**; To promote and encourage the "Safer Routes to School" and the Green Schools Programme within Arklow and to liaise with all relevant Departments/agencies involved in the operation of the programme.
- **IT5**; To facilitate the provision of a western distributor route in order to provide alternative movement routes through the town. The route, which will be subject to route option assessment, will incorporate a new river crossing, linking Kilbride to the Vale Road, Lamberton Avenue and on to the Coolgreaney Road.
- **IT8**; To facilitate the operation and free flow of traffic in a safe manner in particular in the town centre and in locations proximate to schools, health and community facilities, by appropriately controlling car parking at such locations.
- **IT15**; To facilitate the implementation of the GDA Cycle Network Plan.

3. TRANSPORT BASELINE

3.1 Pedestrian & Cycle Infrastructure

Current Facilities

3.1.1 As a greenfield site, existing footpaths and cycle facilities are currently limited to those on or alongside the roads around the site. These include:

- A continuous shared footway/cycleway along a portion of the northern side of Kilbride Road, commencing in the vicinity of the proposed site access road junction and continuing east and terminating approximately 80m from the junction with the Beech Road.
- Footways of varying quality and width on both sides of the Beech Road between the junctions with Kilbride Road and the Dublin Road.
- A pedestrian and cycle facility on the R772 Dublin Road, commencing approximately 100m north of the junction with Beech Road and continuing to the M11 Junction 11 to the north (the Arklow North Pedestrian & Cycle scheme).
- Footways of varying widths on both sides of R772 Dublin Road and Ferrybank Road between the junction with Beech Road and the Bridgewater Roundabout to the south. A signalised pedestrian crossing is provided outside St. Joseph's National school on the R772 Dublin Road.

3.2 Bus Services

3.2.1 The closest bus services to the site run along the R772 Dublin Road. These are:

- Bus Eireann Service 2, which operates between Dublin Airport, Arklow and Wexford at an hourly frequency throughout the week.
- Wexford Bus Service 740A, which operates between Arklow, Wicklow Town and Dublin Airport, also on an hourly basis throughout the week.

3.2.2 The Connecting Ireland Rural Mobility Plan is a major national public transport initiative developed by the National Transport Authority (NTA), with the aim of increasing connectivity, particularly for people living outside our major cities and towns. The proposals for Arklow include:

- Better integration of routes between Wicklow and Dublin, with a minimum service frequency of 30 minutes.
- A new local route from Sallins to Arklow via Naas, Blessington, Glendalough, Wicklow and Rathdrum.

3.2.3 It is also understood that the NTA is considering the introduction of a town bus service, that would serve Arklow, as part of the development of the Arklow Local Transport Plan to accompany the upcoming update to the Arklow Local Area Plan.

3.3 Rail Services

3.3.1 Arklow Train Station is located in the centre of the town, approximately 3.2km from the site access on Kilbride Road, but approximately 650m from the proposed landing point of the

Avoca River crossing on River Walk (approximately a 10-minute walk or a 4-minute cycle from this location).

Figure 6. Arklow Train Station location – site context

3.3.2 The station is served by the Dublin Connolly-Rosslare service and the DART Commuter service. The following services operate during the working week:

- 6 trains per day to Dublin Connolly (one continuing to Dundalk Clarke).
- 4 trains per day to Rosslare Europort.
- 1 train per day to Wexford O'Hanrahan.
- 1 train per day to Gorey.

3.4 Road Infrastructure

Current Network

3.4.1 **Figure 7** shows the local road network, and key junctions in the vicinity of the site. The wider road network is shown in **Figure 11** later in this section.

Figure 7. Local Road Network

3.4.2 **Figure 8** shows the R772 Dublin Road / Beech Road priority junction.

Figure 8. R772 Dublin Road / Beech Road junction

3.4.3 Beech Road is a single-carriageway road that runs in a north-westerly direction from R772 Dublin Road, passing over the M11, and linking Ticknock with Avoca. Between the R772 Dublin Road and Kilbride Road it has a speed limit of 50km/h, but beyond this a speed limit of 80km/h applies. **Figure 9** shows the Beech Road / Kilbride Road priority junction, where Kilbride Road forms the minor arm.

Figure 9. Beech Road / Kilbride Road Junction

3.4.4 Kilbride Road is a single carriageway road, with a speed limit of 50km/h. It runs east-west between Beech Road and the Avoca River Business Park, at which point the public road ends.

Figure 10. View of Kilbride Road, travelling west

3.1 Traffic Flows

3.1.1 As part of a suite of data collection, Junction Turning Counts (JTC's) were collected at the following junctions (as shown in **Figure 10**), on Tuesday, September 3rd, 2024:

- M11 / R772 roundabouts (north and south roundabouts and slips).
- R772 Dublin Rd / L2180 Beech Rd priority junction.
- R772 Dublin Rd / De Wadden Drive priority junction.
- R772 Dublin Rd / R750 Sea Rd priority junction.
- R772 / North Quay roundabout junction.
- R772 Bridge St / Main St / Lower Main St priority junction.

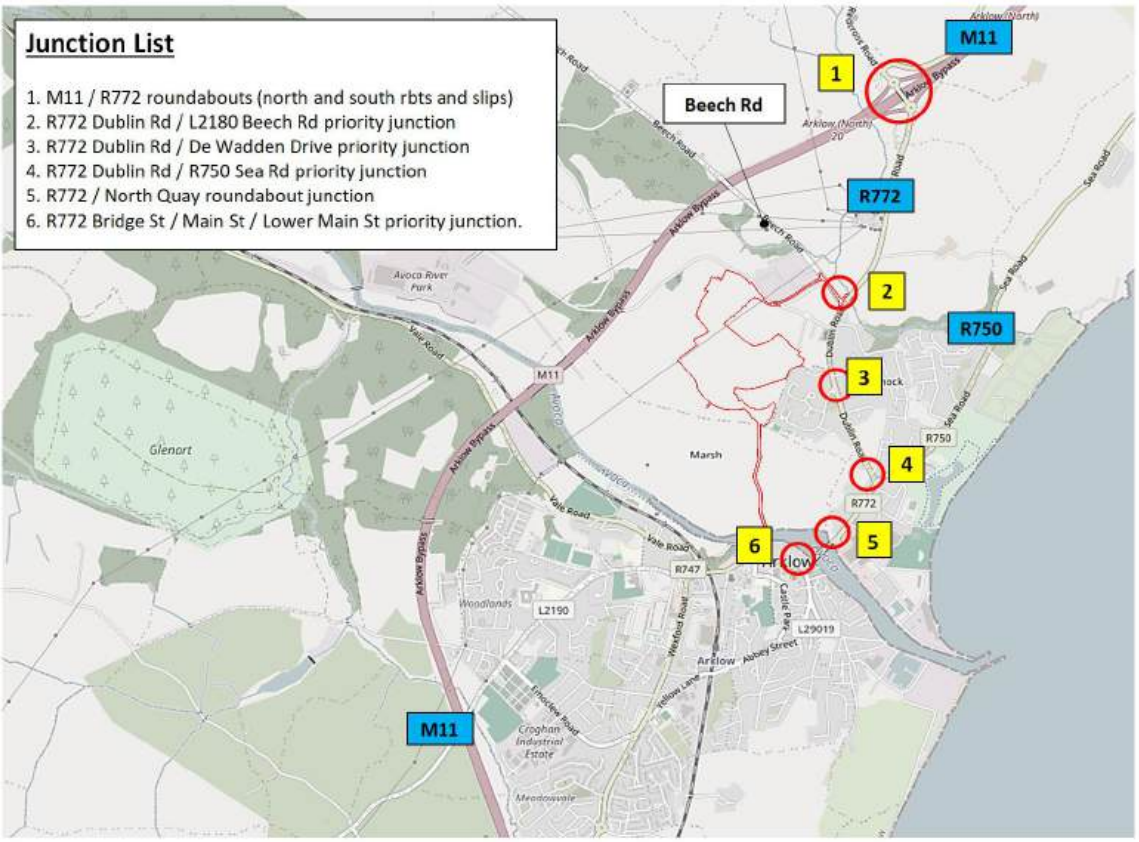


Figure 11. JTC Survey Locations

3.1.2 The identified network peak hours were;

- AM Peak: 08:15 – 09:15.
- PM Peak: 16:45 – 17:45.

3.1.3 Recorded traffic flows for the AM and PM peak hours are shown in **Figure 12** and **Figure 13**. Turn Count diagrams for every surveyed and modelled scenario are provided in **Appendix A**.

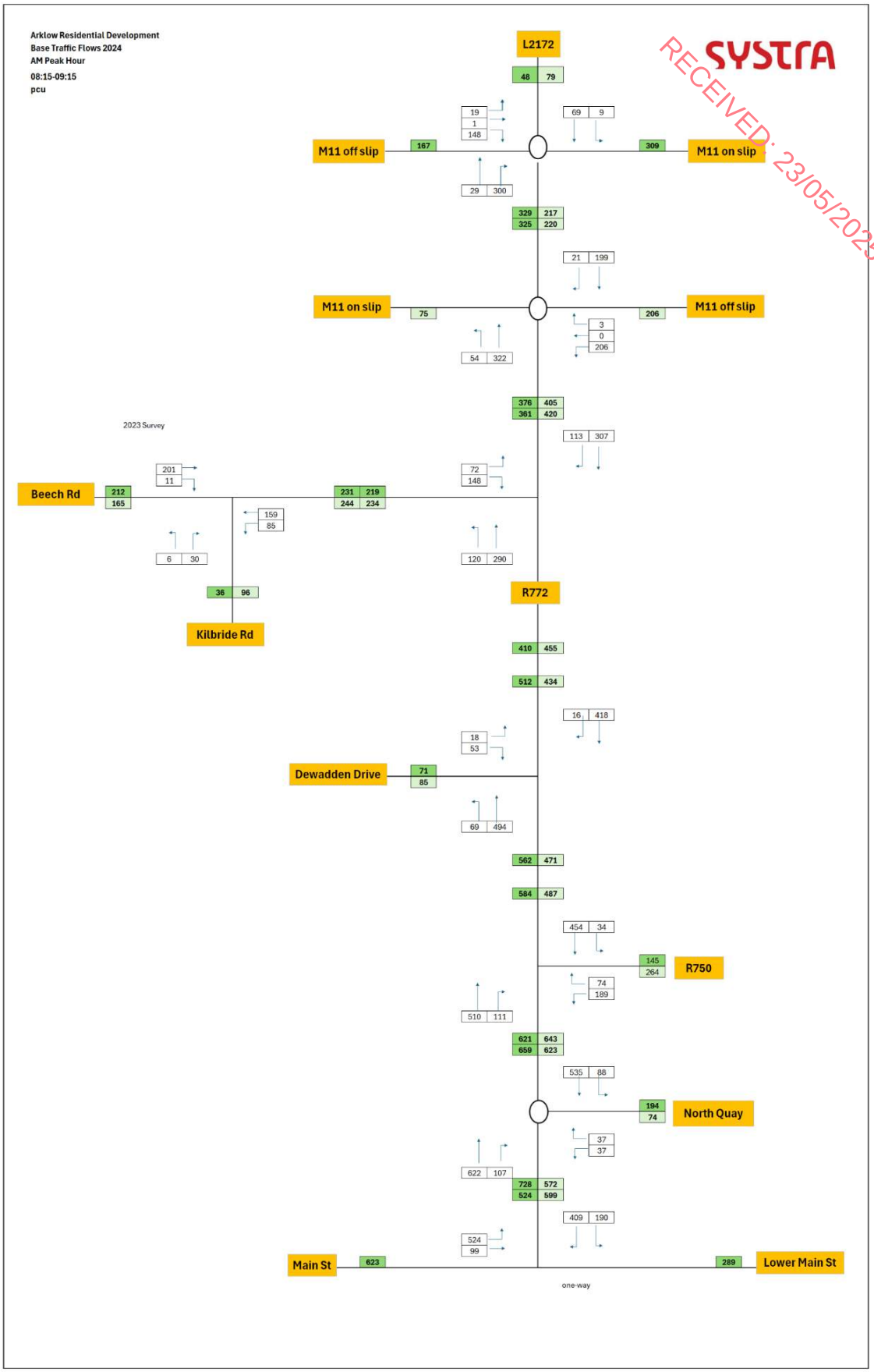


Figure 12. Base 2024 AM Peak Hour traffic flows (08:15 – 09:15, pcu)

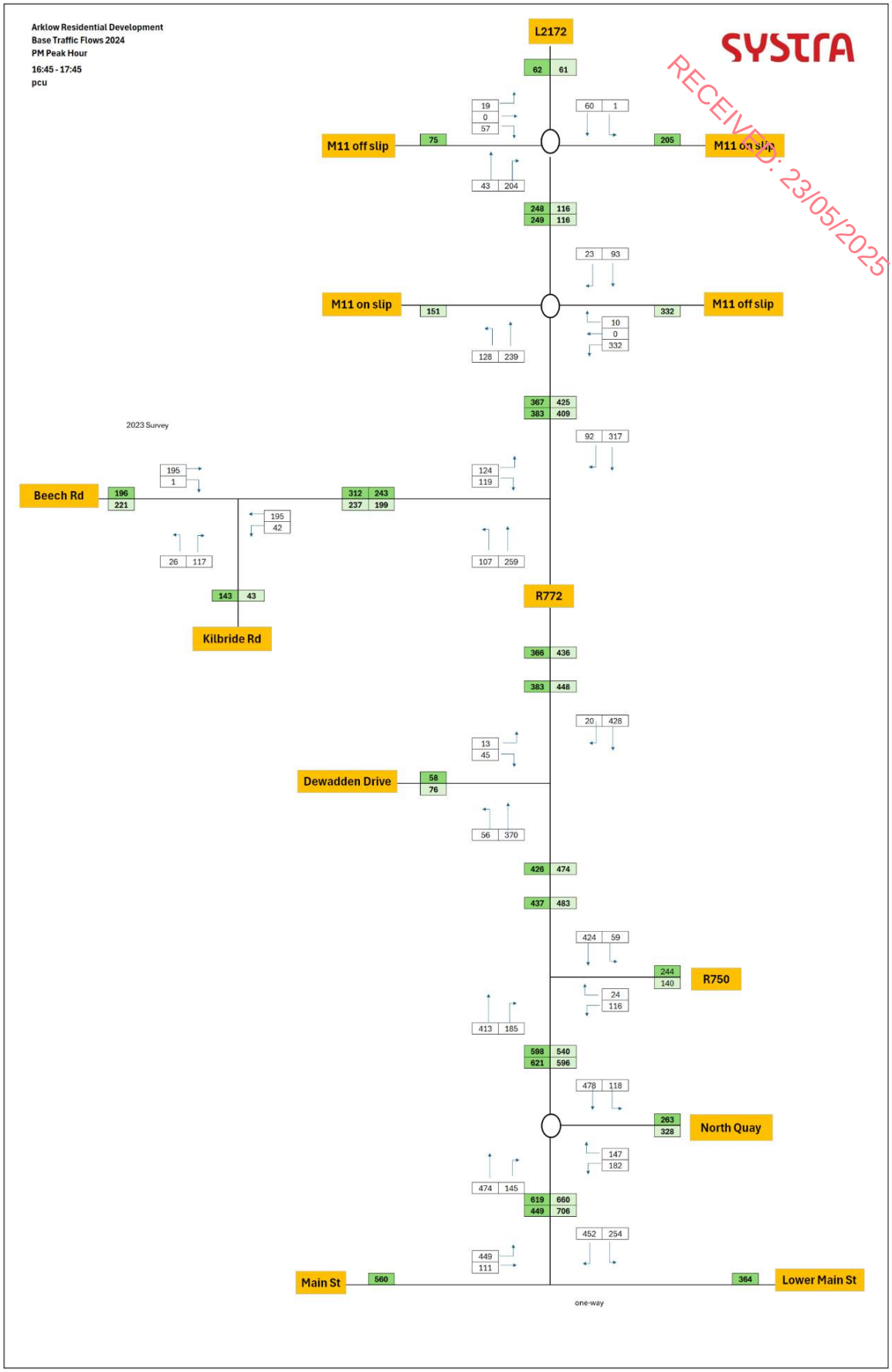


Figure 13. Base 2024 PM Peak Hour traffic flows (16:45 – 17:45, pcu)

Automatic Traffic Counts

3.1.4 An Automatic Traffic Counter (ATC) was placed on R772 Dublin Road, to the south of Beech Road. It recorded hourly traffic flow, composition and speeds for a 7-day period, commencing on 2nd September 2024.

3.1.5 The recorded two-way average weekday flow was 10,846 vehicles per day. **Figure 14** shows the 24-hour weekday flow profiles.

Figure 14. R772 Dublin Road ATC – Average Weekday Flow Profile

3.1.6 **Figure 14** shows that northbound flows peaked around 3pm, at just over 450 vehicles per hour. Southbound flows peaked slightly later, around 5pm at just under 450 vehicles per hour. Overall the observed traffic flows are slightly unusual, in that the flows are not particularly tidal (one-way in the morning, and the other direction in the afternoon). The southbound flow follows a similar patterns to the northbound flow, but is offset by around two hours.

3.1.7 **Table 1** shows the total number of vehicles recorded on each day of the survey.

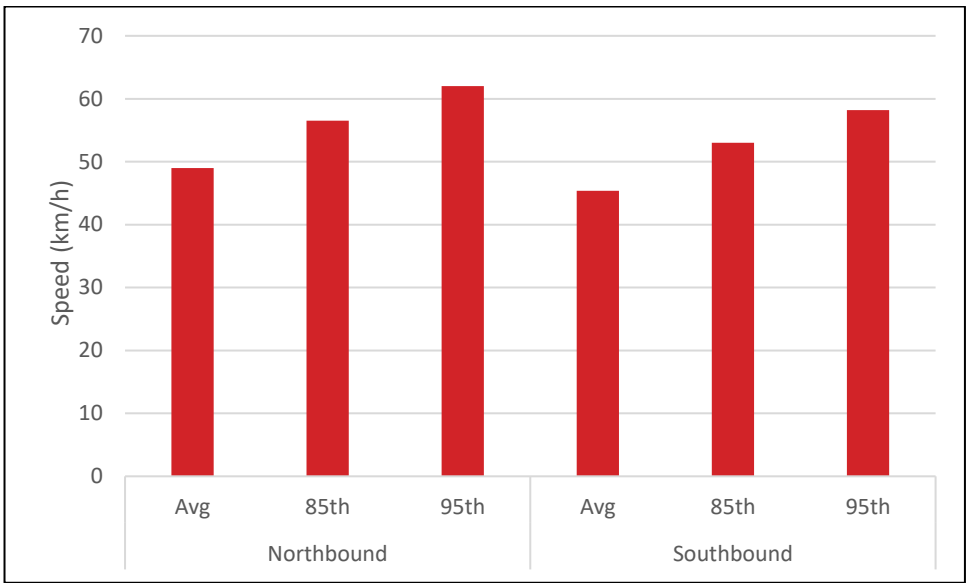
Table 1. R772 Dublin Road ATC – Daily Totals

Day	NB	SB	Total
Mon	5,167	4,883	10,050
Tue	5,515	5,355	10,870
Wed	5,513	5,274	10,787
Thur	5,619	5,293	10,912
Fri	6,066	5,547	11,613
Sat	4,845	4,689	9,534
Sun	4,497	4,386	8,883
5 day ave	5,576	5,270	10,846
7 day ave	5,317	5,061	10,378

3.1.8 The JTC surveys were undertaken on Tuesday 3rd September. **Table 1** shows that recorded flows on this day were typical of those recorded over the course of the week, being slightly higher than Monday and Wednesday, and slightly lower than Thursday and Friday. Traffic flows over the weekend were noticeably lower than during the week.

3.1.9 **Figure 15** indicates the observed speed profile on R772 Dublin Road, which has a posted speed limit of 50km/h at this location.

Figure 15. R772 Dublin Road ATC – Speed Profile



3.1.10 The 85th percentile recorded speeds were:

- Northbound - 56.5km/h.
- Southbound – 53.0km/h.

3.1.11 In total, just under 35% of drivers were observed breaking the posted speed limit of 50km/h.

3.2 Future Network Proposals

3.2.1 As part of the proposals for the consented school campus (Ref: 22/213), a new access road will be constructed, which will run south from Kilbride Road into the proposed development site. Kilbride Road would be realigned, so that the new school access will have priority over Kilbride Road, which will form the minor arm of a priority junction, as shown in **Figure 16.**

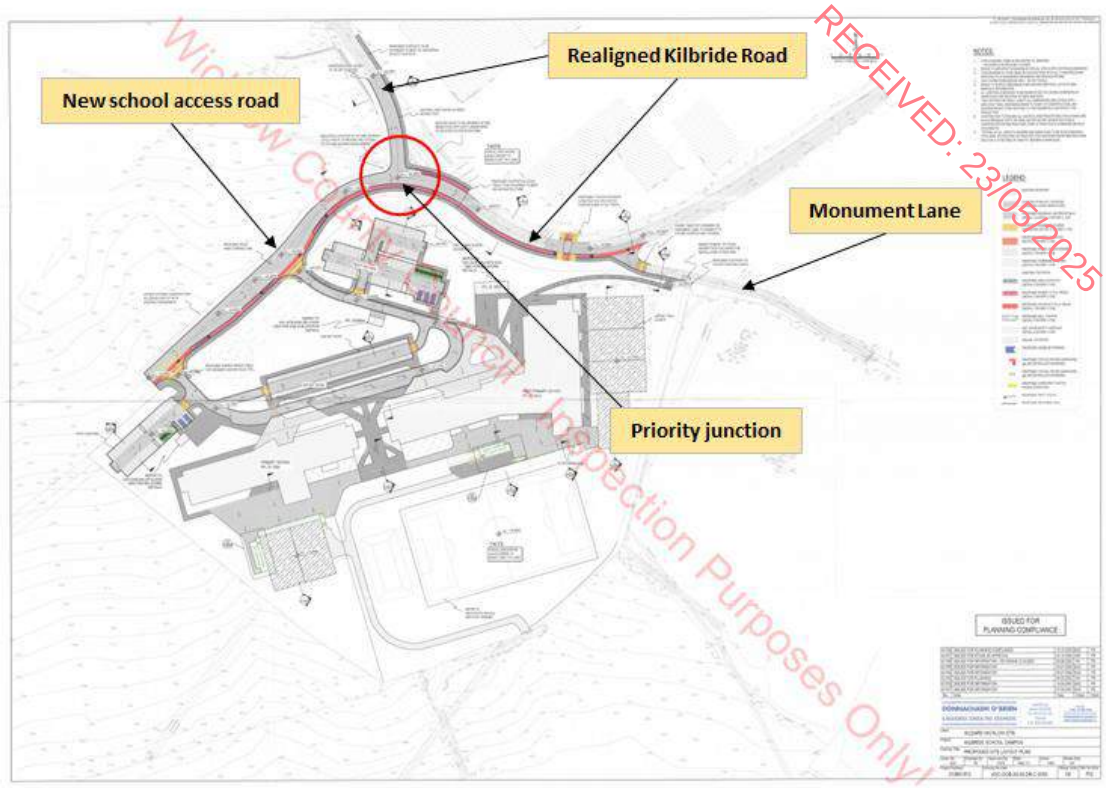


Figure 16. School Access Proposal

This new school access road is intended to form the first part of the future IT5 'Western Distributor Route' alignment, as envisaged in the Arklow LAP.

3.3 Future Transport Initiatives

3.3.1 The Arklow Local Area Plan (LAP) states that *'Traffic flows on a number of the main routes within the town centre are constrained due to the restricted capacity of the junctions.'* Within the town there is currently a single crossing of the Avoca River, via the R672, that links the northern and southern sides of the town. The alternative is to travel between M11 Junctions 20 and 21 which are located to the north and south of Arklow town, but this is a much longer route.

3.3.2 **Objective IT5** of the current LAP identifies a requirement for a 'Western Distributor Route' (WDR) to be constructed through the Kilbride lands, to incorporate a new river crossing and to link Kilbride to the Vale Road, Lamberton Avenue and the Coolgreaney Road. This is intended to alleviate traffic congestion on the existing R672 Nineteen Arches Bridge, which is the single river crossing within Arklow town.

3.3.3 The WDR also allows for a potential future additional interchange on the M11 as identified as **Objective IT6** in the current LAP and as a Strategic Roads Objective in the Wicklow County Development Plan (2022-2028). Both IT5 and IT6 are shown on **Figure 17**.

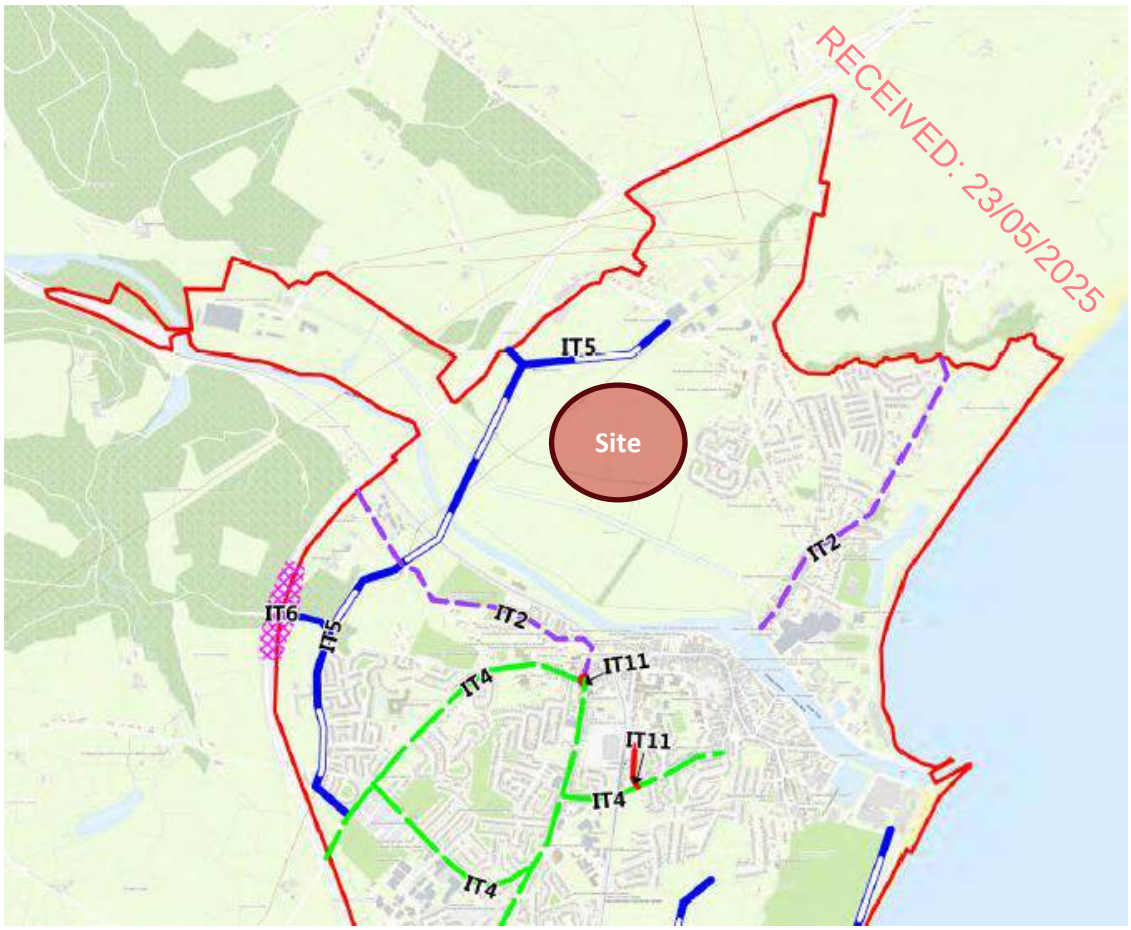


Figure 17. Transport Infrastructure Objectives IT5 & IT6 (Arklow LAP)

3.3.4 The WDR fulfils a wide range of local and strategic requirements

- It forms part of initial access to the Educational Campus and the Kilbride lands, from the L6179 Kilbride Road to the north.
- It will connect to a potential new bridge crossing of the Avoca River when implemented, and onwards to connect to existing roads to the south-west of Arklow Town.
- It will provide additional resilience and capacity on the transport network (for all modes) within Arklow and support opportunities to reallocate road space within the town centre core.
- It will be suitable to accommodate local bus services within Arklow Town, which may be provided in line with future growth of the town.

3.4 Greater Dublin Area Cycle Network Plan (2022)

3.4.1 The NTA's Greater Dublin Area (GDA) Cycle Network Plan (2022) includes proposals for cycle facilities within Arklow town, and specifically in the area of the development site, as shown in **Figure 18**.

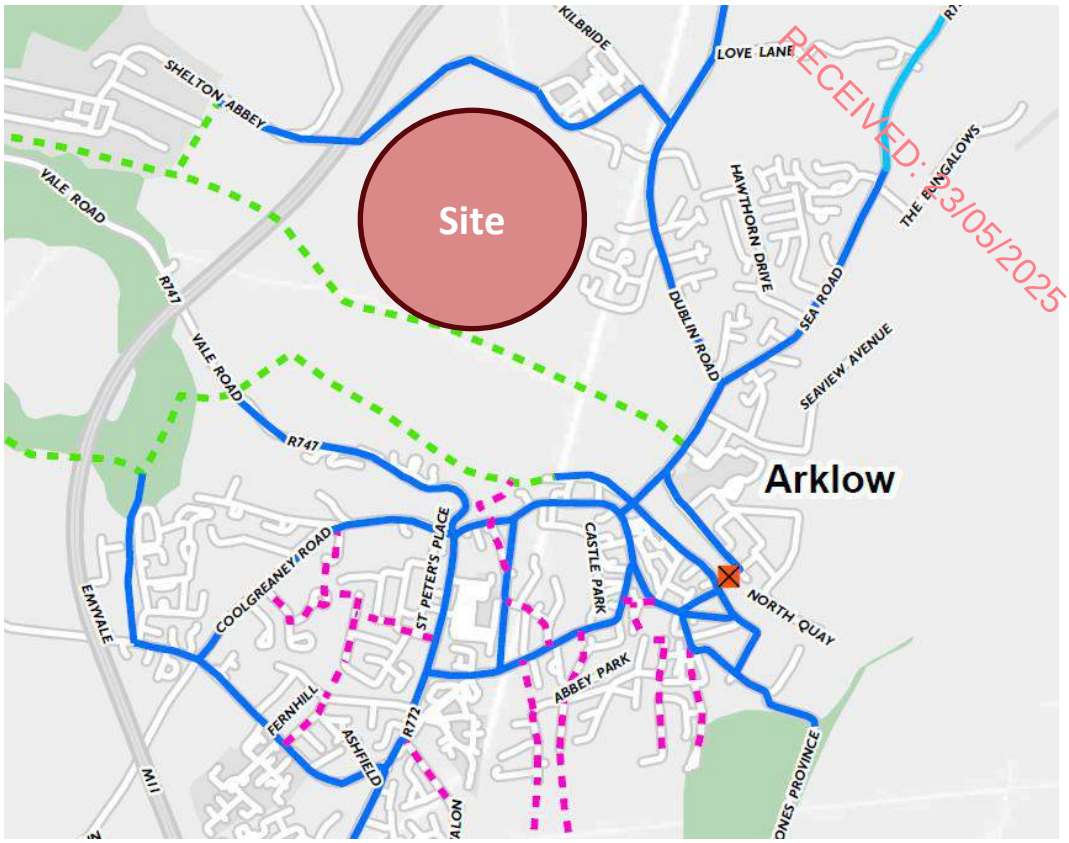


Figure 18. GDA Cycle Network Plan (2022) – Site Context (indicative AAP3 area shown in red)

3.4.2 The GDA cycle network plan envisages Kilbride Road and Beech Road as Secondary cycle routes, along with R772 Dublin Road.

3.4.3 It envisages that the Avoca Marsh Trail, which runs along the site's southern boundary, will become a Greenway that will extend to meet R772 Dublin Road between Seaview Avenue and North Quay.

3.4.4 The boardwalk and bridge connection, which will be provided as part of the development, is not included within GDA Cycle Network, but it will form an important part of the Arklow cycle network, providing a high-quality segregated pedestrian and cycle connection through to the Avoca Marsh trail, and across the Avoca River to connect to Main Street within the town centre.

3.4.5 Similarly, the IT5 Western Distributor Route is not included within the GDA Cycle Network but will also further improve walking and cycling connections in the area.

3.5 Arklow to Shillelagh Greenway route

3.5.1 The Arklow to Shillelagh Greenway is proposed to route along the southern side of the Avoca River, along the waterfront. The emerging preferred route of the Greenway in the context of the site is shown below. This is expected to progress to detailed design in 2024/2025.

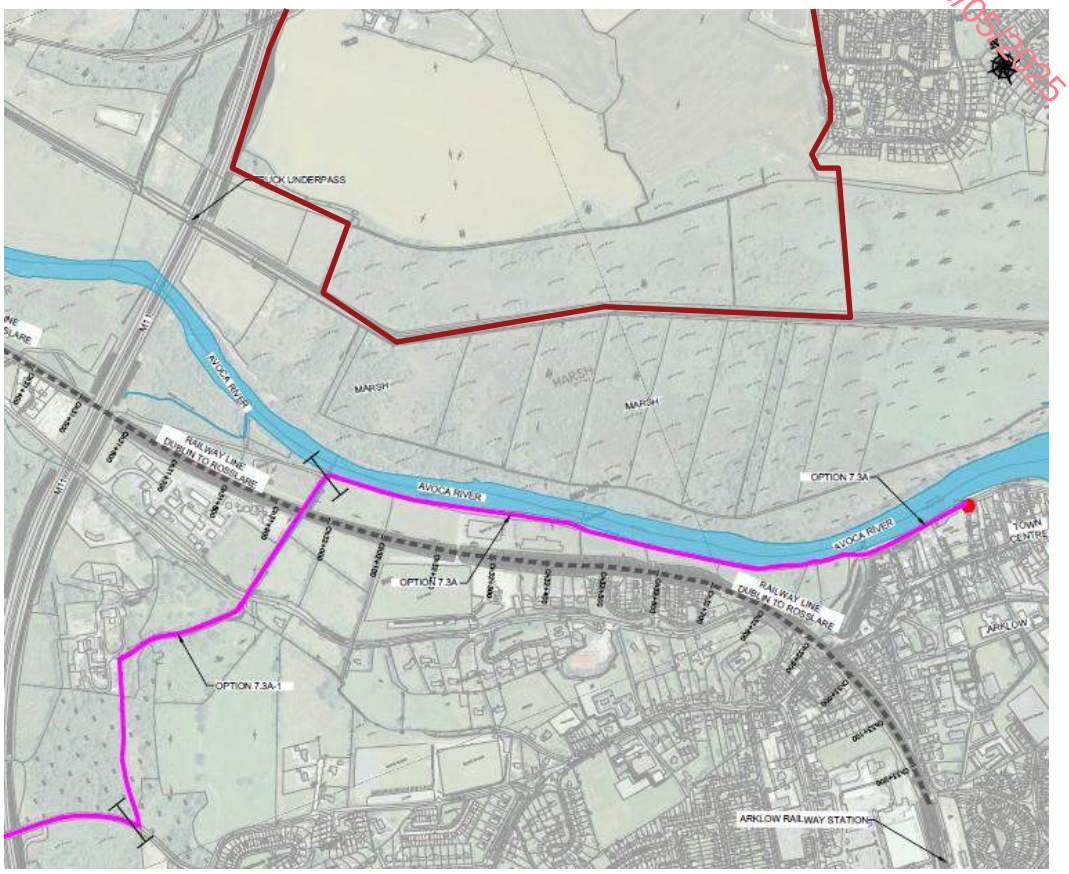


Figure 19. Arklow to Shillelagh Greenway – Emerging Preferred Route (AAP3 boundary shown in red)

4. PROPOSED DEVELOPMENT

4.1 Phase 1 Development

Overview

4.1.1 The Phase 1 developments would provide a total of 666 residential units (this excludes the consented 84no. units covered by application Ref. 23/745, labelled as Phase 1A), comprising a mixture of detached, semi-detached and terraced properties. The proposed layout is shown in **Figure 20.** A full-size Site Plan is provided in **Appendix B.**

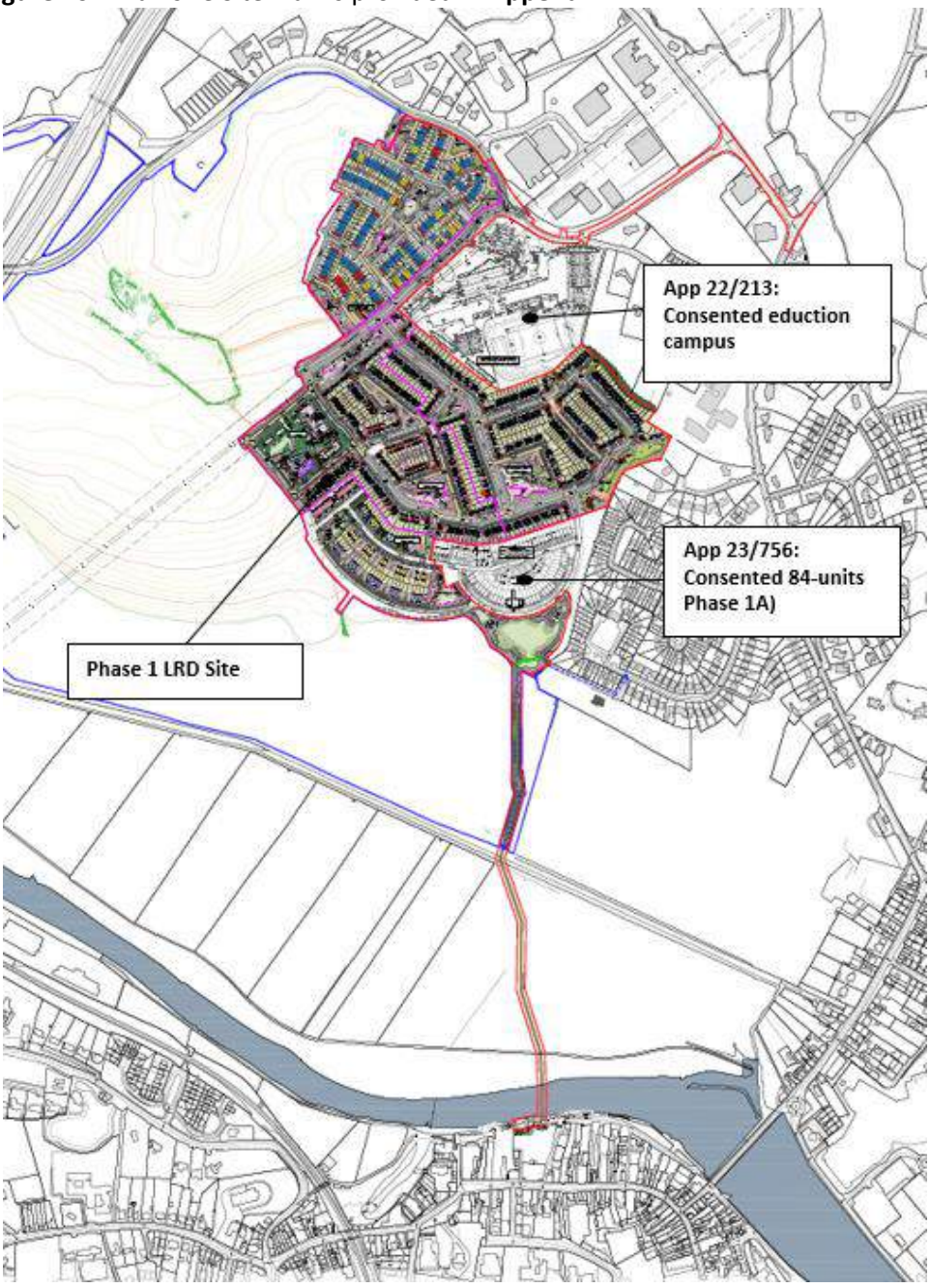


Figure 20. Phase 1 Development - Site Layout

4.1.2 The following breakdown of residential unit types (666 in total) is proposed:

- 100 two-bedroom houses;
- 317 three-bedroom houses;
- 161 four-bedroom houses;
- 24 one-bedroom apartments;
- 51 two-bedroom apartments; and
- 13 three-bedroom apartments;

4.1.3 In addition to the residential properties, the development will contain a Local Centre (located in the west of the site), which will include:

- Six commercial / medical / community use units, with a combined GFA of 1,240m^2; and
- A 1,095m^2 crèche.

4.1.4 The main features of the site design from a transport perspective are:

- Vehicle access will be taken from Kilbride Road, which will be realigned and have the existing priority changed, so that the link into the Kilbride Education Campus and Phase 1 access road becomes the priority route.
- The majority of traffic to and from the site will travel via the R772 Dublin Road / Beech Road priority junction. The priority junction will support the first 113 units on site, but will be upgraded to a signalised junction as part of later phases of development.
- The new link that will run through the site, and the sections of Kilbride Road and Beech Road will be constructed to Regional Road standard and will form the first part of the IT5 Western Distributor Route proposed in the Arklow LAP. Upgrades to the L6179 to provide pedestrian facilities are also included.
- Two new pedestrian/cyclist links connecting into Arklow Town Centre are proposed:
  - Via the Marshland sports club and through into Avondale Crescent; and
  - Via a new boardwalk and pedestrian/cycle bridge across the marsh, and over the Avoca River to meet the south bank, and then continuing south on to Main Street.
- The new Link Road has been designed to accommodate a future bus route, if implemented.
- The site layout will allow for the future extension of the IT5 Link Road, ultimately ensuring that in the longer-term the full implementation of the Western Distributor Road can be facilitated, including a crossing of the Avoca River.
- The internal site layout has been designed in accordance with the Design Manual for Roads and Streets (DMURS), and the Cycle Design Manual (2023).

4.2 Travel by Foot and Cycle

4.2.1 There will be three pedestrian/cycle access points into the development:

- Via the main site access point at the realigned Kilbride Link Road/main access junction;

- Via a new shared facility in the south of the site which will connect into Avondale Crescent; and
- Via a new boardwalk and bridge across the marsh, and over the Avoca River to meet the south bank, and then on to Main Street.

4.2.2 It is envisaged that the majority of walking and cycling trips from the site will be to Arklow town centre to the south. **Figure 21** shows that the proposed Boardwalk will provide an extremely quick and convenient route for residents to access the town centre and railway station, as well as providing a direct route for pupils who live south of the Avoca River to access the Kilbridge Education Campus, without needing to walk along the R772 Dublin Road.

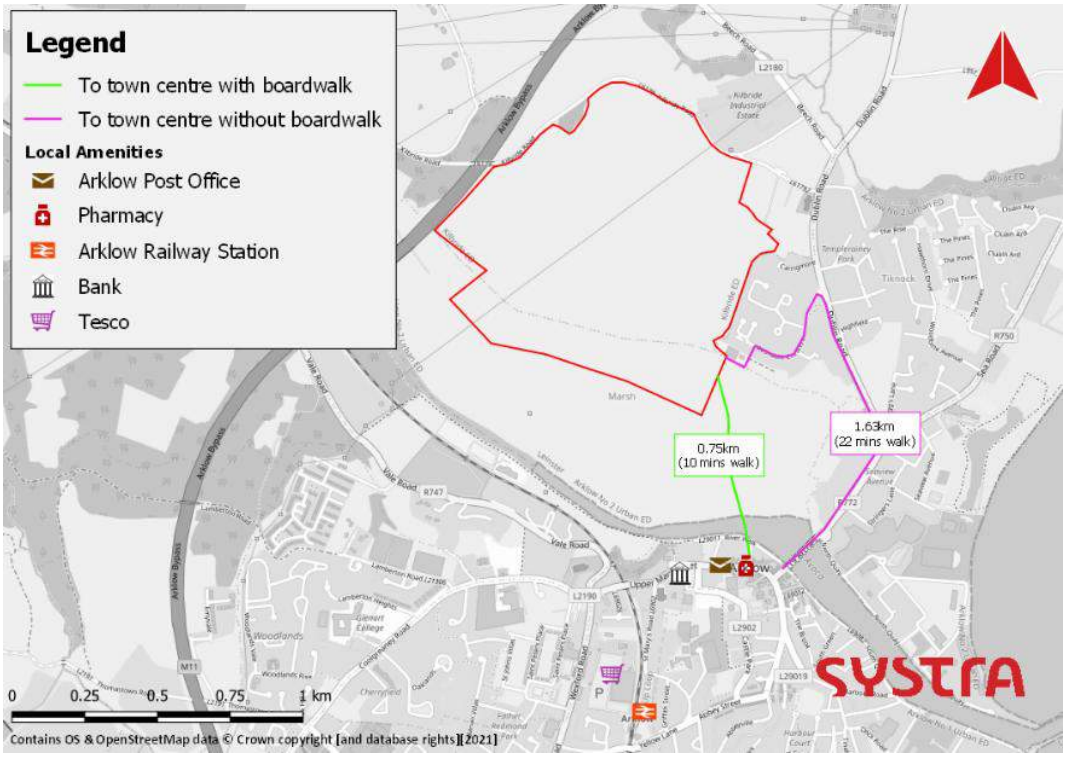


Figure 21. Future walk times between AAP3 lands and town centre

4.2.3 The **internal site design** promotes the travel hierarchy set out in DMURS, where non-motorised modes are prioritised over vehicles.

4.2.4 Segregated, uni-directional cycle tracks will run in both directions for the full length of the Link Road, between Kilbride Road and the western boundary of the site. When the Western Distributor Road progresses, these cycle lanes will be extended along the WDR. These are shown in **Figure 22.**

Figure 22. Segregated cycle lanes on the Link Road

4.2.5 Segregated cycle lanes will also be provided on both sides of the internal access road that runs south-east from the Link Road to meet both the Avondale Crescent and Boardwalk walking / cycling access points. These are shown in **Figure 23.**

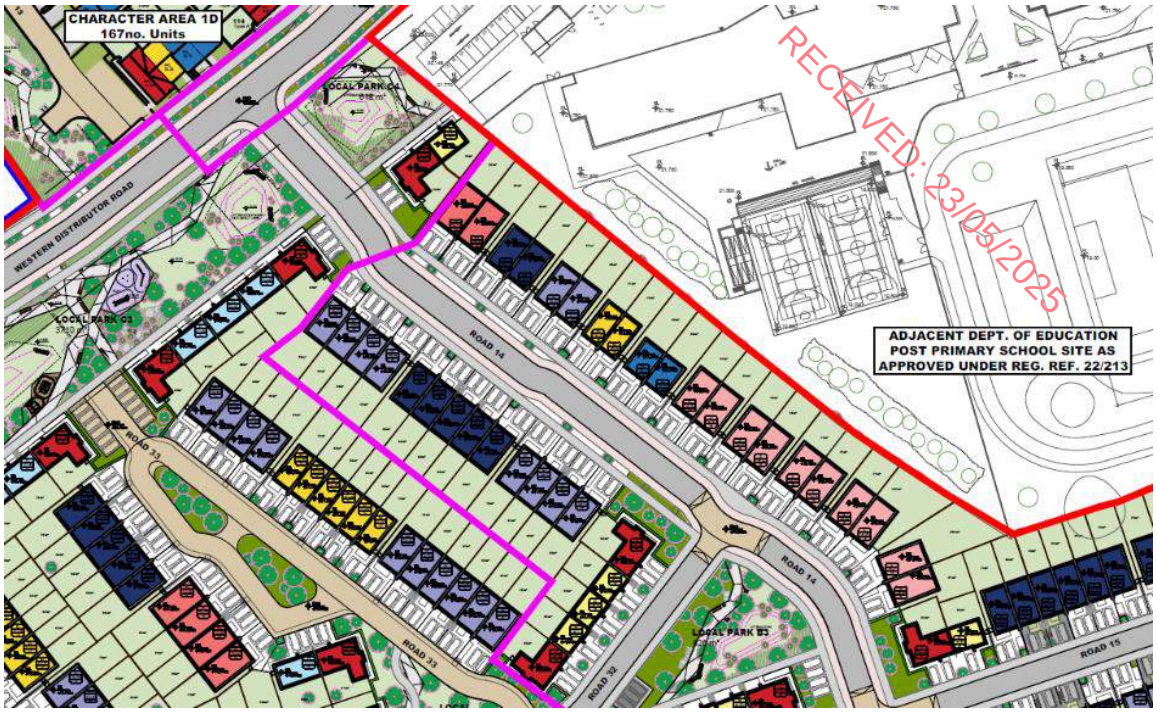


Figure 23. Continuation of cycle lanes south-east from Link Road

4.2.6 A comprehensive network of footways will be provided within the site. Away from the Link Road, raised entry treatments will be provided at all internal junctions, to provide traffic calming and safe places for pedestrians to cross. These are shown in **Figure 24.**

Figure 24. Typical footway network, raised junctions and shared spaces

4.2.7 As also shown in **Figure 24**, these internal quieter streets will function as 'shared spaces' between pedestrians, cyclists and vehicles.

4.2.8 The overall effect of these measures will be to provide a safe and attractive network of pathways that are convenient for pedestrians and cyclists to travel to, from and within the development.

4.1 Cycle Parking

4.1.1 WCC cycle parking standards are set out in **Table 2** below.

Table 2. WCC Cycle Parking Standards

USE CLASS	CYCLE PARKING STANDARD
Residential Units	1 space per bedroom + 1 visitor space per 5 units
Shops	1 space for every 10 car spaces

4.1.2 A total of 266 cycle parking spaces will be provided, in excess of the 244 spaces required by WCC standards. A breakdown of provision is shown in **Table 3**.

Table 3. Cycle Parking Provision

BIKE PARKING SPACES		
Location	**Required**	**Provided**
1A DUPLEX RESIDENTS' SPACES (ENCLOSED TWO-TIER BIKE RACKS) 1 bike per 1 bed unit (12 x 1 = 12no.); 2 bikes per 2 bed unit (12 x 2 = 24no.)	36	36
1A DUPLEX VISITORS SPACES (ENCLOSED TWO-TIER BIKE RACKS) 1no. visitor bike parking space per 2 duplex units (24no./2 = 12)	12	12
1C DUPLEX RESIDENTS' SPACES (ENCLOSED TWO-TIER BIKE RACKS) 2 bikes per 2 bed unit (13 x 2 = 26no.); 3 bikes per 3 bed unit (13 x 3 = 39no.)	65	70
1C DUPLEX VISITORS SPACES (EXTERNAL SHEFFIELD STANDS) 1no. visitor bike parking space per 2 duplex units (26no./2 = 13)	13	14
LOCAL CENTRE RESIDENTS' SPACES (ENCLOSED TWO-TIER RACKS) 1no. bike per bedroom. (1-bed unit x 12 = 12no.) (2-bed unit x 26 =52no.)	64	72
LOCAL CENTRE VISITORS' SPACES (EXTERNAL SHEFFIELD STANDS) - Residential: 1no. space per 5 units (38/5 = 7.6) - Retail: 1no. space per 10 car spaces (63/10 = 6.3) - Créche: 0.5no. per staff member (39/2=19.5) +1no. per 10 children (200/10=20) Total required: 7.6 + 6.3 + 19.5 + 20 = 53.4	54	62
TOTAL NO. OF BIKE SPACES	**244**	**266**
Bike parking includes:	**Provided**	**%**
No. of spaces with electric bike charging facilities	53	20.0%
Bike parking includes:	**Provided**	**%**
Universal access bicycle spaces - Duplex residents	10	9.4%
Universal access bicycle spaces - Local Centre residents	4	5.6%
Universal access bicycle spaces - Local Centre visitors	8	12.9%
Universal Access bicycle parking - TOTAL	**22**	**8.3%**

4.1.3 **Table 3** shows that a mixture of cycle parking will be provided for residents, visitors and staff across the different land-uses within the site. Electric bike charging facilities will be provided at 53 spaces, and 22 cycle parking spaces will be designed as Universal Access spaces.

4.2 Vehicle Access

Access junctions

4.2.1 Vehicle access will be taken from Kilbride Road, which will be realigned and have the existing priority changed, so that the link into the Kilbride Education Campus and Phase 1 site becomes the priority route.

4.2.2 The majority of traffic to and from the site will travel via the R772 Dublin Road / Beech Road priority junction. For the initial phase of the development (113 units), this will be retained as a priority junction. To support further phases of development beyond this, the priority junction will be upgraded to a signalised junction, as shown in **Figure 25**. The full drawing is provided as DWG 2432-DOB-XX-SI-DR-C-0600 that accompanies the application.

Figure 25. Proposed R772 Dublin Road / Beech Road signalised layout

4.2.3 The proposed signalised layout will provide:

- Single lane approaches on both arms of the R772, with space within the junction for 1-2 vehicles turning right into Beech Road to wait without blocking southbound traffic on the R772;
- A single lane plus 25m flare approach on Beech Road; and
- A pedestrian crossing across the Beech Road arm of the junction. It has been assumed that this would be called very infrequently throughout the day, as there is predicted to be little pedestrian demand to cross Beech Road, even with the School and Development in place. Pedestrian access to both the school and residential development will be taken through the south and south-east of the development site.

4.2.4 Junction capacity modelling is presented in **Section 6** of this TTA.

Road Hierarchy

4.2.5 **Figure 24** shows the proposed road hierarchy within the site. This comprises:

- The minimum 6.5m-wide Link Road, which will ultimately become a Regional Road, and bus route, linking R772 Dublin Road with the town centre;
- 6m-wide arterial streets;
- 5.5m-wide Local Streets, with minimum raised 2m footpaths, and on-street parking; and
- Home Zones with Shared Surfaces, to promote more liveable streets.

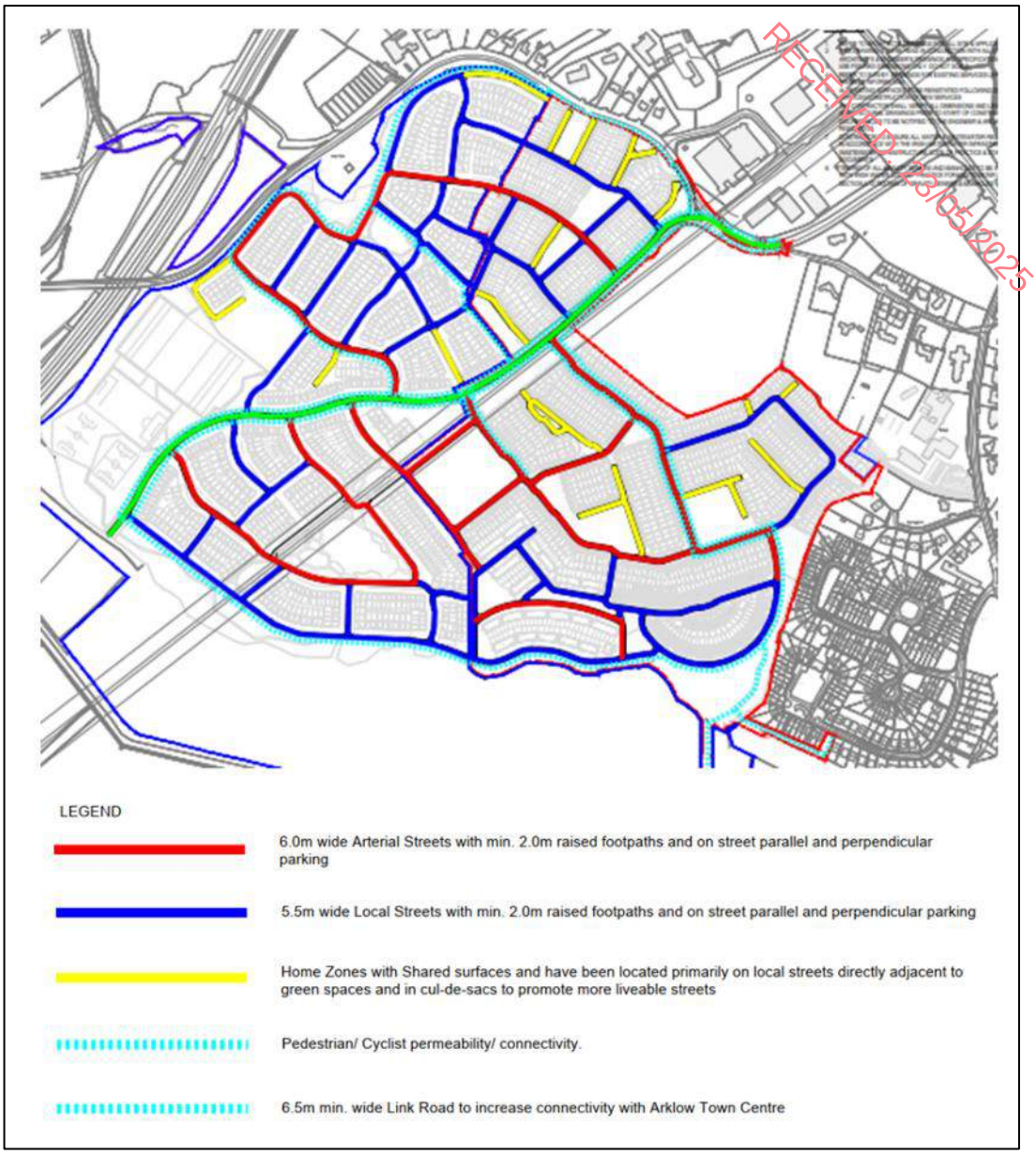


Figure 26. Road Hierarchy (full masterplan lands)

4.3 Car Parking

4.3.1 The development will provide 1,185 parking spaces, of which:

- 948 will be in-curtilage residential spaces;
- 178 will be off-curtilage residential spaces; and
- 59 will be public/shared spaces around the Local Centre.

4.3.2 Residential car parking will be provided at a ratio of:

- 1.8 spaces for the 578 2, 3 and 4-bedroomed houses on sites; and
- 1 space per unit for the 88 apartments / duplexes.

4.3.3 36 spaces (20% of the total of off-curtilage residential spaces) will have EV charging, and 12 spaces (20%) of public parking spaces will have EV charging.

4.3.4 Across the off-curtilage spaces proposed as part of the development, a total of 10 Universal parking spaces will be provided (5.6% of total provision), with a further 3 spaces provided as part of the public/shared parking spaces (5.1% of total provision).

4.4 Local Centre

4.4.1 The Local Centre is shown in **Figure 25**.

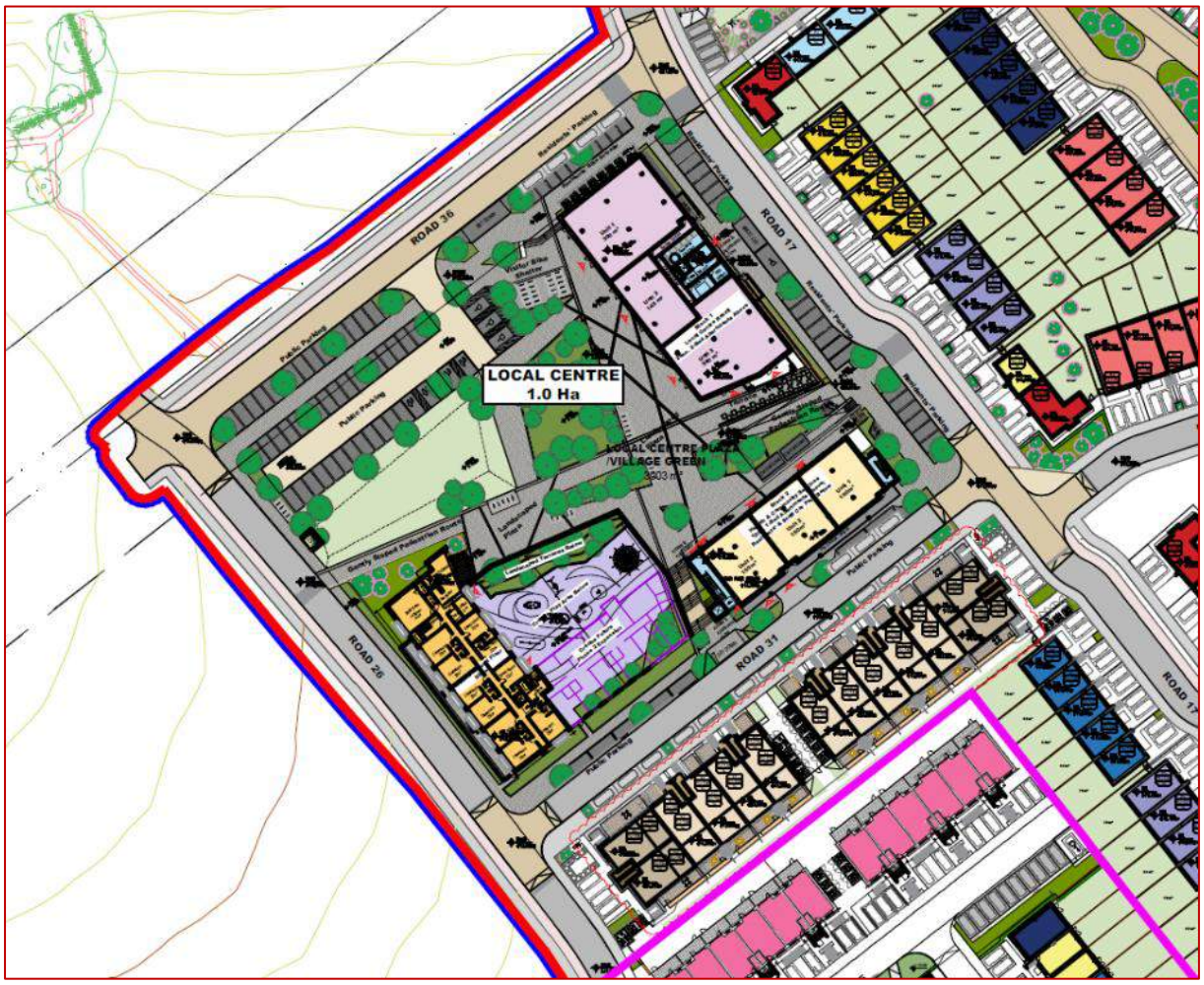


Figure 27. Local Centre

4.4.2 The Centre will be focused around a landscaped central area, which will incorporate two Mobility Hubs. It is envisaged that the Mobility Hubs will provide standard and EV cycle hire, bike washing and maintenance stations and parcel lockers.

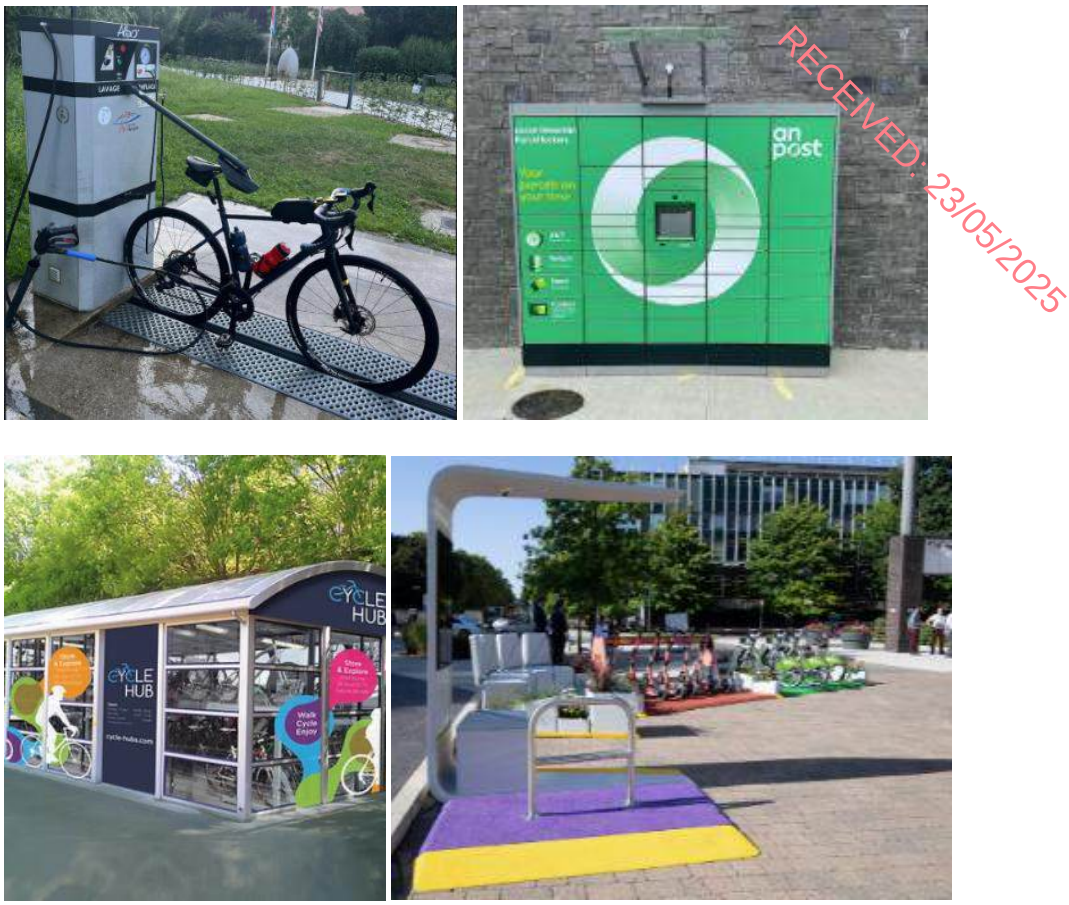


Figure 28. Potential/Indicative Mobility Hub Facilities

4.4.3 Visitor cycle parking will be provided at Sheffield style stands at several locations within the Local Centre:

- Outside the entrance to the crèche;
- To the east of the Health / Community units;
- On the western periphery of the Local Centre;
- Within the central landscaped area; and
- Cycle parking for Centre staff will be provided within an internal cycle store contained within the central Retail Unit.

4.4.4 The overall aim is to make cycling to and from the Local Centre the easiest and most convenient means of travel for residents within the overall site.

4.4.5 Car parking will be provided as follows:

- Within a small car park in the north-west of the Local Centre site;
- Parallel, kerbside spaces will be provided on the road to the north of the Centre, along with a set-down area for the Retail Units; and
- There will be a further 6 parking spaces servicing the crèche, which will be provided along the north kerb of the adjoining road.

4.4.6 The Retail Units will be serviced from their rear (from the road which runs to the east of the Centre).

4.5 Outline Mobility Management Plan

4.5.1 An Outline Mobility Management Plan (OMMP) has been prepared by SYSTRA and is presented later within this report, which sets out how active travel and sustainable travel will be encourage and promoted within the site.

5. TRIP GENERATION & DISTRIBUTION

5.1 Introduction

5.1.1 This section of the Traffic & Transport Assessment sets out the proposed approach towards trip generation and distribution within the assessment.

5.2 Development Phasing

5.2.1 The following indicative phasing is proposed within the overall Phase 1 development:

- **Phase 1A (2027)** – 113 units (including the consented 84 units);
- **Phase 1B (2032)** – an additional 387 units, bringing the total to 500 units. The Local Centre would be constructed in this Phase, along with the Avoca Boardwalk link and town centre bridge; and
- **Phase 1C (2042)** – the remaining 250 units, bringing the total to 750 units.

5.3 Trip Generation

5.3.1 Within the modelling exercise, travel demands have been assumed to come wholly from the residential element of the development.

5.3.2 Although the Local Centre will generate a small amount of external trips, the vast majority of travel demand to / from the centre is expected to come from within the site, and therefore these trips have been assumed to be either pass-by trips (people travelling to or from the centre as part of another journey), or walking and cycling trips retained within the site.

5.3.3 The TRICS database has been used (v7.11.1) to establish trip rates for the site. Person trips rates for the following Land Uses have been extracted, and are presented in **Table 4**:

- 03A: Residential: Houses Privately Owned; and
- 03C: Residential: Flats Privately Owned.

5.3.4 In order to generate as big a sample size as possible, all regions across the UK and Ireland have been considered, with the exception of Greater London. The full TRICS report is provided in **Appendix C.**

Table 4. Person Trip Rates (per unit)

Time	House People Trip Rates			Flats People Trip Rates		
	Inbound	Outbound	Total	Inbound	Outbound	Total
07:00-08:00	0.106	0.482	0.588	0.061	0.315	0.376
08:00-09:00	**0.217**	**0.747**	**0.964**	**0.093**	**0.462**	**0.555**
09:00-10:00	0.196	0.248	0.444	0.166	0.259	0.425
10:00-11:00	0.162	0.201	0.363	0.155	0.203	0.358
11:00-12:00	0.175	0.197	0.372	0.119	0.195	0.314
12:00-13:00	0.210	0.206	0.416	0.177	0.174	0.351
13:00-14:00	0.215	0.189	0.404	0.146	0.172	0.318
14:00-15:00	0.230	0.243	0.473	0.180	0.176	0.356
15:00-16:00	0.498	0.254	0.752	0.259	0.139	0.398
16:00-17:00	0.487	0.246	0.733	0.271	0.131	0.402
17:00-18:00	**0.570**	**0.267**	**0.837**	**0.360**	**0.160**	**0.520**
18:00-19:00	0.463	0.260	0.723	0.292	0.166	0.458
TOTAL	**3.529**	**3.540**	**7.069**	**2.279**	**2.552**	**4.831**

5.3.5 **Table 4** suggests that the peak travel hours for the development will be 08:00-09:00 and 17:00 – 18:00. **Table 5** presents the resultant number of person trips, based upon the full quantum of development of 750 units.

Table 5. Resultant Person Trips

Time	House Person Trip			Flats Person Trip			Total Person Trips		
	Inbound	Outbound	Total	Inbound	Outbound	Total	Inbound	Outbound	Total
07:00-08:00	70	319	389	5	28	33	76	347	422
08:00-09:00	**144**	**495**	**638**	**8**	**41**	**49**	**152**	**535**	**687**
09:00-10:00	130	164	294	15	23	37	144	187	331
10:00-11:00	107	133	240	14	18	32	121	151	272
11:00-12:00	116	130	246	10	17	28	126	148	274
12:00-13:00	139	136	275	16	15	31	155	152	306
13:00-14:00	142	125	267	13	15	28	155	140	295
14:00-15:00	152	161	313	16	15	31	168	176	344
15:00-16:00	330	168	498	23	12	35	352	180	533
16:00-17:00	322	163	485	24	12	35	346	174	521
17:00-18:00	**377**	**177**	**554**	**32**	**14**	**46**	**409**	**191**	**600**
18:00-19:00	307	172	479	26	15	40	332	187	519
TOTAL	**2,336**	**2,343**	**4,680**	**201**	**225**	**425**	**2,537**	**2,568**	**5,105**

5.3.6 **Table 5** shows that the development is expected to generate over 5,100 two-way trips over the course of a typical 12-hour day, with 687 two-way person trips in the AM peak hour, and 600 two-way person trips in the PM peak hour.

5.4 Modal Split

Overview

5.4.1 Within the TA, two different modal splits have been considered. These are set out in the following section.

1. Modal Split based upon Census 2022 data

5.4.2 This approach was used to calculate the baseline modal split from the site, based upon existing car use in areas in the vicinity, existing walking and cycling infrastructure, and public

transport services. **It therefore directly relates to recorded travel patterns from the local area and presents a pessimistic view of future sustainable to and from the site, assuming no modal shift in the future.**

5.4.3 The recorded 2022 modal split for the Census 'Small Area' which the site sits within (Ref. 257079010) is presented in **Table 6**. This is based on a total of 1,564 responses to the Census.

Table 6. Small Area Statistics – Journeys to Work + Education Modal Split

Mode	Mode Split		
	Work	School	Work + School Combined
Walking	10%	29%	18%
Cycling	2%	3%	2%
Car Driver	70%	2%	41%
Car Passenger	7%	58%	28%
Bus, minibus or coach	3%	8%	5%
Other	8%	1%	5%
TOTAL	**100%**	**100%**	**100%**

5.4.4 **Table 7** shows that for work-based trips, 70% of journeys are made as a car driver. This falls to 41% when trips to both work and school are considered.

5.4.5 Current levels of cycling and bus use are very low, even when travel to school is considered.

5.4.6 SYSTRA would note that TRICS trip rates capture **all** journeys to and from developments, which includes both work and school trips, so the 'Work and School' combined trip rate is considered to be the most applicable. However, to provide a robust assessment, the 'Work' mode split has been used in the traffic impact assessment.

5.4.7 **The Census 2022 mode split has been used in the traffic impact assessment for Phase 1,** and reflects the situation prior to the Avoca Boardwalk, crèche or Local Centre being built. A sensitivity test at the R772 / Beech Road junction has also been undertaken which shows the effects if the current mode split (70%) was to be retained in Phases 1B and 1C of the development. This is included in **Appendix E**.

2._ Target Modal Split based upon future transport connections

5.4.8 As set out in **Section 4** as part of the development a Boardwalk and shared pedestrian/cycle bridge connection will be provided between the development and the town centre (assumed to be in Phase 2, 2032), greatly improving active travel connections to the site. The practical effects of this will be to:

- Reduce walking time between the site and town centre to around 10 minutes; and
- Reduce cycling time between the site and town centre to less than 5 minutes.

5.4.9 In addition, the Western Distributor Road (WDR), proposed as part of the Arklow LAP, when constructed, will produce a step-change in connectivity between the site and the town centre, and will enable bus services to route directly through the site.

5.4.10 Both the Boardwalk and WDR initiatives will mean that walking, cycling and public transport between the site and the town centre will be faster, and more attractive than at present.

5.4.11 Based on this, SYSTRA has developed a future 'target' modal split which takes account of this increase in non car-based trips. For a robust approach, the starting point of this has been based on the Census 2022 'Work' mode split. This is set out in **Table 7**.

Table 7. Target Mode Split and trips by mode

Mode	Census JTW mode	Target mode split	AM Peak hour		PM Peak hour	
			Inbound	Outbound	Inbound	Outbound
Walking	10%	15%	23	81	62	29
Cycling	2%	6%	9	32	25	12
Car Driver	70%	55%	84	296	226	106
Car Passenger	7%	12%	18	65	49	23
Bus	3%	10%	15	54	41	19
Other	8%	2%	3	11	8	4
TOTAL	**100%**	**100%**	**153**	**539**	**412**	**192**

5.4.12 SYSTRA would note that in terms of 'Car Driver' (which in effect is the number of vehicle trips generated by the development), the target mode share of 55% sits between the Census 'Work' and 'Work and School Combined' calculated car mode share (41% and 70%, respectively).

5.4.13 SYSTRA would also note that the Government's Climate Action Plan (CAP) 2024 targets a 50% reduction in emissions by 2030. It also aims to:

- Reduce the total distance driven across all journeys by **20%.**
- Ensure that walking, cycling and public transport account for **50%** of all journeys.

5.4.14 Given the ambitious nature of the CAP reductions, the increased target mode shares for walking and cycling (+5% and +4% respectively) proposed as part of the target mode split seem modest and achievable, given the site's location and future infrastructure improvements. Bus travel has been assumed to increase from 3% to 10%.

5.4.15 **The 'target' mode split has been used in the traffic impact assessment for Phases 2 and 3**. This reflects construction of the Boardwalk, and the higher proportion of shorter distance trips (more likely to be undertaken on foot or by bike) as a result of the construction of the school, crèche and neighbourhood Centre.

5.5 Committed Developments

5.5.1 A number of other developments were identified as part of a planning history search that may have the potential to cumulatively interact with the proposed development. The majority of these developments are either outside of the area of influence, or sufficiently low-generating in terms of traffic. The principal developments of note as they pertain to the site are outlined below.

5.5.2 This TA specifically considers the additional traffic that will be generated by:

- The consented 84-unit residential development on the site (Phase 1A); and
- Traffic from the consented School campus.

5.5.3 Traffic from the 84-unit residential development has been included in the 750-unit total assessed above.

5.5.4 The predicted volume of School Campus traffic is as set out in the Transport Assessment submitted to accompany that application.

5.5.5 This states that, when fully occupied, the school campus is expected to generate:

- 214 inbound and 154 outbound vehicle trips in the AM network peak hour (08:15 – 09:15); and
- 18 inbound and 28 outbound vehicle trips in the PM network peak hour (17:15 – 18:15).

5.5.6 The school AM peak hour coincides with peak hour on the wider road network in the AM peak, but in the PM peak, school traffic peaks between 15:00 and 16:00, as pupils depart. This is prior to the overall network peak hour between 16:45 and 17:45.

5.5.7 A proportion of demand generated by the residential development and the school will be 'shared demand', comprising of children who live within the site and who go to the school.

5.5.8 To estimate this, SYSTRA has assumed that:

- The 480-space Primary School, and 400 space Secondary School will open in 2030, prior to the completion and opening of Phases 1B and 1C;
- That an average of 2.89 people will live in each residential unit on site. This has been taken from the CSO Census of Population;
- That 12% of the population of the residential development will comprise Primary age children and 8% by secondary age. This has been based on previous projects that SYSTRA has worked on; and
- That 70% of children who live in the residential development will attend the local school campus.

5.5.9 **Table 8** presents the resultant calculations for Phase 1B and Phase 1C of the development, which will be constructed after the schools are open.

Table 8. School Pupils living with the development

Phase	Units	Population	Cumulative Population	No. in primary	No. in secondary	No at local school	
						Primary	Secondary
2032	500	1445	1445	173	116	121	81
2042	750	2168	2168	260	173	182	121

5.5.10 **Table 8** shows that in Phase 1B of the development (2032), it is predicted that 121 primary-age and 81 secondary-age pupils who live within the development will attend the local school. By Phase 1C (2042), it is predicted that this will grow to 182 primary-age pupils, and 121-secondary age pupils.

5.5.11 SYSTRA has used the vehicle trip rates included within the School Campus TA to calculate how many vehicle trips are assumed to be generated by this number of people (which were included in the overall traffic expected to be generated by the school). These have then been subtracted from the overall number of generated vehicles, to reflect the fact that these pupils will either walk or cycle to school, given that they will live close by.

5.5.12 The calculated reduction in vehicle trips is presented in **Table 9.**

Table 9. Residential / School shared trips

2027 (113 units)				2032 (500 units)				2042 (750 units)			
AM		PM		AM		PM		AM		PM	
Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep
10	7	1	1	45	32	4	6	67	48	6	9

5.5.13 **Table 9** shows that in 2042, 115 vehicle trips (two-way) in the AM peak hour can be removed from the overall total, representing travel demand that is now contained within the site.

5.5.14 The numbers of vehicle trips removed from each turning movement is shown in the traffic flow diagrams in **Appendix A.**

5.6 Trip Distribution

5.6.1 Trips have been distributed throughout the road network based upon the turning proportions recorded during the 2024 survey. This results in the traffic distributions shown in **Table 10**. This distributed traffic is shown in diagram form in **Appendix A.** To ensure a robust assessment, it has been assumed that all vehicular traffic will access/exit the site via the Dublin Road/Beech Road junction to the north-east (with no traffic assumed to use the Beech Road travelling west towards Avoca).

Table 10. Traffic Distribution

Origin / Destination	AM Peak Hour		PM Peak Hour	
	From	To	From	To
L2712 North of M11	4%	2%	3%	3%
M11 east	14%	20%	22%	14%
M11 west	9%	4%	3%	9%
R750 Sea Road	9%	5%	4%	9%
North Quay	4%	10%	16%	13%
Main Street	59%	41%	52%	34%
Lower Main Street		19%		19%
TOTAL	**100%**	**100%**	**100%**	**100%**

5.6.2 Resultant traffic flows for the residential development and School Campus are also presented in **Appendix A.**

6. TRAFFIC IMPACTS

6.1 Introduction

6.1.1 This section of the TA reports on the results of a threshold assessment, and subsequent junction capacity modelling exercise, which has assessed the impact of the development on the local road network. This considers:

- The percentage increase on road links as a result of the development;
- Existing junction performance;
- The number of vehicle trips generated by the development, and where these trips are likely to arrive from / travel to;
- Traffic from committed developments; and
- An allowance for background traffic growth.

6.2 Assessed Time Periods

6.2.1 The following peak hours have been assessed, as identified in the 2024 surveys:

- AM Peak: 08:15 – 09:15; and
- PM Peak: 16:45 – 17:45.

6.3 Traffic Scenarios

6.3.1 Traffic flows have been calculated for the following scenarios:

- Base 2027 (Year of Opening/YoO).
- Base 2027 + Phase 1A Development (113 units).
- Base 2032 + School (YoO + 5).
- Base 2032 + School + Phase 1B Development (500 units).
- Base 2042 + School (YoO + 15).
- Base 2042 + School + Phase 1C Development (750 units).

6.3.2 The following assumptions have been made in Phase 1A:

- The R772 Dublin Road / Beech Road junction remains as a priority junction;
- Pedestrian access towards the town centre will be possible via Avondale Cresent or via Beech Road/Dublin Road, i.e. the proposed Boardwalk is not constructed in this Phase;
- Phase 1a (The consented 84 residential units) forms part of the 113 units; and
- The Education Campus has not been constructed.

6.3.3 The following assumptions have been made in Phase 1B:

- The R772 Dublin Road / Beech Road junction will be converted to a signalised junction;
- The proposed Boardwalk and Bridge across the Avoca have been constructed, forming a more direct pedestrian / cycle route to the town centre;
- The Local Centre has been constructed;

- An additional 387 residential units are constructed, bringing the overall total to 500 units; and
- The Education Campus has been constructed and is in use.

6.3.4 The following assumptions have been made in Phase 1C:

- An additional 250 residential units are constructed, bringing the overall total to 750 units.

6.3.5 Traffic flow diagrams for each scenario are included in **Appendix A**.

Traffic Growth

6.3.6 Base 2024 traffic flows have been factored to future year flows using guidance set out in the 'Project Appraisal Guidelines for National Roads Unit 5.3', specifically Table 6.2 'Link Based Growth Rates' for County Wicklow. The following combined factors have been calculated, based upon Low Growth Rates (Low Growth has been applied in this instance as the proposed development and adjacent school campus site will account for a substantial portion of envisaged growth in the area):

- 2024 – 2027 (Year of Opening) – 1.05.
- 2024 – 2032 (YoO + 5) – 1.10.
- 2024 – 2042 (YoO + 15) – 1.15.

School Traffic

6.3.7 Traffic generated by the school is as set out in the Transport Assessment accompanying the planning application for that site, and as discussed in **Section 6.4**.

Development Traffic

Development traffic has been added to each Base scenario and is as calculated in **Section 5.** Shared trips, representing pupils who live in the development and attend the school(s), have been removed.

6.4 Threshold Assessment

6.4.1 A threshold assessment has been undertaken at the junctions surveyed by SYSTRA, which compares Base traffic flows (plus school traffic beyond 2032) with and without the different phases of the development.

6.4.2 The results of the AM and PM Threshold Assessments are presented in **Table 12** and **Table 13** respectively.

Table 11. AM Threshold Assessment

Junction	Approach Arm	Base 2032 + School	Base 2042 + School	2027 Dev Traffic	2032 Dev Traffic	2042 Dev Traffic	2027 Dev impact %		2032 Dev impact %		2042 Dev impact %	
R772 / M11 EB slips roundabout	M11 EB off	205	212	2	5	8	1%	2%	3%	7%	4%	10%
	L2172	96	100	1	2	4	1%		3%		4%	
	R772	397	412	12	43	64	4%		11%		16%	
R772 / M11 WB slips roundabout	R772 north	272	282	2	8	12	1%	2%	3%	7%	4%	10%
	M11 WB off	258	267	2	8	12	1%		3%		5%	
	R772 south	454	471	14	50	75	4%		11%		16%	
R772 / Beech Rd priority	R772 Dublin Rd north	524	543	5	16	24	1%	7%	3%	17%	4%	24%
	R772 Dublin Rd south	606	624	11	40	60	3%		7%		10%	
	Beech Rd	396	406	57	196	294	25%		50%		73%	
R772 / R750 priority	R772 Dublin Rd north	652	674	42	146	220	8%	4%	22%	10%	33%	15%
	R750 Sea Rd	310	322	1	5	8	1%		2%		2%	
	R772 Dublin Rd south	818	846	10	35	52	2%		4%		6%	
R772 / A750 North Quay roundabout	R772 Ferrybank	794	822	39	136	204	6%	3%	17%	9%	25%	14%
	North Quay	90	93	1	2	3	1%		2%		3%	
	R772 south	930	962	9	33	49	1%		4%		5%	
Main St / R772 priority	Main Street	813	841	9	33	49	1%	3%	4%	10%	6%	16%
	R772	753	780	34	117	176	5%		16%		23%	

Table 12. PM Threshold Assessment

Junction	Approach Arm	Base 2032 + School	Base 2042 + School	2027 Dev Traffic	2032 Dev Traffic	2042 Dev Traffic	2027 Dev impact %		2032 Dev impact %		2042 Dev impact %	
R772 / M11 EB slips roundabout	M11 EB off	85	88	1	5	7	2%	1%	5%	5%	8%	7%
	L2172	68	70	1	5	7	2%		7%		10%	
	R772	279	290	3	12	17	1%		4%		6%	
R772 / M11 WB slips roundabout	R772 north	131	136	3	9	14	2%	2%	7%	7%	10%	10%
	M11 WB off	369	384	10	33	50	3%		9%		13%	
	R772 south	412	429	5	18	27	1%		4%		6%	
R772 / Beech Rd priority	R772 Dublin Rd north	456	474	12	43	64	3%	6%	9%	19%	13%	27%
	R772 Dublin Rd south	417	433	31	107	161	8%		26%		37%	
	Beech Rd	296	307	20	70	105	8%		24%		34%	
R772 / R750 priority	R772 Dublin Rd north	554	576	15	52	78	3%	4%	9%	12%	14%	17%
	R750 Sea Rd	156	162	2	6	9	1%		4%		5%	
	R772 Dublin Rd south	671	698	29	101	152	5%		15%		22%	
R772 / A750 North Quay roundabout	R772 Ferrybank	677	703	13	46	69	2%	3%	7%	8%	10%	12%
	North Quay	363	377	7	24	36	2%		7%		10%	
	R772 south	694	722	22	78	116	3%		11%		16%	
Main St / R772 priority	Main Street	628	653	22	78	116	4%	2%	12%	8%	18%	12%
	R772	796	827	11	37	55	1%		5%		7%	

6.5 Modelled Junctions

6.5.1 Based upon the 10% threshold at which junction capacity testing is typically required, capacity testing has been undertaken at the following junctions:

- R772 / Beech Road priority junction;
- R772 / R750 Sea Road priority junction;
- R772 / North Quay roundabout; and
- R772 / Main Street / Lower Main Street priority junction.

6.6 Junction Assessment Software

Junctions 11 Modelling

6.6.1 Junctions 11, an industry-standard software package, has been used to test priority junctions and roundabouts.

6.6.2 The modelling reports on the Ratio of Flow Capacity (RFC) and the maximum forecast queue for each give-way movement within the junctions, specifically:

- Minor arm right-left turning movements;
- Major arm right-turning movements into the minor arm; and
- Roundabout approaches.

6.6.3 The RFC of an arm of a junction is one of the principal factors in influencing queues and delays. General engineering design principles, as set out in the DMRB, suggest that when assessing a priority junction or roundabout, RFC levels on a given arm of a junction should not exceed 0.85 in order for that arm to operate within its 'practical' capacity. Should the RFC level exceed 1.0 then the junction is considered to be operating above its 'theoretical' capacity.

6.6.4 When the performance of an arm exceeds 1.0 RFC, the subsequent queue and delay information increases exponentially. In these instances, queue and delay values should not be compared between scenarios, it is enough to identify that the junction is operating significantly over capacity.

LinSig Modelling

6.6.5 LinSig has been used to model signalised junctions.

6.6.6 Geometric parameters have been taken from OS data and proposed layout drawings, and suitable signal phasing and staging has been developed by SYSTRA. Minimum greens and intergreens have been calculated using appropriate standards.

6.6.7 A minimum green time of 7s has been assumed for standard signalised traffic phases, with a minimum green time of 5s for traffic filters and indicative arrows. The minimum green time for pedestrian crossings has been set at 6s. A cycle time of 120s has been assumed for a single cycle junction staging.

6.6.8 The signalised junctions modelled are likely to be MOVA controlled (or similar), which means that phase and cycle times can vary per cycle and are automatically optimised according to

traffic flow and pedestrian demands. To model this effect, cycle times were fixed within LinSig, and signal timings optimised for each scenario.

6.6.9 LinSig results refer to the Degree of Saturation (DoS) and Mean Maximum Queue (MMQ) predicted for each lane at the junction. A DoS of 100% indicates that the lane in question is operating at its theoretical capacity (point of saturation), whilst a DoS of 90% or less indicates that the lane is operating within its practical capacity.

6.6.10 The MMQ represents the maximum queue (in PCUs) within a typical cycle averaged over all the cycles within the modelled time period.

6.6.11 Full model inputs and outputs for both LinSig and Junctions 11 modelling can be provided electronically upon request.

6.7 Construction Phase

6.7.1 Subject to planning, construction is expected to commence prior to the end of 2025 and continue during the phased implementation of the overall development.

6.7.2 The level of construction traffic has been calculated based on the following assumptions:

- During the period of peak construction there will be a maximum of 150 workers on site daily;
- Assuming a robust vehicle occupancy of 1.5 persons per vehicle, this results in 100 inbound vehicle trips and 100 outbound vehicle trips over the course of the day. It is assumed that these will be car / van trips;
- All workers will arrive on site before 07:30, therefore all arrivals are assumed to be between 07:00 and 08:00;
- Departing vehicles are assumed to be distributed across the afternoon and evening as follows:
  - 50% departing before 16:00;
  - 30% departing between 16:00 and 17:00; and
  - 20% departing between 17:00 and 18:00.
- For robustness, it has also been assumed that there will be a nominal inbound and outbound flow of car / van traffic throughout the day associated with unscheduled site visits or small deliveries, etc.;
- General construction traffic is assumed to travel to and from the site in line with prevailing traffic flow distributions on the wider road network, with HGV and delivery vehicles assumed to access the site via the M11 to the north and the R772 Dublin Road only; and
- There will be an average of 3 HGV arrivals and 3 departures per hour between 07:00 and 16:00.

6.7.3 **Table 13** presents the calculated number of construction trips throughout the day.

Table 13. Estimated Construction Traffic

Hour Starting	Cars / vans		HGV		Total	
	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound
07:00	100	10	3	3	**103**	**13**
08:00	10	10	3	3	**13**	**13**
09:00	10	10	3	3	**13**	**13**
10:00	5	10	3	3	**8**	**13**
11:00	5	10	3	3	**8**	**13**
12:00	5	10	3	3	**8**	**13**
13:00	5	10	3	3	**8**	**13**
14:00	10	10	3	3	**13**	**13**
15:00	10	10	3	3	**13**	**13**
16:00	10	50	3	3	**13**	**53**
17:00	10	30	0	0	**10**	**30**
18:00	10	20	0	0	**10**	**20**
TOTAL	**190**	**190**	**30**	**30**	**220**	**220**

6.7.4 **Table 13** shows that there are expected to be a total of around 440 two-way vehicle trips to and from the site across a typical day during the construction period.

6.7.5 The traffic impact at the R772 Dublin Road / Beech Road priority junction has been assessed for the **peak construction hours,** namely 07:00 – 08:00 and 16:00 – 17:00. The results of this assessment are presented in **Table 14**.

Table 14. Dublin Road / Beech Road Peak Construction Trips Junctions 11 Results

Arm	Pre AM peak hour (0700-0800)			Pre PM peak hour (1600-1700)		
	Queue (pcu)	Delay (s)	RFC	Queue (pcu)	Delay (s)	RFC
Base 2027 + Peak Construction Traffic						
Beech Road LT	0.2	8.0	0.13	0.6	12.3	0.35
Beech Road RT	0.2	12.6	0.17	1.0	19.8	0.49
Dublin Road	0.7	10.2	0.33	0.4	6.7	0.20

6.7.6 **Table 14** indicates that during the AM and PM peak hours of construction trips the junction will operate well within capacity. Scheduling of construction working hours to avoid the morning network peak is seen to minimise the potential impact of construction traffic.

6.8 Development Phases 1A, 1B and 1C

6.8.1 This section of the report presents the results of the junction capacity assessments. Results are presented for each modelled scenario.

6.8.2 The impact of construction traffic has also been considered in this assessment, as construction will be ongoing on subsequent phases of the development as each phase is completed. The estimated levels of construction traffic shown in **Table 13** for the AM and PM **network peak** hours (08:00 – 09:00 and 17:00 – 18:00) has been added to the overall traffic flows used in the junction models, as construction will remain ongoing in the Opening Year and Opening Year +5 scenarios as the site continues to develop.

R772 Dublin Road / Beech Road priority junction

6.8.3 The R772 Dublin Road / Beech Road junction is currently a priority-controlled junction. It is anticipated that the junction would remain priority controlled until at least 2027, which includes the opening of Phase 1A of the development.

6.8.4 **Table 15** presents the modelling results for this junction.

Table 15. R772 Dublin Road / Beech Road Junctions 11 Results

Arm	AM peak hour (0815-0915)			PM peak hour (1645-1745)		
	Queue (pcu)	Delay (s)	RFC	Queue (pcu)	Delay (s)	RFC
Base 2024						
Beech Road LT	0.2	10.0	0.17	0.3	9.2	0.25
Beech Road RT	0.8	17.4	0.43	0.6	15.8	0.36
Dublin Road	0.7	7.4	0.29	0.5	6.7	0.24
Base 2027						
Beech Road LT	0.3	10.6	0.20	0.5	11.4	0.32
Beech Road RT	0.9	19.4	0.47	0.9	19.6	0.45
Dublin Road	0.9	7.8	0.34	0.7	7.2	0.30
Base 2027 + Dev (113 units)						
Beech Road LT	0.4	13.0	0.27	0.5	11.7	0.35
Beech Road RT	1.5	25.7	0.60	1.1	22.0	0.51
Dublin Road	0.9	8.0	0.35	0.9	7.7	0.34

6.8.5 **Table 15** indicates that with traffic growth and Phase 1A of the development in place the priority junction arrangement will continue to operate within capacity.

R772 Dublin Road / Beech Road signalised junction

6.8.6 The existing priority junction will need to be upgraded to signal control to accommodate future traffic growth, the school and the Phase 1B development at the site. The upgrade is anticipated to occur between 2027 and 2032. The upgraded junction would provide:

- Single lane approaches on both arms of the R772. There would be space within the junction for 1-2 vehicles turning right into Beech Road to wait without blocking southbound traffic on the R772.
- A two-lane approach on Beech Road. The outside lane would be a short flare to accommodate approximately 6 right-turning vehicles.
- A signalised pedestrian crossing across the Beech Road arm of the junction. For the purpose of this assessment, it has been assumed that this would be called very infrequently throughout the day, as there is predicted to be little pedestrian demand to cross Beech Road, and pedestrian access to both the school and residential development will be taken through the south and south-east of the development site due to the connectivity provided through to Arklow Town Centre.

6.8.7 **Table 16** presents the modelled results for the signalised R772 / Beech Road junction. The model assumes a 120s cycle time, and that the pedestrian stage will be called infrequently.

Table 16. R772 Dublin Road / Beech Road LINSIG results

Arm	AM peak hour (0800-0900)			PM peak hour (1700-1800)		
	Queue (pcu)	Delay (s)	RFC	Queue (pcu)	Delay (s)	RFC
Base 2032 + School						
R772 Dublin Rd (S)	12.5	17.8	52.50%	7.7	16.3	36.80%
Beech Road	9.7	40.7	62.1 : 62.1%	4.6	34.5	44.9 : 44.9%
R772 Dublin Rd (N)	14.0	27.9	60.80%	9.9	19.3	45.20%
Base 2032 + School + Dev (500 units)						
R772 Dublin Rd (S)	14.5	23.3	59.10%	10.4	17.8	46.50%
Beech Road	15.5	40.6	75.2 : 75.2%	6.8	36.2	54.8 : 54.8%
R772 Dublin Rd (N)	17.3	41.9	76.50%	12.8	24.8	55.90%
Base 2042 + School						
R772 Dublin Rd (S)	13.1	18.1	54.20%	7.8	15.3	37.30%
Beech Road	9.8	40.9	62.5 : 62.5%	4.3	35.7	42.6 : 42.6%
R772 Dublin Rd (N)	14.5	28.4	62.20%	9.3	17.4	42.70%
Base 2042 + School + Dev (750 units)						
R772 Dublin Rd (S)	16.0	25.7	63.20%	12.0	17.6	51.30%
Beech Road	19.6	44.6	83.0 : 83.0%	7.5	38.7	58.2 : 58.2%
R772 Dublin Rd (N)	19.5	51.6	84.60%	13.5	25.3	58.00%

6.8.8 **Table 16** shows that the junction is expected to operate within capacity in all of the assessed scenarios. The AM peak hour is the busiest period, as this is the time when school traffic is arriving and departing, and also when trips out of the development are highest.

6.8.9 The analysis shows that the junction is expected to be approaching capacity in 2042, when 750 units are built on site and the school is constructed and operational. In particular in the AM peak hour, the Dublin Road southbound approach to the junction is expected to have an RFC of 84.6%.

6.8.10 A sensitivity test has been undertaken for the junction in the 2032 and 2042 scenarios, with the mode share for cars retained at the current value of 70% (as opposed to the 55% adopted in this assessment). The results are presented in **Appendix E**.

6.8.11 The proposed junction upgrade to signal-control will result in a greater degree of priority offered to the Beech Road approach arm when implemented. It is noted that in the AM peak period in particular, the signalisation allows for better optimisation of green time to accommodate the increased flows on the Beech Road. Both the Beech Road and Dublin Road southbound approaches to the junction are seen to remain within their theoretical capacities due to the proposed signal control and intelligent operation.

6.8.12 The proposed signal-controlled layout represents an interim upgrade to the junction which is sufficient to accommodate the proposed development. In the longer-term, in the event of further development within the AAP3 lands and/or the implementation of the Western Distributor Road, the additional traffic flows and potentially displaced traffic from Arklow Town Centre will ultimately require additional upgrades to be implemented at this junction.

6.8.13 The proposed layout also includes for a limited amount of space to accommodate right-turning vehicles from the Dublin Road to the Beech Road, for 1-2 waiting vehicles. It is not envisaged that the number of right-turning vehicles associated with the proposed development at this junction will be significant in the AM peak period – the proposed school development is the main generator of additional right-turning traffic at this junction in this period.

R772 / R750 Sea Road priority junction

6.8.14 The R772 / R750 junction is a simple priority junction, where the R772 forms the major arms, and the R750 Sea Road, which forms the eastern arm, must give way. Sea Road has a single-lane approach, and traffic on the R772 south waiting to turn right into Sea Road can block northbound traffic following behind.

6.8.15 **Table 17** presents the modelled results for the junction.

Table 17. R772 / R750 Junctions 11 Results

Arm	AM peak hour (0815-0915)			PM peak hour (1645-1745)		
	Queue (pcu)	Delay (s)	RFC	Queue (pcu)	Delay (s)	RFC
Base 2024						
Sea Road LT	0.7	11.5	0.40	0.3	8.1	0.22
Sea Road RT	0.4	16.5	0.27	0.1	13.3	0.09
R772	1.2	6.7	0.37	2.2	10.6	0.57
Base 2027						
Sea Road LT	0.7	12.4	0.43	0.3	8.5	0.24
Sea Road RT	0.4	18.0	0.30	0.1	14.2	0.10
R772	1.3	6.9	0.40	2.7	12.0	0.62
Base 2027 + Dev (113 units)						
Sea Road LT	0.8	13.0	0.44	0.3	8.6	0.24
Sea Road RT	0.5	19.3	0.32	0.1	14.7	0.11
R772	1.4	7.0	0.41	3.0	12.4	0.64
Base 2032 + School						
Sea Road LT	1.2	19.4	0.55	0.3	9.0	0.26
Sea Road RT	1.0	33.9	0.51	0.1	15.6	0.12
R772	2.6	7.9	0.53	3.7	14.4	0.69
Base 2032 + School + Dev (500 units)						
Sea Road LT	1.7	27.9	0.64	0.4	9.4	0.27
Sea Road RT	1.5	51.5	0.62	0.2	18.0	0.16
R772	3.1	8.8	0.57	5.9	18.7	0.77
Base 2042 + School						
Sea Road LT	1.5	23.6	0.61	0.4	9.3	0.27
Sea Road RT	1.3	42.2	0.58	0.1	16.5	0.13
R772	3.1	8.6	0.57	4.7	17.1	0.74
Base 2042 + School + Dev (750 units)						
Sea Road LT	4.3	69.1	0.85	0.4	9.9	0.29
Sea Road RT	3.4	114.8	0.83	0.2	20.5	0.19
R772	4.2	10.5	0.64	11.4	34.0	0.88

6.8.16 **Table 17** shows that the junction is currently operating within capacity, and this is forecast to be the case when Phases 1A and 1B of the development are added in 2027 and 2032, respectively.

6.8.17 In the Base 2042 + School + Phase 1C development scenario (AM and PM peak hours) the R750 Sea Road arm is predicted to operate marginally over practical capacity. This is deemed by SYSTRA to be an acceptable level of performance, given that this is some distance in the future, and would be limited to peak hours only. This is also based on the existing junction configuration.

6.8.18 SYSTRA would also note that the introduction of the Western Distributor Road is likely to reduce traffic flows on the R772 as it passes Sea Road meaning that the future mitigation measures may not be required.

R772 / North Quay Roundabout

6.8.19 The R772 / North Quay roundabout is a three-arm roundabout. The R772 approaches are both single-lane, and the North Quay approach is a single lane plus short 15m flare.

6.8.20 **Table 18** presents the modelled results for the junction.

Table 18. R772 / North Quay Junctions 11 Results

Arm	AM peak hour (0800-0900)			PM peak hour (1700-1800)		
	Queue (pcu)	Delay (s)	RFC	Queue (pcu)	Delay (s)	RFC
Base 2024						
North Quay	0.1	3.6	0.07	0.5	4.8	0.32
R772 south	2.7	12.6	0.73	2.0	10.6	0.66
R772 north	0.8	4.4	0.45	0.8	4.4	0.44
Base 2027						
North Quay	0.1	3.7	0.08	0.5	5.0	0.34
R772 south	3.2	14.3	0.76	2.3	11.7	0.69
R772 north	0.9	4.6	0.48	0.9	4.7	0.48
Base 2027 + Dev (113 units)						
North Quay	0.1	3.7	0.08	0.5	5.1	0.35
R772 south	3.4	14.9	0.77	2.6	12.9	0.72
R772 north	1.0	4.8	0.50	1.0	4.8	0.49
Base 2032 + School						
North Quay	0.1	4.0	0.10	0.6	5.4	0.37
R772 south	11.2	42.3	0.93	2.9	14.2	0.74
R772 north	1.4	5.7	0.58	1.1	5.1	0.52
Base 2032 + School + Dev (500 units)						
North Quay	0.1	4.3	0.10	0.7	5.8	0.40
R772 south	12.1	45.1	0.94	4.9	22.0	0.84
R772 north	2.0	7.2	0.66	1.2	5.5	0.55
Base 2042 + School						
North Quay	0.1	4.1	0.10	0.6	5.6	0.39
R772 south	16.4	58.5	0.97	3.5	16.3	0.78
R772 north	1.5	6.0	0.60	1.2	5.4	0.54
Base 2042 + School + Dev (750 units)						
North Quay	0.1	4.5	0.11	0.8	6.2	0.44
R772 south	18.5	64.5	0.98	9.2	38.5	0.92
R772 north	2.6	8.8	0.73	1.3	5.8	0.57

6.8.21 **Table 18** shows that the junction is currently operating within capacity, and this is forecast to be the case when Phase 1A of the development is added in 2027.

6.8.22 In the Base 2032 + School scenario (AM peak hour) the R772 south arm is predicted to operate over capacity when school traffic is added to the R772 mainline movements. Additional traffic from the Phase 1B of the development slightly increases this.

6.8.23 This situation is expected to worsen in 2042, when the R772 south arm is predicted to be over capacity both with the school, and then with the school and development, in place. The analysis shows that school traffic has a large impact on junction performance, with the proposed development traffic increasing this impact to a lesser extent. For example, the RFC of the R772 south arm increases from 0.77 to 0.93 when school traffic is added between 2027 and 2032, but only by a further 0.01 when Phase 1B development traffic is added on top of this.

6.8.24 The junction modelling suggests that mitigation measures may be required at the R772 / North Quay roundabout in 2032. SYSTRA's initial assessment is that the R772 south arm could be slightly widened to allow ahead and right-turning traffic to queue side-by-side. The circulating carriageway on the east side of the roundabout could be widened slightly, to allow ahead and right-turning traffic to proceed at the same time (potentially by using the over-run area on the edge of the central island as a running lane). This would provide a small amount of capacity that would be sufficient to bring the R772 south arm under capacity.

6.8.25 SYSTRA would also note that the introduction of the Western Distributor Road is likely to reduce traffic flows on the R772 as it passes North Quay meaning that the future mitigation measures identified above may not be required.

6.8.26 **R772 / Main Street / Lower Main Street priority junction**

6.8.27 The R772 / Main Street / Lower Main Street priority junction is non-standard junction configuration. Lower Main Street, which forms the eastern arm, is a one-way away street that routes away from the junction. The R772 north, and R772 Main Street (the west arm), form the major arms of the junction. Traffic turning right from the R772 onto Main Street has priority over traffic continuing straight ahead from Main Street onto Lower Main Street, which must give way.

6.8.28 **Table 19** presents the modelled results for the junction.

Table 19. R772 / Lower Main Street Junctions 11 Results

Arm	AM peak hour (0800-0900)			PM peak hour (1700-1800)		
	Queue (pcu)	Delay (s)	RFC	Queue (pcu)	Delay (s)	RFC
Base 2024						
Main Street Lower	0.0	0.0	0.00	0.0	0.0	0.00
R772 Main Street	1.3	6.9	0.38	1.4	8.2	0.42
Base 2027						
Main Street Lower	0.0	0.0	0.00	0.0	0.0	0.00
R772 Main Street	1.5	7.1	0.41	1.8	8.8	0.47
Base 2027 + Dev (113 units)						
Main Street Lower	0.0	0.0	0.00	0.0	0.0	0.00
R772 Main Street	1.6	7.2	0.42	1.9	8.8	0.48
Base 2032 + School						
Main Street Lower	0.0	0.0	0.00	0.0	0.0	0.00
R772 Main Street	3.0	8.4	0.55	2.3	9.7	0.53
Base 2032 + School + Dev (500 units)						
Main Street Lower	0.0	0.0	0.00	0.0	0.0	0.00
R772 Main Street	3.6	9.3	0.59	3.0	10.2	0.58
Base 2042 + School						
Main Street Lower	0.0	0.0	0.00	0.0	0.0	0.00
R772 Main Street	3.6	9.3	0.60	2.8	10.6	0.57
Base 2042 + School + Dev (750 units)						
Main Street Lower	0.0	0.0	0.00	0.0	0.0	0.00
R772 Main Street	5.1	11.8	0.67	4.2	11.9	0.65

6.8.29 **Table 19** shows that the junction is predicted to operate under capacity in each of the modelled scenarios, and no mitigation measures will be required.

6.9 Junction Modelling Conclusion

6.9.1 The key findings from the junction modelling exercise are:

- That the proposed signalisation of the R772 / Beech Road junction will provide sufficient capacity to accommodate the predicted traffic demand from the School Campus, and for 750 residential units on the development site;
- That the R772 / R750 Sea Road junction is expected to operate marginally over capacity in 2042, but this is deemed to be acceptable by SYSTRA given that this is some distance in the future and would be limited to peak hours only;
- That the R772 south arm of the R772 / North Quay roundabout will require mitigation as a result of the School Campus, and to a lesser extent as a result from traffic from the proposed development. SYSTRA's initial assessment is that the R772 south arm could be slightly widened to allow ahead and right-turning traffic to queue side-by-side. The circulating carriageway on the east side of the roundabout could be widened slightly, to allow ahead and right-turning traffic to proceed at the same time (potentially by using the over-run area on the edge of the central island as a running lane); and
- The introduction of the Western Distributor Road is likely to reduce traffic flows on the R772 as it passed Sea Road and North Quay, meaning that the future mitigation measures identified may not be required.

6.10 Mitigation of Impact of Construction Traffic

6.10.1 Prior to commencement of construction, the appointed contractor will be required to prepare a comprehensive and detailed Construction Stage Traffic Management Plan (CTMP), to indicate how it is proposed to manage the traffic impacts during the construction stage and minimise the impact on local residents and businesses.

6.10.2 The CTMP will provide information on the potential location of contractor compounds, likely construction routes used for HGV's and general staff, indicative construction working hours and information regarding the potential sub-phases and associated estimated movements. The CTMP shall be submitted to Wicklow County Council for approval prior to commencement of works.

7. OUTLINE MOBILITY MANAGEMENT PLAN

7.1 Introduction

7.1.1 To support and enable residents to travel to and from the development by sustainable modes, a supporting Outline Mobility Management Plan (OMMP) is set out in this section.

7.1.2 The overall aim of the MMP is to reduce the level of private car use by encouraging people to walk, cycle, use public transport or car share.

7.2 Site Accessibility

7.2.1 As demonstrated in **Chapter 3**, the site is well-located to support walking and cycling trips between the site and the town centre. This will improve significantly when the proposed Boardwalk link and new river crossing is constructed as part of the development.

7.3 Targets

7.3.1 Targets are the specific quantitative goals based on the objective described above. Since the overall aim of the MMP is to reduce reliance upon the private car, it is appropriate to set a target which relates to this objective. The primary outcome indicator used will be the mode share of the residents of the proposed development.

7.3.2 It will therefore be necessary to collect data to identify and understand the post-occupation baseline and ongoing travel habits, against which the MMP's progress can be measured. It is recommended that residents' travel surveys are undertaken within six months of the site reaching occupancy. These travel surveys will establish the post-occupation baseline travel data for the site and inform the final MMP's targets.

7.3.3 Initial pre-occupation and estimated post-occupation targets have been developed, based on the Census 2022 commuting mode share as presented in **Section 5**. These are shown in **Table 20**.

Table 20. Proposed MMP targets

	SINGLE-OCCUPANCY CAR USE	SUSTAINABLE TRAVEL MODES	OTHER
Estimated Pre-Occupation Baseline Mode Share	70%	15%	15%
Longer-term Mode Share Target	55%	31%	5%

7.3.4 The targets are based upon the following primary factors:

- **The location of the development**, within walking and cycling distance of the town centre, and with the co-location on-site of the Kilbride Education Campus;
- **The incorporation of the Local Centre** within the site, which is conveniently located and provides local shop, medical and crèche facilities, ensuring that incidental trips to these local services can be made locally within the site by walking and cycling;
- **The proposed Boardwalk** connection from the south of the site across the Avoca River and into Arklow Town, significalty reducing walking and cycling travel times from the site to the town centre and encouraging greater levels of trips to be made via these modes; and
- **Future initiatives** such as the Western Distributor Road, which will likely see public transport services run through the site.

7.3.5 The longer-term Mode Share target is therefore considered appropriate based on the measures outlined above.

7.3.6 The final mode share targets over a three and five-year period will be set once the post-occupation baseline mode share is known, which will be obtained through the baseline residential travel surveys described above.

7.4 Proposed MMP Action Plan Measures

7.4.1 To achieve the MMP targets set out above, a number of measures have been identified. These are:

- Appointment a Mobility Manager;
- Provision of a Welcome Travel Pack for residents;
- The provision of clear pedestrian and cycle signage and maps throughout the site, showing travel times to key destinations;
- The provision of space for two bike hire hubs on the site; and
- Measures to encourage Public Transport use, including liaising with local bus operators regarding bus scheduling, routes and school travel.

7.5 Mobility Manager

7.5.1 A Mobility Manager will be appointed to deliver the MMP. The role involves being the main point of contact for travel information, promotion and improvements, and the coordination and monitoring of the agreed measures.

Welcome Travel Pack

7.5.2 A 'Welcome Travel Pack' will be provided to all new residents when they first move in, so that each household is made fully aware of the travel choices available to them. This will also give the best possible opportunity to the new residents to consider more sustainable modes of travel at a key moment of life change (i.e. moving home) – where new travel habits are more easily encouraged.

7.5.3 The Welcome Travel Pack will include a variety of sustainable travel information and incentives about the development and the wider local area. It can include measures such as:

- Information on the site's available sustainable travel links and on-site facilities;
- Incentives to trial sustainable travel, for example such as:
  - Public transport 'taster tickets' for each resident;
  - Discounts at a local bike shop to subsidise a bike purchase; free branded cycling accessories (e.g. high vis reflectors, seat covers, water bottles); free or subsidised cycle skills training or cycle maintenance training;
- This can be offered to residents on a 'pick-and-mix' basis up to a certain value (e.g. €100), with residents selecting the incentive package that best meets their own individual travel needs;
- Information on services and amenities provided locally (both on-site and nearby), particularly those within walking and cycling distance at the Local Centre;
- Maps showing the pedestrian and cycle routes in proximity to the site, including site cycle parking; advised routes (with journey times) to accessible destinations;
- Information about local public transport services and tickets, including a plan showing the location of bus stops, and bus routes to rail stations;
- Information on the health benefits of walking and cycling;
- Details of online car-sharing services (e.g. Liftshare[1] and Faxi[2]) along with the benefits of car sharing, such as reduced congestion, better air quality, reduction in traffic noise and cost savings to the individuals taking part; and
- Provide information on the financial and environmental costs associated with driving and support regarding tips for green driving techniques.

Information Board and Signage

7.5.4 The developer will investigate the provision of a central high-quality travel information board within the site, likely to be within the Local Centre, which will comprise a map showing walking, cycling and public transport routes in the local, and wider area, along with key destinations. For walking and cycling routes, this would show approximate travel times and distances.

7.5.5 Suitable signposts will be located within the site, to guide pedestrians and cyclists through the site.

Public Transport

[1] Not currently operating in Ireland but are planning to enter the market.
[2] Private groups are set up and not open to the general public. FAXI offers closed company groups with member access controlled by the group administrator which could be operated by the Mobility Manager.

7.5.6 Depending on the outcome of the post-occupation travel survey, the following measures can be implemented to promote public transport to residents:

- The provision of timetables and maps of local bus routes and the nearest bus stops on the proposed central information board; and
- The board can also promote the National Public Transport Journey Planner (www.journeyplanner.transportforireland.ie) for travel by bus and rail.

7.5.7 The Mobility Manager will liaise with the NTA and local bus operators regarding current bus services, and future new services, and provide two-way feedback between these organisations and residents (via the site notice board).

7.6 MMP Monitoring and Review

7.6.1 This section sets out the monitoring strategy for the Mobility Management Plan. The monitoring strategy is important for assessing how effectively the MMP has been in achieving its aim, objectives and targets. It can help identify measures that are not meeting objectives and reallocate resources accordingly.

7.6.2 An MMP is a continuous and evolving document requiring monitoring, review and revision to ensure that it remains relevant.

Travel Survey

7.6.3 As already stated, it is recommended that a travel survey of residents is undertaken within six months following occupation of the proposed development. The results of the survey will identify baseline travel patterns in terms of modes used and the sustainable transport modes which require encouragement through the MMP measures.

7.6.4 The results of the survey will be used to inform the development of the finalised MMP targets and measures. The survey is designed to identify the distribution and mode share of trips from the development. The survey will also identify people's willingness and ability to try new modes, and what barriers they may face in making Smarter Travel choices.

Annual Monitoring

7.6.5 The Mobility Manager will carry out annual follow-up travel surveys with future residents and staff. These surveys should take place in the same month and be of the same format as the original baseline survey to ensure compatibility of results. This monitoring is an opportunity to measure MMP achievements on an annual basis. This will then inform the ongoing development of the MMP, ensuring its targets and measures remain relevant to the needs of the residents, is site-specific and fit for purpose. Results will be analysed to enable the following:

- Measurement of the success of the MMP, enabling focused improvement on areas that have not achieved the desired modal shift via appropriate revisions to the MMP measures.
- Identification of early success stories of the MMP, which can help to encourage further participation and build momentum for sustainable travel.
- Ensures that changing travel patterns are considered, ensuring that the MMP measures can be updated to reflect the needs of development users.

- Allows targets which have been set too low or unrealistically high to be readjusted.

Reporting

7.6.6 Reporting of the results of the Post-Occupation Baseline Travel Survey, and findings from the ongoing monitoring activities and progress with implementation of the MMP will be agreed with WCC.

8. SUMMARY & CONCLUSIONS

8.1 Summary

8.1.1 Introduction

8.1.2 SYSTRA Ltd has been commissioned by Certain Assets of Dawnhill and Windhill Ltd (CADW) to prepare a Traffic & Transport Assessment (TTA) and Outline Mobility Management Plan (OMMP) in relation to a proposed Large Scale Residential Development (LRD) in Kilbride, Arklow, Co. Wicklow.

8.1.3 The purpose of this report is to set out the likely transport impacts of the proposals, and to identify measures to ensure that the development can be successfully integrated into the local transport network.

8.1.4 The development site is located on the northern side of the Avoca River in Arklow, Co. Wicklow, within the development boundary of Arklow Town, in the townland of Kilbride.

8.1.5 The site is designated within the prevailing Arklow and Environs Local Area Plan (LAP) 2018-2024 as part of Action Area Plan 3 (AAP3).

8.1.6 It is envisaged that the proposals for the wider AAP3 site will be progressed in two distinct phases, each with standalone planning applications; the proposed development therefore represents Phase 1 of the overall masterplan for the lands, comprising 666 residential units and ancillary commercial/community/medical centre and crèche facilities, and supporting infrastructure including the construction of a new internal access road to serve the site.

Transport Baseline

8.1.7 As a greenfield site, existing footpaths and cycle facilities are currently limited to those on or alongside the roads around the site.

8.1.8 The closest bus services to the site run along the R772 Dublin Road. These typically operate on an hourly basis throughout the week.

8.1.9 Arklow Train Station is located in the centre of the town, approximately 3.2km from the site access on Kilbride Road, but access to the station will be greatly improved with the addition of the proposed Boardwalk link and pedestrian/cycle bridge across the Avoca River into the town centre.

8.1.10 In terms of road access, the development will be accessed from Kilbride Road, which is itself reached via the R772 Dublin Road / Beech Road priority junction. This would be upgraded to a signalised junction as part of the proposals.

8.1.11 There are a number of planned initiatives which will greatly enhance sustainable and active travel for residents of the site. These include:

- The IT5 Western Distributor Road, to be constructed through the Kilbride lands, to incorporate a new river crossing and to link Kilbride to the Vale Road, Lamberton Avenue and the Coolgreaney Road. This is intended to alleviate traffic congestion on the existing R672 Nineteen Arches Bridge, and would also feature segregated

cycle provision, and allow a bus route to pass directly through the development site.

- The NTA's Greater Dublin Area (GDA) Cycle Network Plan (2022), which includes comprehensive proposals for cycle facilities within Arklow town, and specifically in the area of the development.
- The boardwalk and bridge connection, which will be provided as part of the development, will form an important part of the Arklow cycle network, providing a high-quality segregated pedestrian and cycle connection through to the town centre. It will also allow pupils at the Kilbride Education Campus who live south of the river to directly access the site without travelling along R772 Dublin Road.

Proposed Development

8.1.12 The Phase 1 development would provide circa 750 residential units (this includes the 84no. units covered by application Ref. 23/745, labelled as Phase 1A), comprising a mixture of houses and apartments.

8.1.13 In addition to the residential properties, the development will contain a Local Centre (located in the west of the site), which will include retail, community and medical units, and a crèche.

8.1.14 The main features of the site design from a transport perspective are:

- Vehicle access will be taken from Kilbride Road, which will be realigned and have the existing priority changed, so that the link into the Kilbride Education Campus and Phase 1 access road becomes the priority route;
- All vehicle traffic to and from the site will travel via the R772 Dublin Road / Beech Road priority junction, which will be upgraded to a signalised junction as part of the proposals;
- The new link that will run through the site, and the sections of Kilbride Road and Beech Road will be constructed to Regional Road standard and will form the first part of the IT5 Western Distributor Route proposed in the Arklow LAP. Upgrades to the L6179 to provide pedestrian facilities are also included;
- Two new pedestrian/cyclist links connecting into Arklow Town Centre are proposed:
  - Via the Marshland sports club and through into Avondale Crescent.
  - Via a new boardwalk and pedestrian/cycle bridge across the marsh, and over the Avoca River to meet the south bank.
- The new Link Road has been designed to accommodate a future bus route, if implemented;
- The site layout will allow for the future extension of the IT5 Link Road across the Avoca River; and
- The internal site layout has been designed in accordance with the Design Manual for Roads and Streets (DMURS), and the Cycle Design Manual (2023).

Site Phasing

8.1.15 The following indicative phasing is proposed within the overall Phase 1 development:

- **Phase 1A (2027)** – 113 units (including the consented 84 units);

- **Phase 1B (2032)** – an additional 387 units, bringing the total to 500 units. The Local Centre would be constructed in this Phase, along with the Avoca Boardwalk link and pedestrian/cycle bridge; and
- **Phase 1C (2042)** – an additional 250 units, bringing the total to 750 units.

Trip Generation

8.1.16 Prior to construction of the Avoca Boardwalk, Local Centre and school, the mode split from the site is likely to reflect Census 2022 data, which shows that around 70% of residents currently living in the area travel to work by car.

8.1.17 SYSTRA has used the TRICS database, and a 'target' mode share (based on future transport initiatives and the aspirations of the Government's 'Climate Action Plan', to estimate future travel demands from the development.

8.1.18 It is estimated that, when complete, the development will generate around 700 person trips in the AM peak hour, and around 600 in the PM peak hour. Of these trips, 55% are likely to be as car driver, 15% by walking, 10% by bus, and 6% by cycle.

8.1.19 The co-location of the Kilbride Educational Campus and Local Centre on site will mean that many of these trips will be retained within the site itself.

Traffic Impacts

8.1.20 SYSTRA has undertaken junction capacity modelling at four junctions:

- R772 / Beech Road existing priority / new signalised junction;
- R772 / R750 Sea Road priority junction;
- R772 / North Quay roundabout; and
- R772 / Main Street / Lower Main Street priority junction

8.1.21 This modelling was informed by traffic surveys undertaken in 2024, and takes into account traffic generated by the Kilbride Education Campus. The key findings from the junction modelling exercise are:

- That the proposed signalisation of the R772 / Beech Road junction will provide sufficient capacity to accommodate the predicted traffic demand from the School Campus, and for 750 residential units on the development site;
- That the R772 / R750 Sea Road junction is expected to operate marginally over capacity in 2042, but this is deemed to be acceptable by SYSTRA given that this is some distance in the future, and would be limited to peak hours only.
- That the R772 south arm of the R772 / North Quay roundabout will require mitigation by 2032 as a result of the School Campus, and to a lesser extent as a result from traffic from the proposed development. SYSTRA's initial assessment is that the R772 south arm could be slightly widened to accommodate this.
- The introduction of the Western Distributor Road is likely to reduce traffic flows on the R772 as it passed Sea Road and North Quay, meaning that the future mitigation measures identified may not be required. No allowance has been made for any reduction of traffic associated with the proposed Western Distributor Road.

Mobility Management Plan

8.1.22 An Outline Mobility Management Plan (OMMP) has been prepared by SYSTRA. This sets out how active travel and sustainable travel will be encouraged and promoted within the site. This will be further developed and will evolve over time in line with the site occupation.

8.2 Conclusion

8.2.1 The proposed Phase 1 development represents the next major step in the development of the wider AAP3 site, which represents a major, long-term development in Arklow.

8.2.2 The proposed residential development will complement the consented Education Campus, meaning that many pupils will live close to their school. The proposed Local Centre will provide many of the day-to-day needs of residents, meaning that travel outside the site will be reduced.

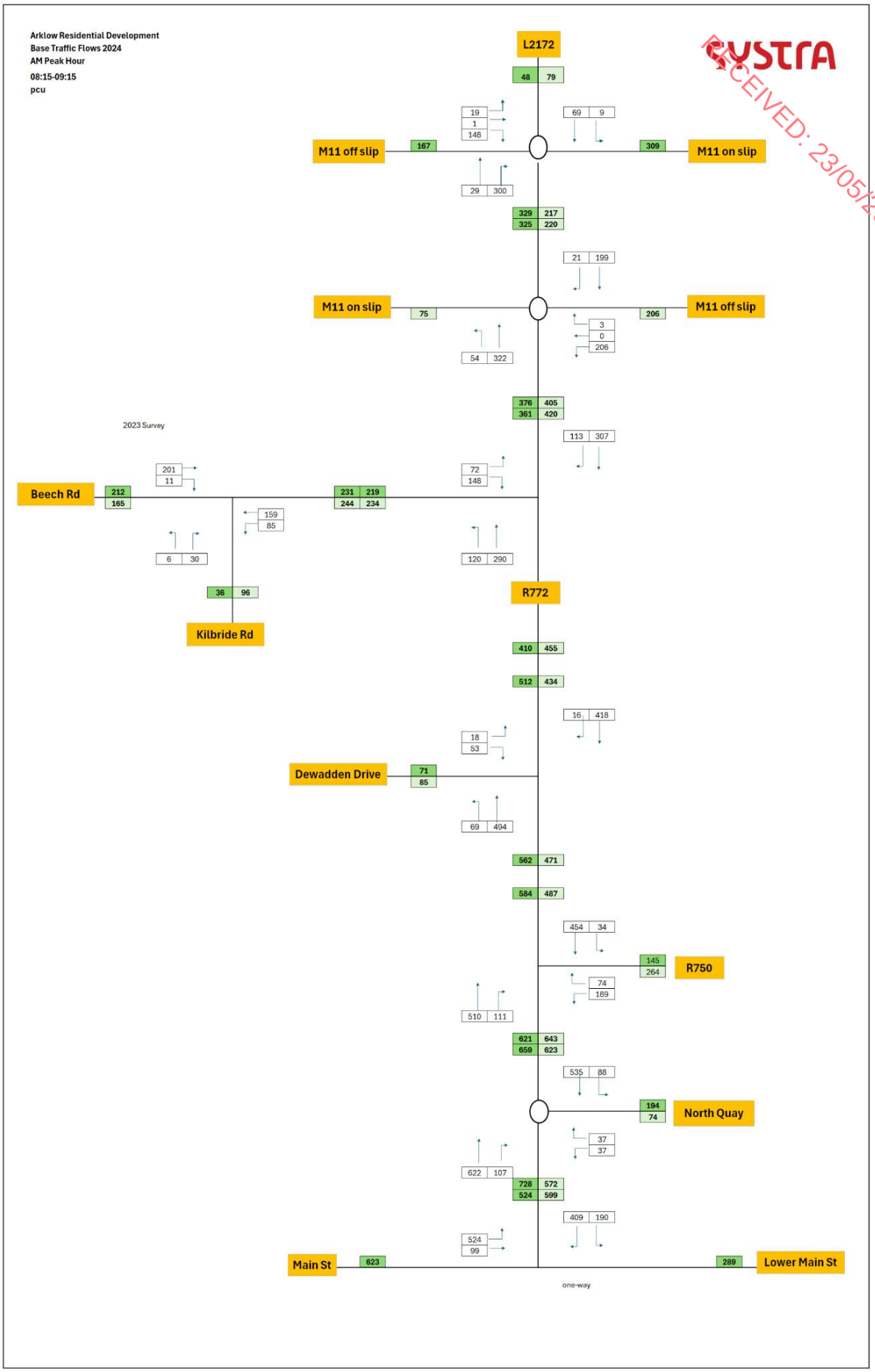
8.2.3 The proposed boardwalk connection into the town centre is a key feature of the development, which will greatly support walking and cycling trips due to the short distance to Arklow Town Centre and will reduce traffic pressure on the R772 in particular.

8.2.4 The Transport Assessment has found that the Phase 1 development can be successfully integrated into the local area, with the proposed access strategy and identified mitigation measures in place.

8.2.5 Looking beyond Phase 1, the development of the Western Distributor Route will greatly change travel patterns within Arklow, reducing traffic pressure on the sole bridge crossing, and opening up a key new corridor for vehicles, buses and cycles. It is likely that Phase 2 of the development will be enabled by this scheme.

APPENDICES

Appendix A – Turn Count Diagrams


Arklow Residential Development
Base Traffic Flows 2024
AM Peak Hour
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pcu
RECEIVED: 23/05/2025
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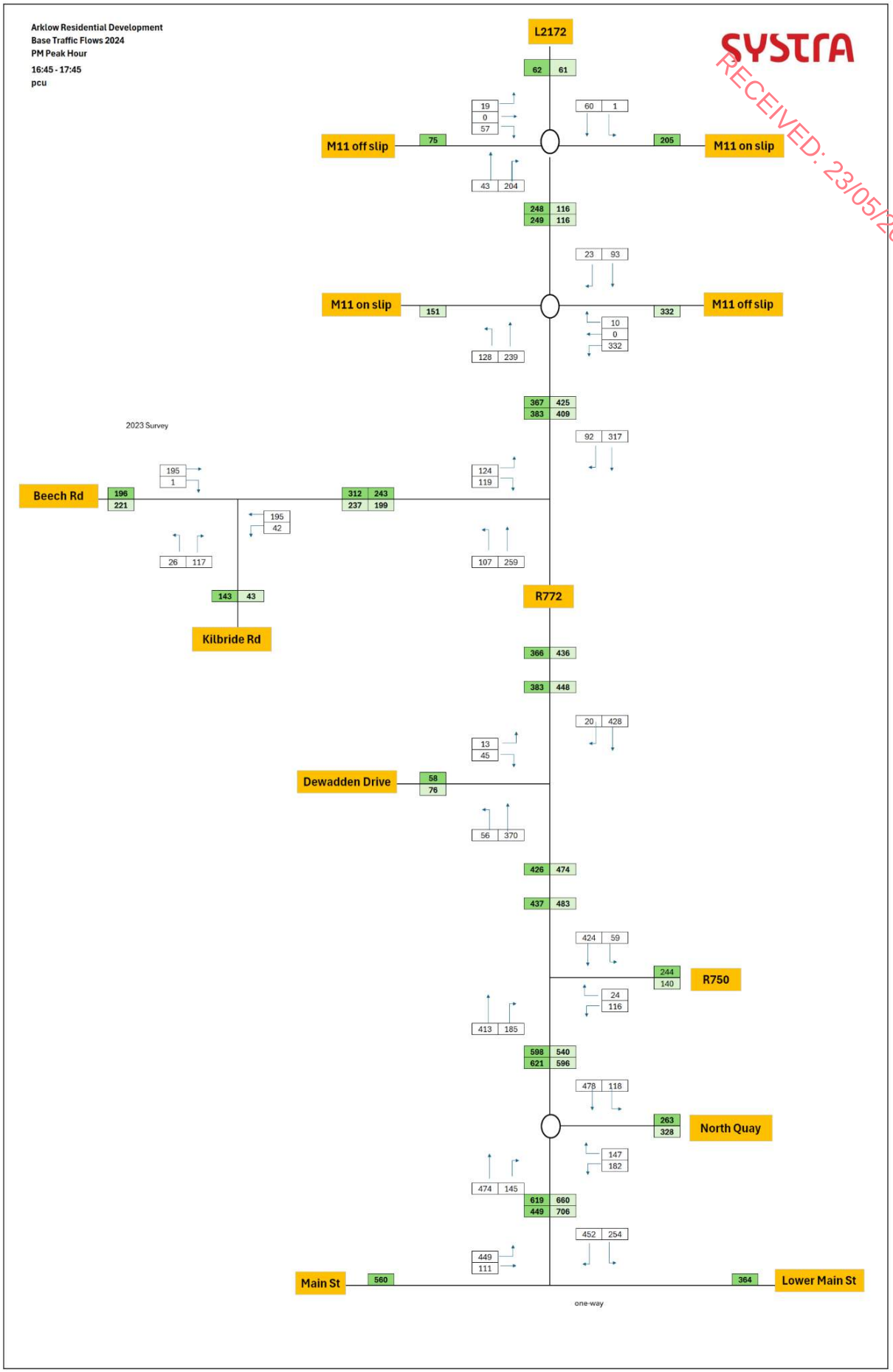
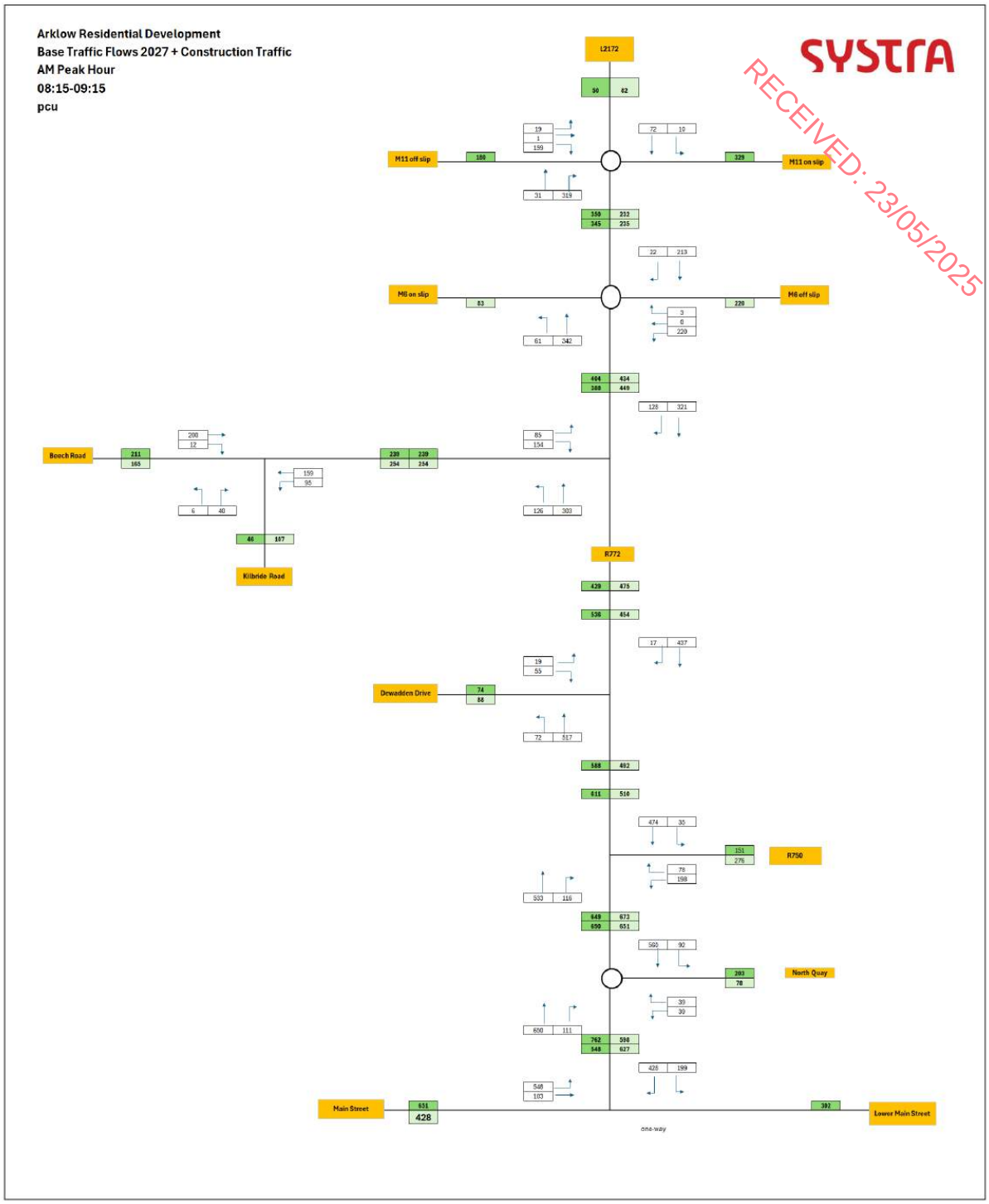
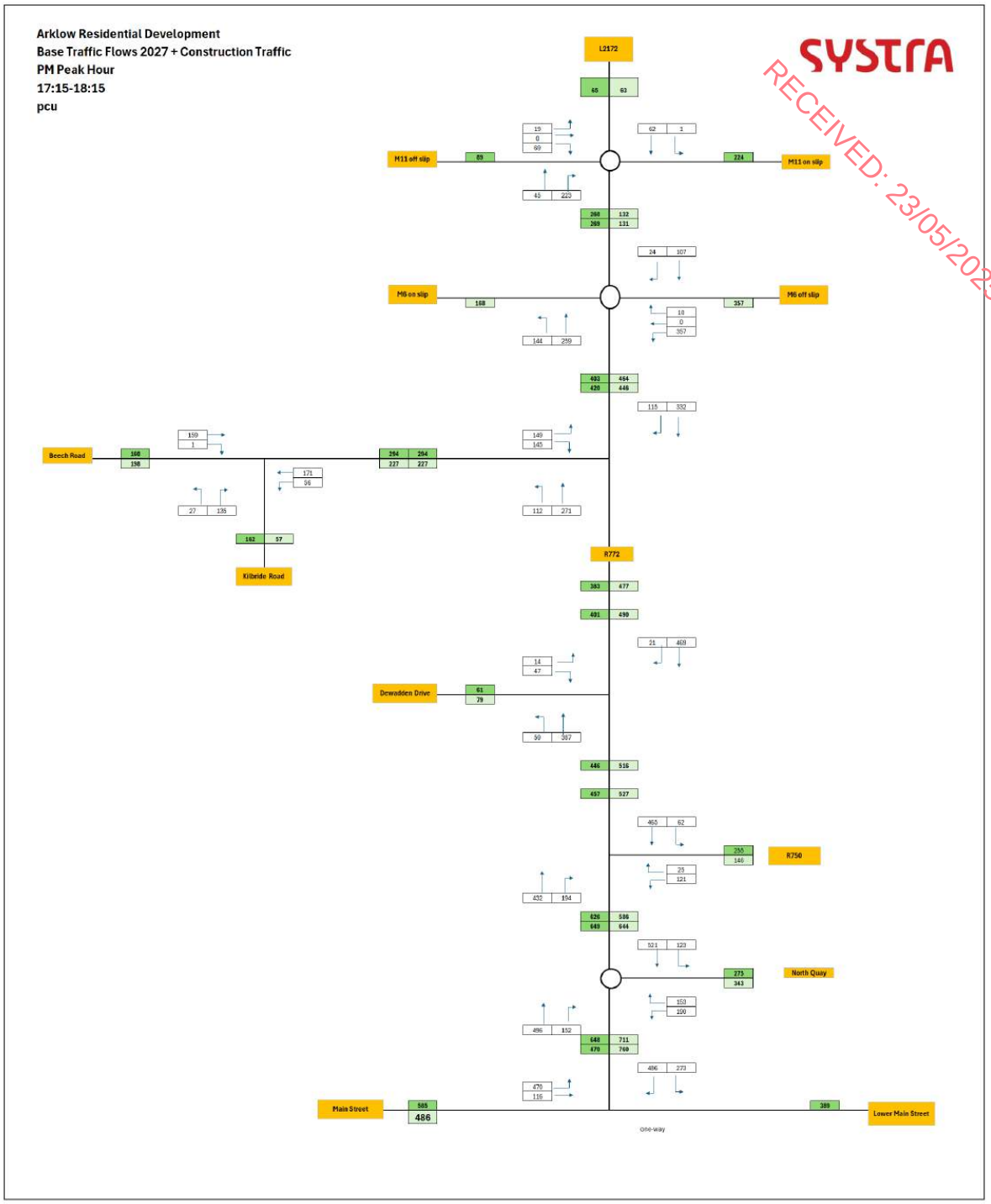
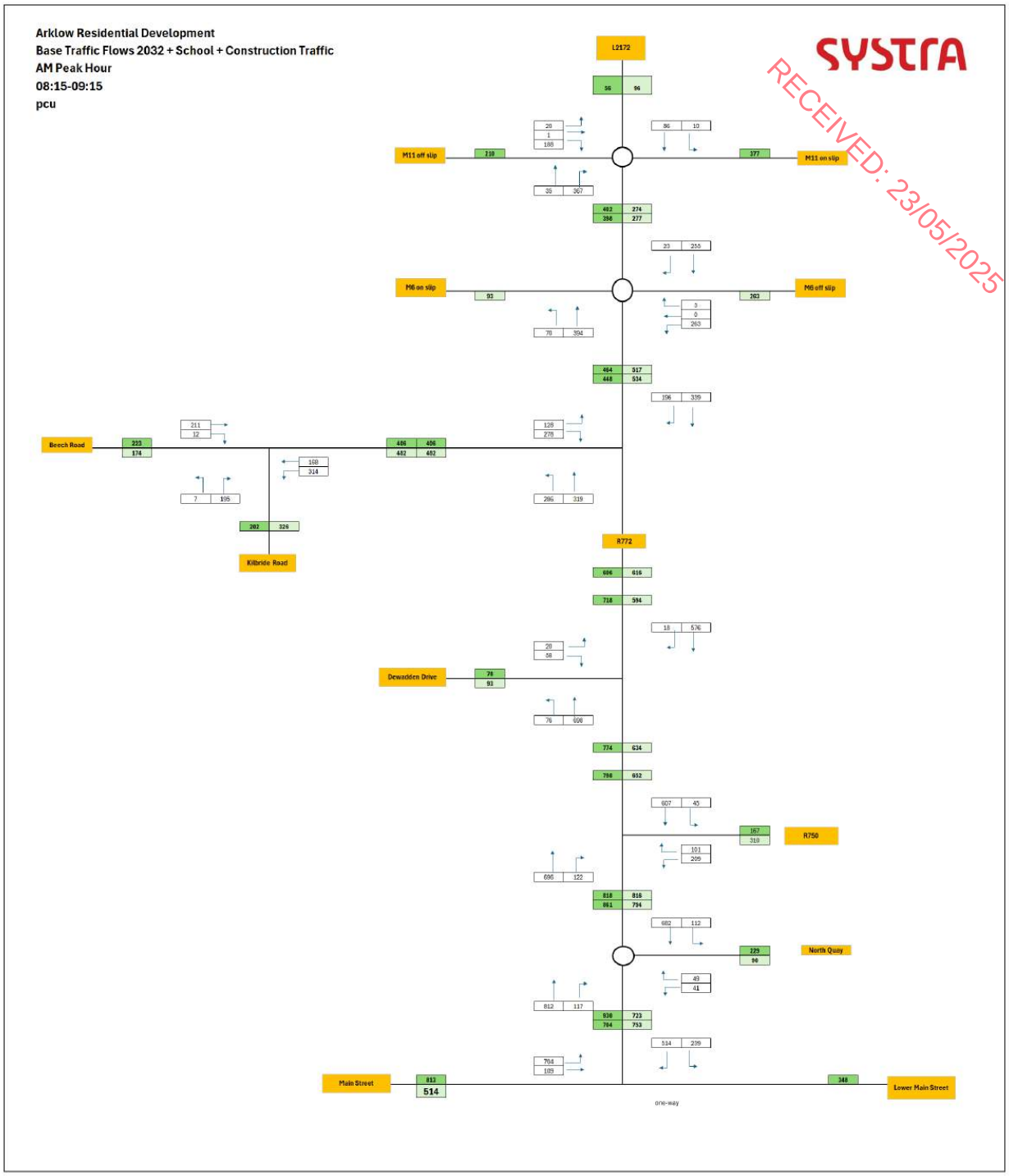
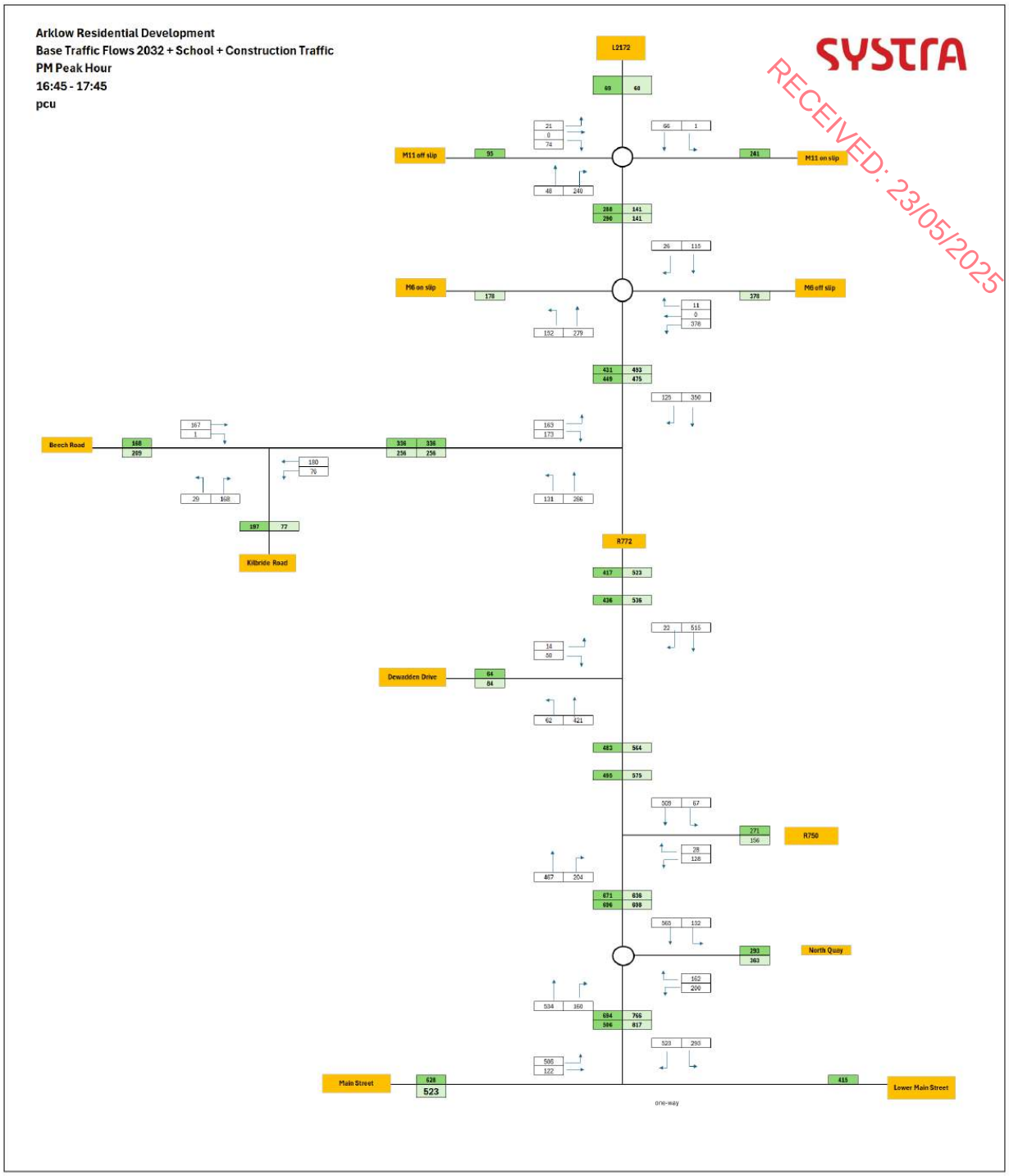
M11 off slip
167
309
M11 on slip
29 300
329 217
325 220
21 199
M11 on slip
75
206
M11 off slip
3 0 206
54 322
376 405
361 420
2023 Survey
113 307
201 11
72 148
Beech Rd
212 165
231 219
244 234
159 85
6 30
120 290
36 96
R772
Kilbride Rd
410 455
512 434
16 418
18 53
Dewadden Drive
71 85
69 494
562 471
584 487
454 34
145 264
R750
74 189
510 111
621 643
659 623
535 88
194 74
North Quay
37 37
622 107
728 572
524 599
409 190
524 99
Main St
623
289
Lower Main St
one-way

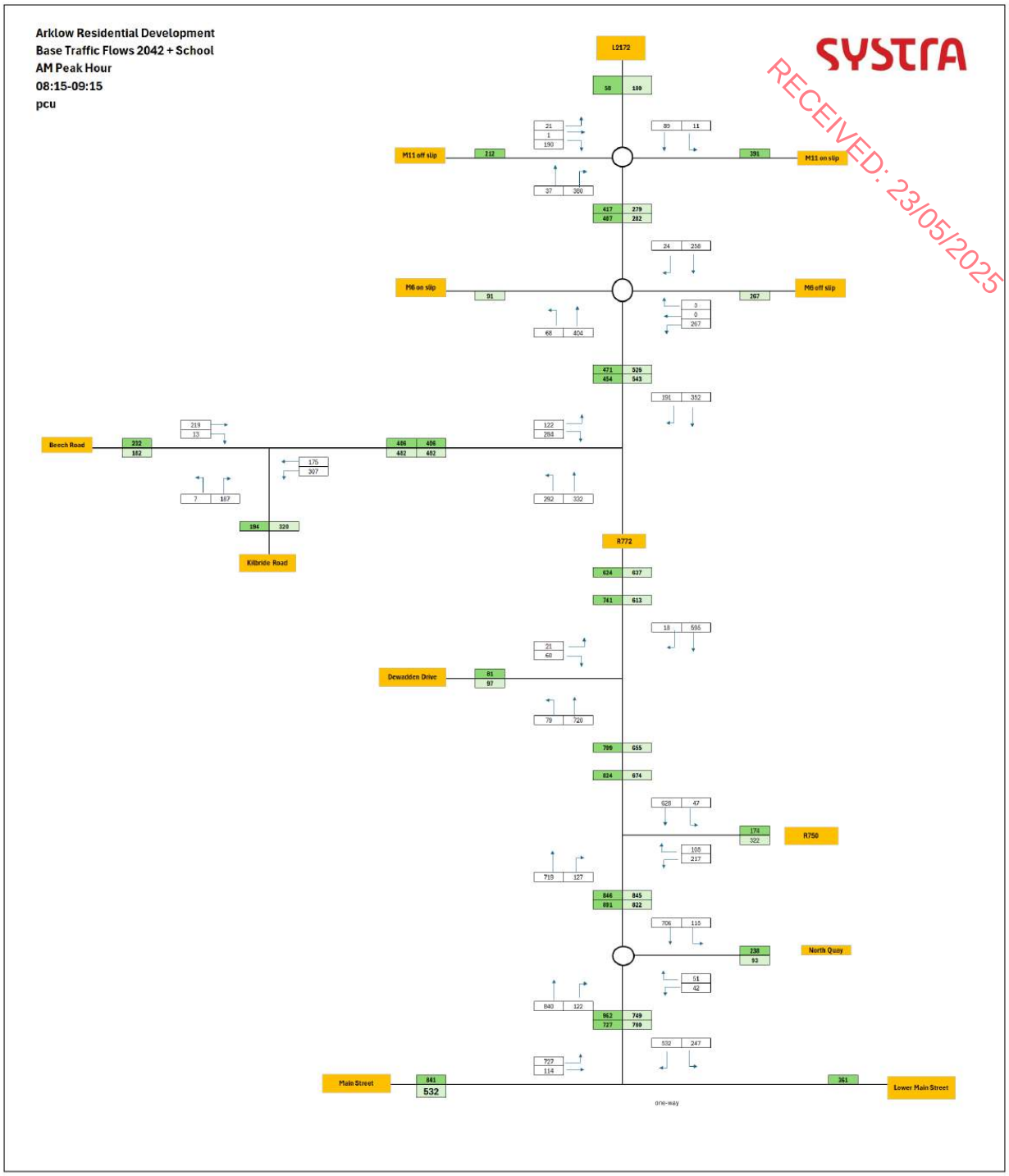

Arklow Residential Development
Base Traffic Flows 2024
PM Peak Hour
16:45 - 17:45
pcu
SYSTRA
RECEIVED: 23/05/2025
L2172
62 61
19 0 57
60 1
M11 off slip
75
205
M11 on slip
43 204
248 116
249 116
23 93
M11 on slip
151
332
M11 off slip
10 0 332
128 239
367 425
383 409
2023 Survey
92 317
195 1
124 119
Beech Rd
196 221
312 243
237 199
195 42
26 117
107 259
143 43
R772
Kilbride Rd
366 436
383 448
20 428
13 45
Dewadden Drive
58 76
56 370
426 474
437 483
424 59
244 140
R750
24 116
413 185
598 540
621 596
478 118
263 328
North Quay
147 182
474 145
619 660
449 706
452 254
449 111
Main St
560
364
Lower Main St
one-way

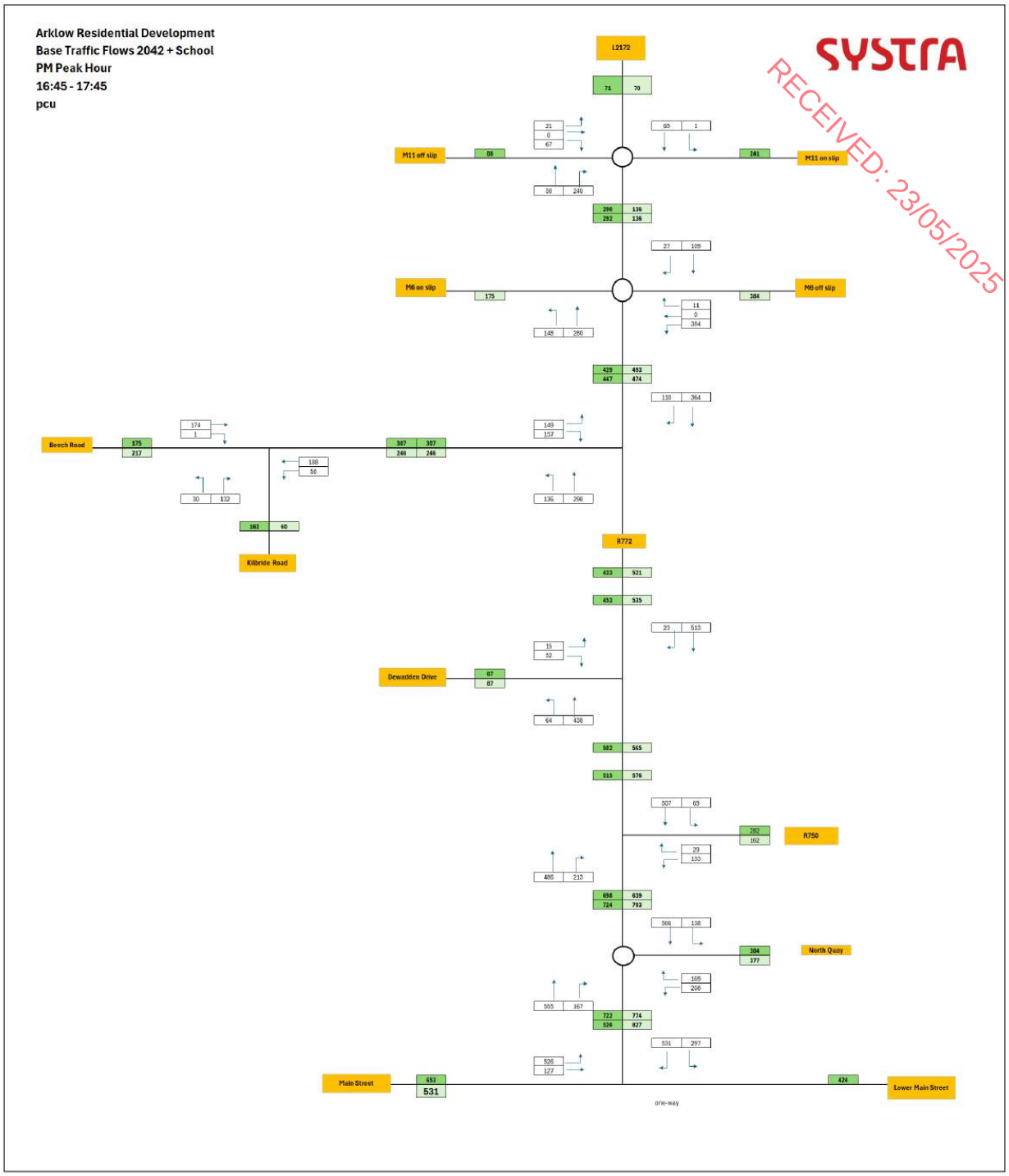

Arklow Residential Development
Base Traffic Flows 2027 + Construction Traffic
AM Peak Hour
08:15-09:15
pcu
SYSTRA
RECEIVED: 23/05/2025
L2172
M11 off slip
M11 on slip
M8 on slip
M8 off slip
Beech Road
Kilbride Road
R772
Dewadden Drive
R750
North Quay
Main Street
Lower Main Street
428
one-way

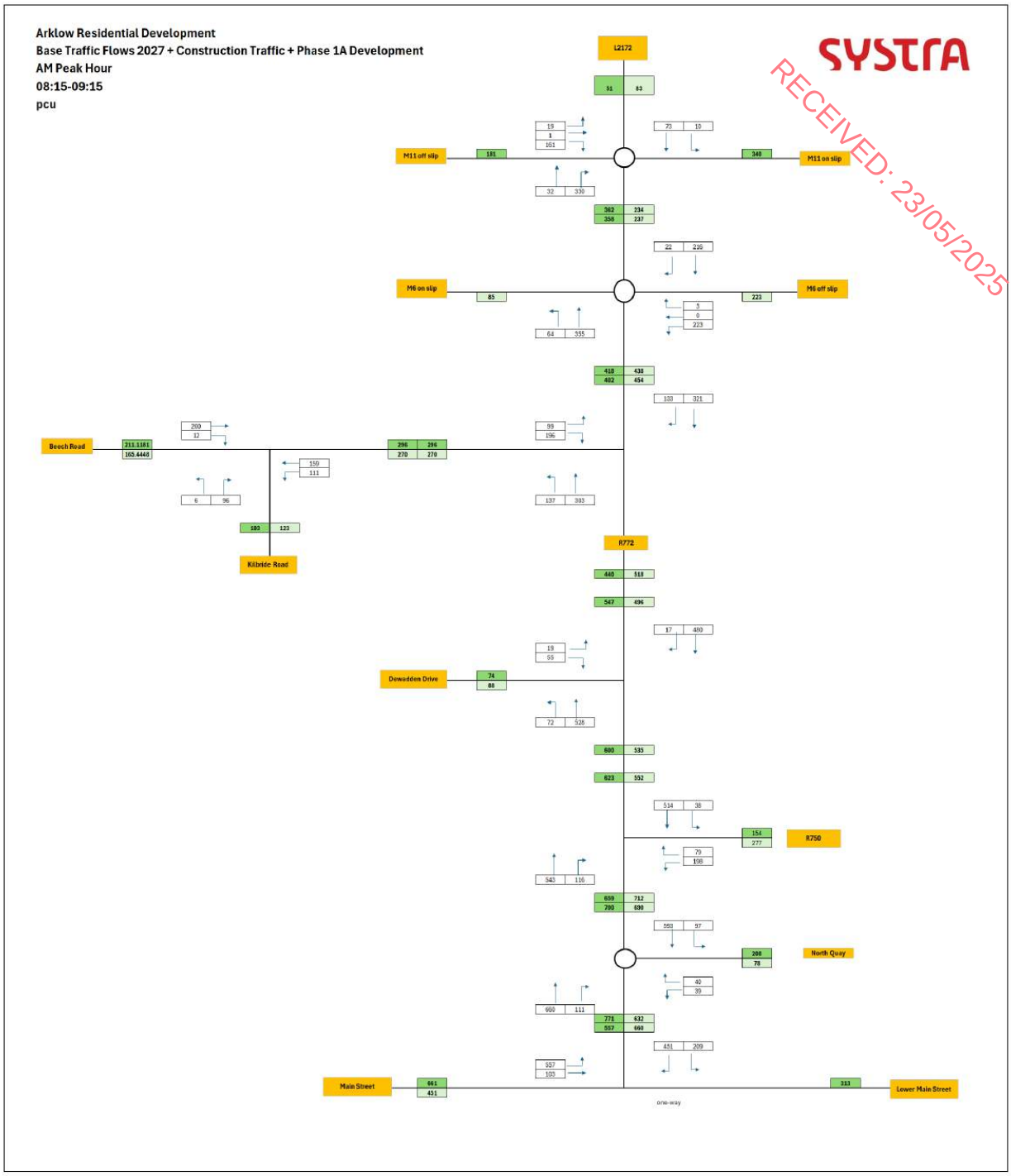

Arklow Residential Development
Base Traffic Flows 2027 + Construction Traffic
PM Peak Hour
17:15-18:15
pcu
SYSTRA
RECEIVED: 23/05/2025
L2172
M11 off slip
M11 on slip
M6 on slip
M6 off slip
Beech Road
Kilbride Road
R772
Dewadden Drive
R750
North Quay
Main Street
Lower Main Street
one-way

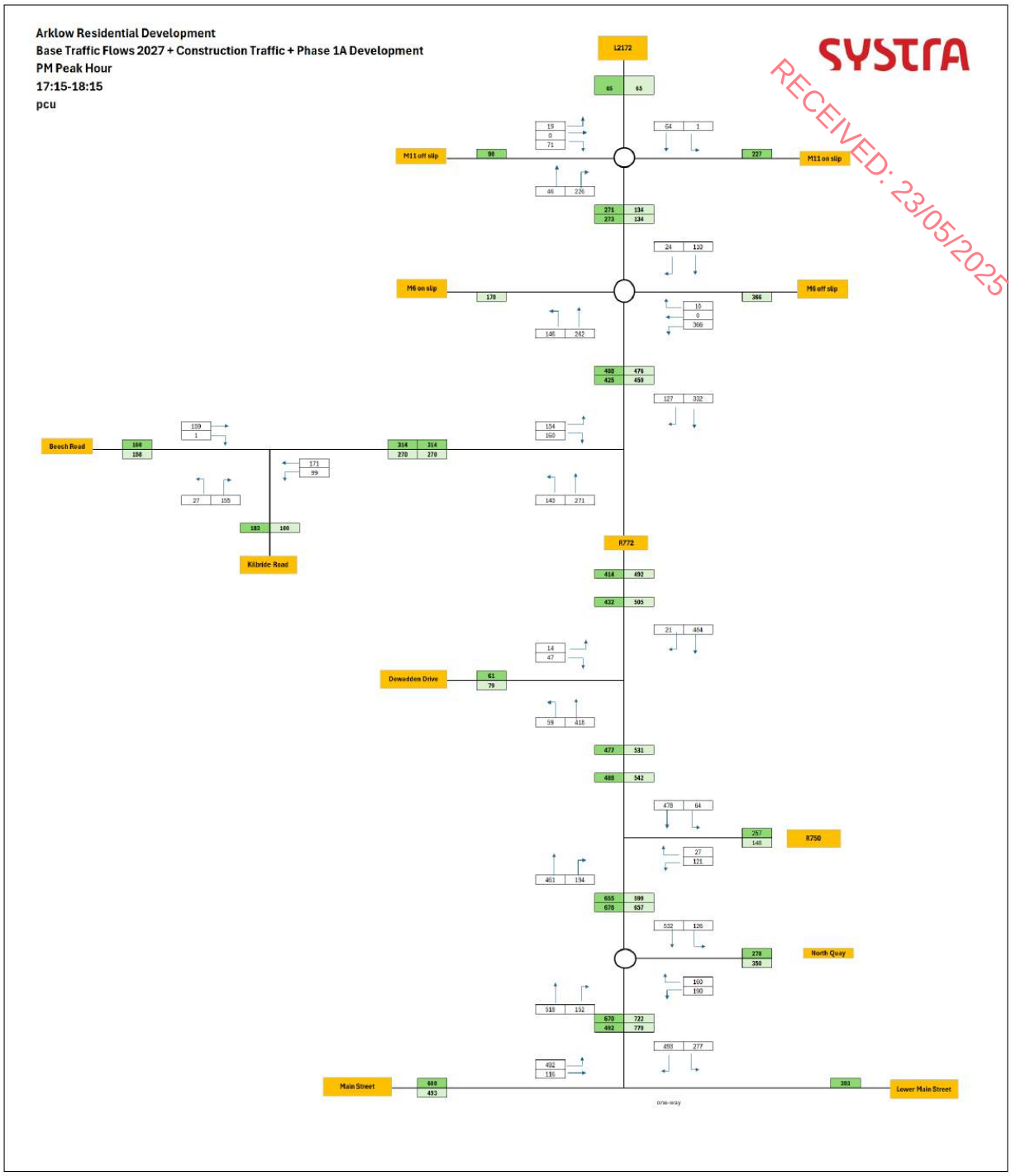

Arklow Residential Development
Base Traffic Flows 2032 + School + Construction Traffic
AM Peak Hour
08:15-09:15
pcu
SYSTRA
RECEIVED: 23/05/2025
L2172
M11 off slip
M11 on slip
M6 on slip
M6 off slip
Beech Road
R772
Kilbride Road
Dewadden Drive
R750
North Quay
Main Street
Lower Main Street
one-way

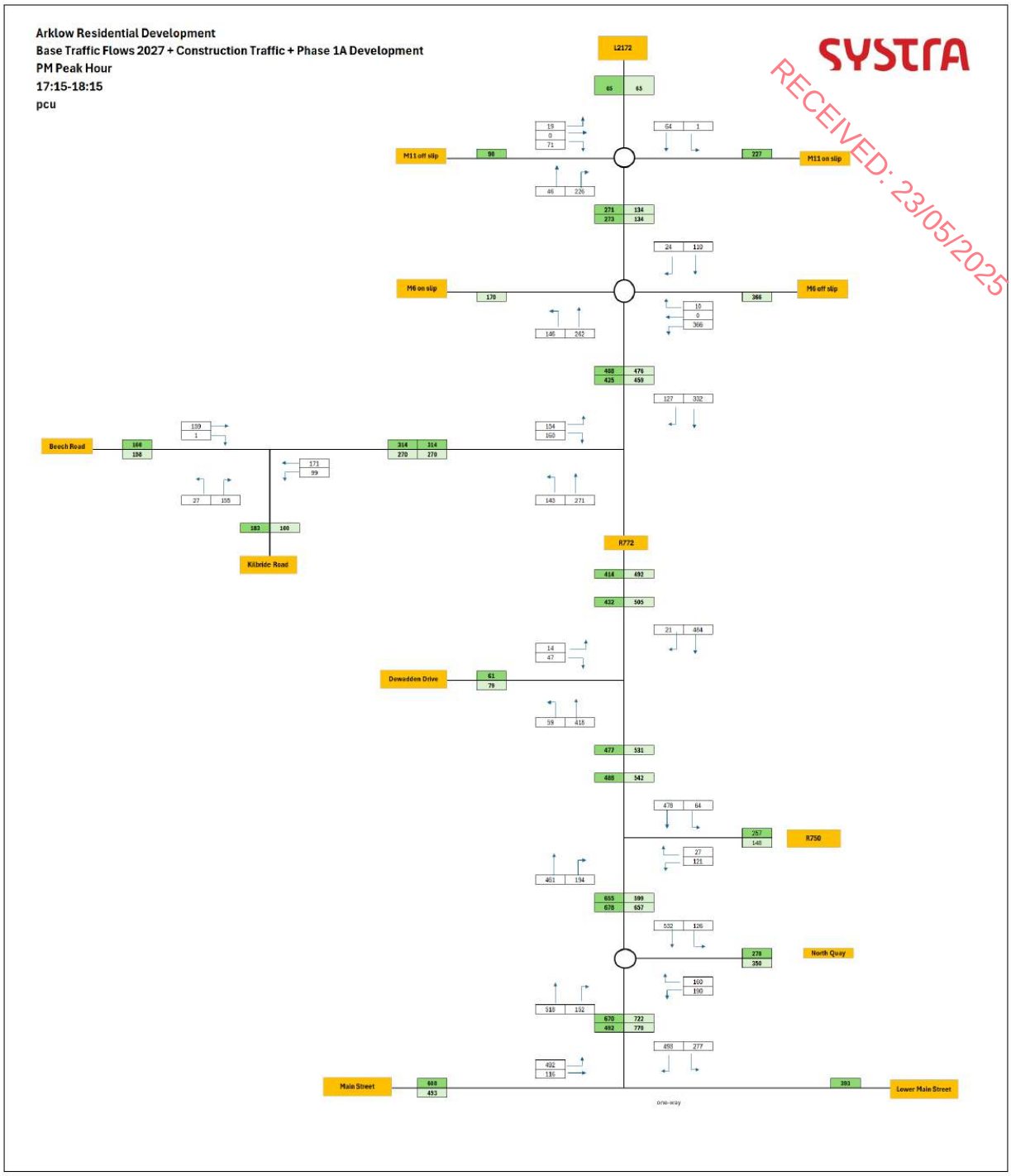

Arklow Residential Development
Base Traffic Flows 2032 + School + Construction Traffic
PM Peak Hour
16:45 - 17:45
pcu
SYSTRA
RECEIVED: 23/05/2025
L2172
M11 off slip
M11 on slip
M6 on slip
M6 off slip
Beech Road
Kilbride Road
R772
Dewadden Drive
R750
North Quay
Main Street
Lower Main Street
one-way

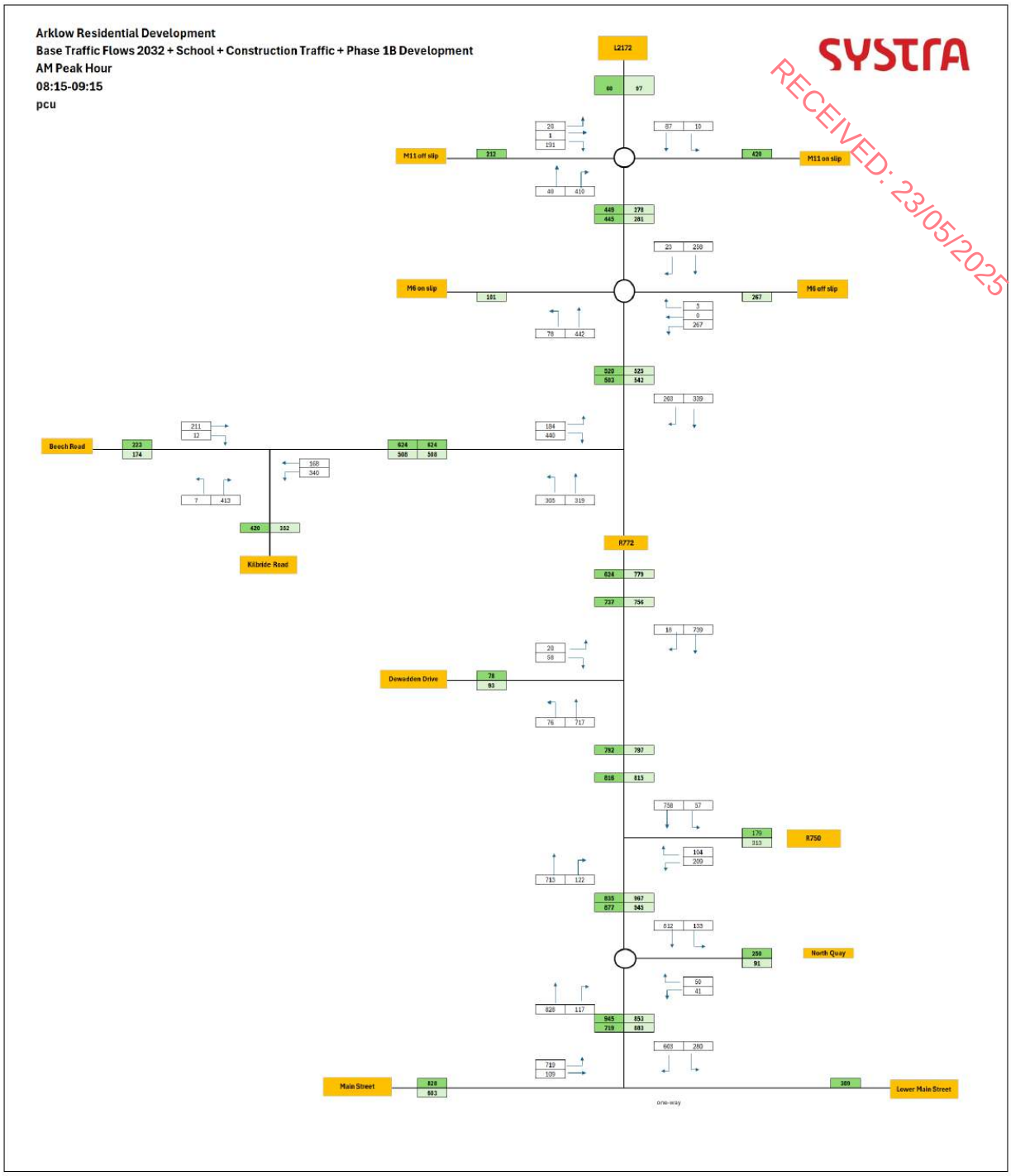

Arklow Residential Development
Base Traffic Flows 2042 + School
AM Peak Hour
08:15-09:15
pcu
SYSTRA
RECEIVED: 23/05/2025
L2172
M11 off slip
M11 on slip
M6 on slip
M6 off slip
Beech Road
Kilbride Road
R772
Dewadden Drive
R750
North Quay
Main Street
Lower Main Street
one-way

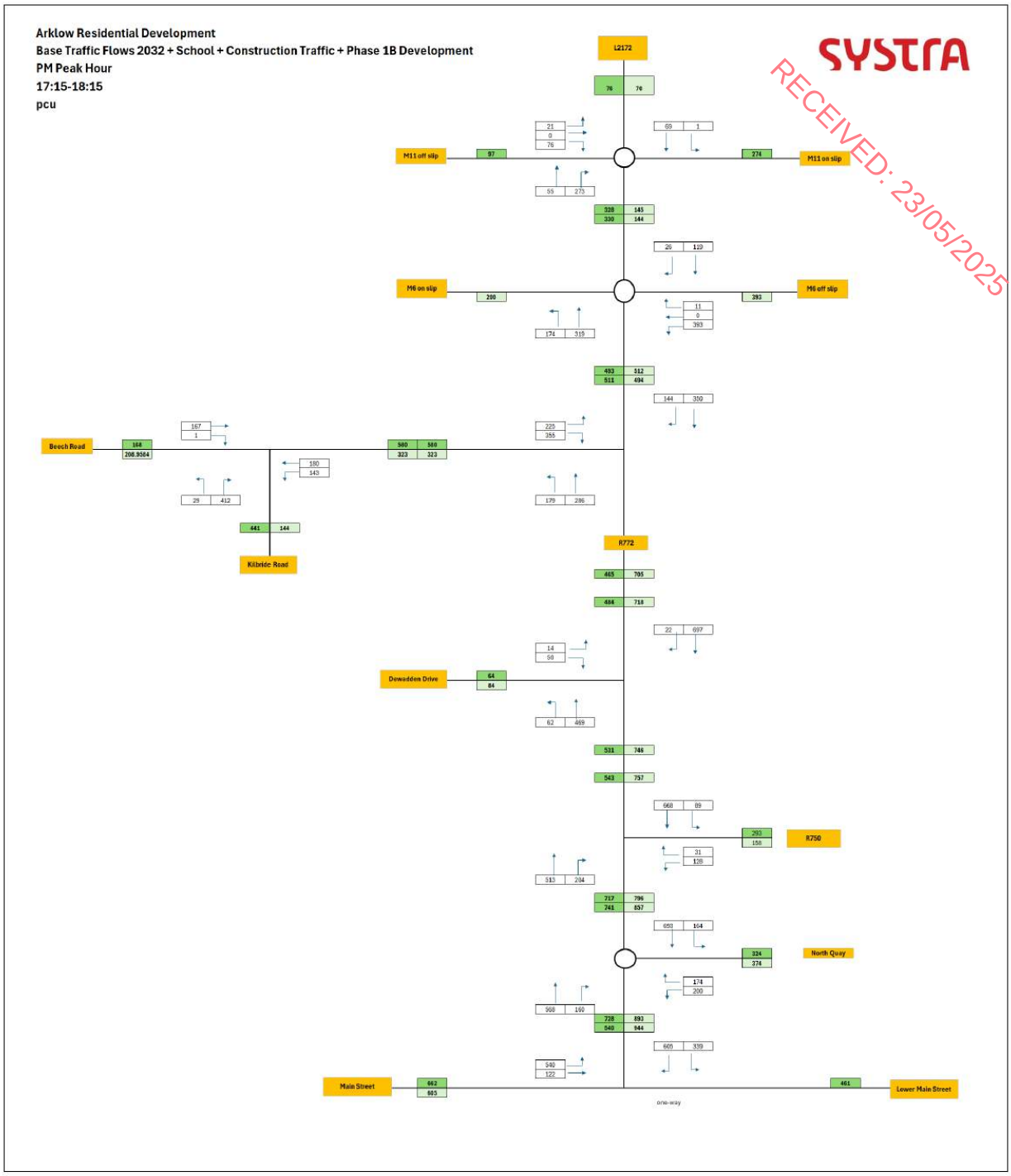

Arklow Residential Development
Base Traffic Flows 2042 + School
PM Peak Hour
16:45 - 17:45
pcu
SYSTRA
RECEIVED: 23/05/2025
L2172
M11 off slip
M11 on slip
M6 on slip
M6 off slip
Beech Road
Kilbride Road
R772
Dewadden Drive
R750
North Quay
Main Street
Lower Main Street
one-way

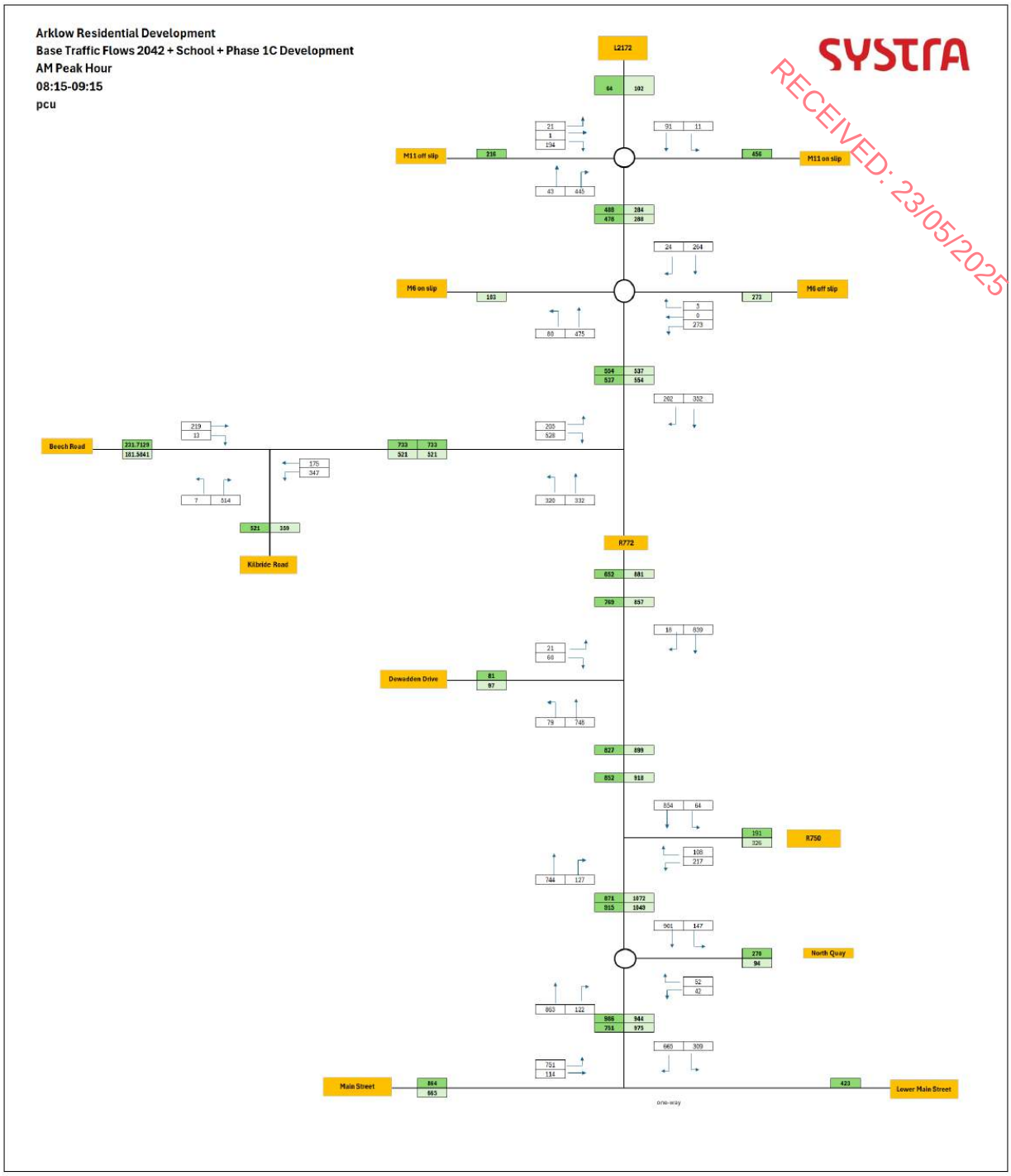

Arklow Residential Development
Base Traffic Flows 2027 + Construction Traffic + Phase 1A Development
AM Peak Hour
08:15-09:15
pcu
SYSTRA
RECEIVED: 23/05/2025
L2172
M11 off slip
M11 on slip
M6 on slip
M6 off slip
Beech Road
Kilbride Road
R772
Dewadden Drive
R750
North Quay
Main Street
Lower Main Street
one-way

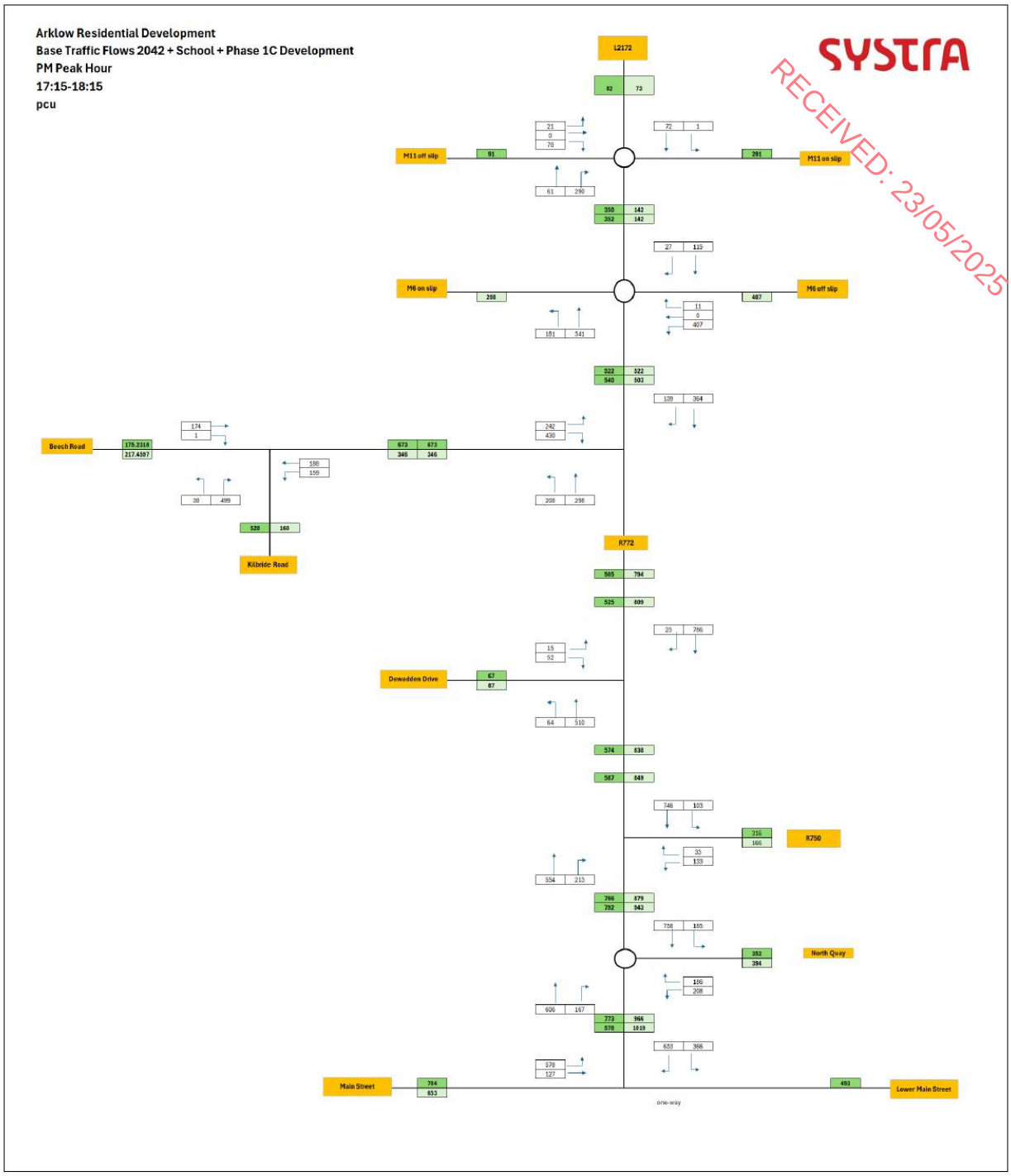

Arklow Residential Development
Base Traffic Flows 2027 + Construction Traffic + Phase 1A Development
PM Peak Hour
17:15-18:15
pcu
SYSTRA
RECEIVED: 23/05/2025
L2172
M11 off slip
M11 on slip
M6 on slip
M6 off slip
Beech Road
Kilbride Road
R772
Dewadden Drive
R750
North Quay
Main Street
Lower Main Street
one-way


Arklow Residential Development
Base Traffic Flows 2027 + Construction Traffic + Phase 1A Development
PM Peak Hour
17:15-18:15
pcu
SYSTRA
RECEIVED: 23/05/2025
L2172
M11 off slip
M11 on slip
M6 on slip
M6 off slip
Beech Road
Kilbride Road
R772
Dewadden Drive
R750
North Quay
Main Street
Lower Main Street
one-way


Arklow Residential Development
Base Traffic Flows 2032 + School + Construction Traffic + Phase 1B Development
AM Peak Hour
08:15-09:15
pcu
SYSTRA
RECEIVED: 23/05/2025
L2172
M11 off slip
M11 on slip
M6 on slip
M6 off slip
Beech Road
Kilbride Road
R772
Dewadden Drive
R750
North Quay
Main Street
Lower Main Street
one-way


Arklow Residential Development
Base Traffic Flows 2032 + School + Construction Traffic + Phase 1B Development
PM Peak Hour
17:15-18:15
pcu
SYSTRA
RECEIVED: 23/05/2025
L2172
M11 off slip
M11 on slip
M6 on slip
M6 off slip
Beech Road
Kilbride Road
R772
Dewadden Drive
R750
North Quay
Main Street
Lower Main Street
one-way


Arklow Residential Development
Base Traffic Flows 2042 + School + Phase 1C Development
AM Peak Hour
08:15-09:15
pcu
SYSTRA
RECEIVED: 23/05/2025
L2172
M11 off slip
M11 on slip
M6 on slip
M6 off slip
Beech Road
Kilbride Road
R772
Dewadden Drive
R750
North Quay
Main Street
Lower Main Street
one-way


Arklow Residential Development
Base Traffic Flows 2042 + School + Phase 1C Development
PM Peak Hour
17:15-18:15
pcu
SYSTRA
RECEIVED: 23/05/2025
L2172
M11 off slip
M11 on slip
M6 on slip
M6 off slip
Beech Road
Kilbride Road
R772
Dewadden Drive
R750
North Quay
Main Street
Lower Main Street
one-way

Appendix B – Site Plan


RECEIVED: 29/05/2025
MARSH / FLOOD ZONE

Appendix C – TRICS Reports

SYSTRA Ltd 37 Manor Place Edinburgh Licence No: 700705

Calculation Reference: AUDIT-700705-240626-0642

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
Category : C - FLATS PRIVATELY OWNED
MULTI-MODAL TOTAL VEHICLES

Selected regions and areas:

04	EAST ANGLIA		
	CA	CAMBRIDGESHIRE	1 days
	NF	NORFOLK	1 days
05	EAST MIDLANDS		
	DY	DERBY	1 days
	NG	NOTTINGHAM	2 days
06	WEST MIDLANDS		
	SH	SHROPSHIRE	2 days
08	NORTH WEST		
	MS	MERSEYSIDE	2 days
09	NORTH		
	TW	TYNE & WEAR	1 days
14	LEINSTER		
	LU	LOUTH	1 days
15	GREATER DUBLIN		
	DL	DUBLIN	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:	9 to 184 (units:)
Range Selected by User:	8 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: 01/01/16 to 19/06/23

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	3 days
Tuesday	3 days
Wednesday	4 days
Friday	2 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	12 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:

Suburban Area (PPS6 Out of Centre)	10
Edge of Town	1
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:

Development Zone	2
Residential Zone	7
No Sub Category	3

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.

Inclusion of Servicing Vehicles Counts:

Servicing vehicles Included	7 days - Selected
Servicing vehicles Excluded	5 days - Selected

Secondary Filtering selection:

Use Class:

C3	12 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order (England) 2020 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:

1,001 to 5,000	2 days
5,001 to 10,000	1 days
20,001 to 25,000	6 days
25,001 to 50,000	3 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

50,001 to 75,000	1 days
75,001 to 100,000	2 days
125,001 to 250,000	3 days
250,001 to 500,000	3 days
500,001 or More	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	7 days
1.1 to 1.5	5 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	12 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	12 days

This data displays the number of selected surveys with PTAL Ratings.

Covid-19 Restrictions	Yes	At least one survey within the selected data set was undertaken at a time of Covid-19 restrictions

LIST OF SITES relevant to selection parameters

1 CA-03-C-03 BLOCKS OF FLATS CAMBRIDGESHIRE
CROMWELL ROAD
CAMBRIDGE

Suburban Area (PPS6 Out of Centre)
No Sub Category
Total No of Dwellings: 82
Survey date: MONDAY *18/09/17* *Survey Type: MANUAL*

2 DL-03-C-18 BLOCKS OF FLATS DUBLIN
HAROLD'S CROSS ROAD
DUBLIN

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 102
Survey date: WEDNESDAY *19/05/21* *Survey Type: MANUAL*

3 DY-03-C-03 BLOCKS OF FLATS DERBY
CAESAR STREET
DERBY

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 30
Survey date: WEDNESDAY *25/09/19* *Survey Type: MANUAL*

4 LU-03-C-04 BLOCKS OF FLATS LOUTH
RIVER COURT
DROGHEDA

Neighbourhood Centre (PPS6 Local Centre)
Residential Zone
Total No of Dwellings: 42
Survey date: WEDNESDAY *22/09/21* *Survey Type: MANUAL*

5 MS-03-C-02 BLOCKS OF FLATS MERSEYSIDE
SOUTH FERRY QUAY
LIVERPOOL
BRUNSWICK DOCK
Suburban Area (PPS6 Out of Centre)
Development Zone
Total No of Dwellings: 184
Survey date: TUESDAY *13/11/18* *Survey Type: MANUAL*

6 MS-03-C-03 BLOCK OF FLATS MERSEYSIDE
MARINERS WHARF
LIVERPOOL
QUEENS DOCK
Suburban Area (PPS6 Out of Centre)
Development Zone
Total No of Dwellings: 9
Survey date: TUESDAY *13/11/18* *Survey Type: MANUAL*

7 NF-03-C-02 MIXED FLATS & HOUSES NORFOLK
HALL ROAD
NORWICH
LAKENHAM
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 82
Survey date: MONDAY *18/11/19* *Survey Type: MANUAL*

8 NG-03-C-01 HOUSES (SPLIT INTO FLATS) NOTTINGHAM
LAWRENCE WAY
NOTTINGHAM

Suburban Area (PPS6 Out of Centre)
No Sub Category
Total No of Dwellings: 56
Survey date: TUESDAY *08/11/16* *Survey Type: MANUAL*

LIST OF SITES relevant to selection parameters (Cont.)

9 NG-03-C-02 HOUSES (SPLIT INTO FLATS) NOTTINGHAM
CASTLE MARINA ROAD
NOTTINGHAM

Suburban Area (PPS6 Out of Centre)
No Sub Category
Total No of Dwellings: 135
Survey date: WEDNESDAY *09/11/16* *Survey Type: MANUAL*

10 SH-03-C-01 BLOCK OF FLATS SHROPSHIRE
ABBEY FOREGATE
SHREWSBURY

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 47
Survey date: MONDAY *19/06/23* *Survey Type: MANUAL*

11 SH-03-C-02 BLOCK OF FLATS SHROPSHIRE
ABBEY FOREGATE
SHREWSBURY

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 12
Survey date: FRIDAY *16/06/23* *Survey Type: MANUAL*

12 TW-03-C-01 BLOCKS OF FLATS TYNE & WEAR
CAULDWELL AVENUE
WHITLEY BAY
MONKESEATON
Edge of Town
Residential Zone
Total No of Dwellings: 45
Survey date: FRIDAY *15/10/21* *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.

SYSTRA Ltd 37 Manor Place Edinburgh Licence No: 700705

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
Total People to Total Vehicles ratio (all time periods and directions): 2.32

	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	12	69	0.045	12	69	0.145	12	69	0.190
08:00 - 09:00	12	69	0.052	12	69	0.165	12	69	0.217
09:00 - 10:00	12	69	0.084	12	69	0.102	12	69	0.186
10:00 - 11:00	12	69	0.075	12	69	0.093	12	69	0.168
11:00 - 12:00	12	69	0.058	12	69	0.074	12	69	0.132
12:00 - 13:00	12	69	0.070	12	69	0.077	12	69	0.147
13:00 - 14:00	12	69	0.056	12	69	0.079	12	69	0.135
14:00 - 15:00	12	69	0.069	12	69	0.073	12	69	0.142
15:00 - 16:00	12	69	0.105	12	69	0.063	12	69	0.168
16:00 - 17:00	12	69	0.114	12	69	0.069	12	69	0.183
17:00 - 18:00	12	69	0.153	12	69	0.070	12	69	0.223
18:00 - 19:00	12	69	0.119	12	69	0.073	12	69	0.192
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.000			1.083			2.083

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:	9 - 184 (units:)
Survey date date range:	01/01/16 - 19/06/23
Number of weekdays (Monday-Friday):	12
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.

SYSTRA Ltd 37 Manor Place Edinburgh Licence No: 700705

TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED
MULTI-MODAL TAXIS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	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	12	69	0.006	12	69	0.006	12	69	0.012
08:00 - 09:00	12	69	0.002	12	69	0.002	12	69	0.004
09:00 - 10:00	12	69	0.008	12	69	0.006	12	69	0.014
10:00 - 11:00	12	69	0.002	12	69	0.005	12	69	0.007
11:00 - 12:00	12	69	0.005	12	69	0.004	12	69	0.009
12:00 - 13:00	12	69	0.004	12	69	0.002	12	69	0.006
13:00 - 14:00	12	69	0.002	12	69	0.004	12	69	0.006
14:00 - 15:00	12	69	0.004	12	69	0.004	12	69	0.008
15:00 - 16:00	12	69	0.004	12	69	0.004	12	69	0.008
16:00 - 17:00	12	69	0.006	12	69	0.006	12	69	0.012
17:00 - 18:00	12	69	0.001	12	69	0.001	12	69	0.002
18:00 - 19:00	12	69	0.008	12	69	0.008	12	69	0.016
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.052			0.052			0.104

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.*

SYSTRA Ltd 37 Manor Place Edinburgh Licence No: 700705

TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED
MULTI-MODAL OGVS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	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	12	69	0.000	12	69	0.000	12	69	0.000
08:00 - 09:00	12	69	0.000	12	69	0.000	12	69	0.000
09:00 - 10:00	12	69	0.002	12	69	0.001	12	69	0.003
10:00 - 11:00	12	69	0.004	12	69	0.004	12	69	0.008
11:00 - 12:00	12	69	0.001	12	69	0.002	12	69	0.003
12:00 - 13:00	12	69	0.002	12	69	0.002	12	69	0.004
13:00 - 14:00	12	69	0.000	12	69	0.000	12	69	0.000
14:00 - 15:00	12	69	0.000	12	69	0.000	12	69	0.000
15:00 - 16:00	12	69	0.000	12	69	0.000	12	69	0.000
16:00 - 17:00	12	69	0.001	12	69	0.000	12	69	0.001
17:00 - 18:00	12	69	0.000	12	69	0.001	12	69	0.001
18:00 - 19:00	12	69	0.000	12	69	0.000	12	69	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.010			0.010			0.020

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.*

SYSTRA Ltd 37 Manor Place Edinburgh Licence No: 700705

TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED
MULTI-MODAL CYCLISTS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	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	12	69	0.001	12	69	0.011	12	69	0.012
08:00 - 09:00	12	69	0.002	12	69	0.022	12	69	0.024
09:00 - 10:00	12	69	0.002	12	69	0.002	12	69	0.004
10:00 - 11:00	12	69	0.002	12	69	0.002	12	69	0.004
11:00 - 12:00	12	69	0.005	12	69	0.001	12	69	0.006
12:00 - 13:00	12	69	0.001	12	69	0.001	12	69	0.002
13:00 - 14:00	12	69	0.002	12	69	0.004	12	69	0.006
14:00 - 15:00	12	69	0.008	12	69	0.005	12	69	0.013
15:00 - 16:00	12	69	0.006	12	69	0.002	12	69	0.008
16:00 - 17:00	12	69	0.006	12	69	0.001	12	69	0.007
17:00 - 18:00	12	69	0.011	12	69	0.007	12	69	0.018
18:00 - 19:00	12	69	0.007	12	69	0.006	12	69	0.013
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.053			0.064			0.117

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

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	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	12	69	0.045	12	69	0.179	12	69	0.224
08:00 - 09:00	12	69	0.058	12	69	0.240	12	69	0.298
09:00 - 10:00	12	69	0.107	12	69	0.132	12	69	0.239
10:00 - 11:00	12	69	0.097	12	69	0.119	12	69	0.216
11:00 - 12:00	12	69	0.073	12	69	0.111	12	69	0.184
12:00 - 13:00	12	69	0.098	12	69	0.097	12	69	0.195
13:00 - 14:00	12	69	0.068	12	69	0.094	12	69	0.162
14:00 - 15:00	12	69	0.088	12	69	0.092	12	69	0.180
15:00 - 16:00	12	69	0.145	12	69	0.080	12	69	0.225
16:00 - 17:00	12	69	0.155	12	69	0.079	12	69	0.234
17:00 - 18:00	12	69	0.197	12	69	0.090	12	69	0.287
18:00 - 19:00	12	69	0.150	12	69	0.099	12	69	0.249
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.281			1.412			2.693

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

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	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	12	69	0.015	12	69	0.086	12	69	0.101
08:00 - 09:00	12	69	0.033	12	69	0.142	12	69	0.175
09:00 - 10:00	12	69	0.050	12	69	0.098	12	69	0.148
10:00 - 11:00	12	69	0.050	12	69	0.063	12	69	0.113
11:00 - 12:00	12	69	0.035	12	69	0.059	12	69	0.094
12:00 - 13:00	12	69	0.068	12	69	0.064	12	69	0.132
13:00 - 14:00	12	69	0.063	12	69	0.062	12	69	0.125
14:00 - 15:00	12	69	0.069	12	69	0.062	12	69	0.131
15:00 - 16:00	12	69	0.086	12	69	0.052	12	69	0.138
16:00 - 17:00	12	69	0.085	12	69	0.046	12	69	0.131
17:00 - 18:00	12	69	0.109	12	69	0.059	12	69	0.168
18:00 - 19:00	12	69	0.092	12	69	0.056	12	69	0.148
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.755			0.849			1.604

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

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	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	12	69	0.000	12	69	0.022	12	69	0.022
08:00 - 09:00	12	69	0.000	12	69	0.029	12	69	0.029
09:00 - 10:00	12	69	0.006	12	69	0.019	12	69	0.025
10:00 - 11:00	12	69	0.006	12	69	0.017	12	69	0.023
11:00 - 12:00	12	69	0.006	12	69	0.017	12	69	0.023
12:00 - 13:00	12	69	0.010	12	69	0.012	12	69	0.022
13:00 - 14:00	12	69	0.011	12	69	0.011	12	69	0.022
14:00 - 15:00	12	69	0.015	12	69	0.017	12	69	0.032
15:00 - 16:00	12	69	0.019	12	69	0.002	12	69	0.021
16:00 - 17:00	12	69	0.022	12	69	0.004	12	69	0.026
17:00 - 18:00	12	69	0.030	12	69	0.004	12	69	0.034
18:00 - 19:00	12	69	0.015	12	69	0.004	12	69	0.019
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.140			0.158			0.298

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

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	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	12	69	0.000	12	69	0.017	12	69	0.017
08:00 - 09:00	12	69	0.000	12	69	0.029	12	69	0.029
09:00 - 10:00	12	69	0.001	12	69	0.007	12	69	0.008
10:00 - 11:00	12	69	0.000	12	69	0.002	12	69	0.002
11:00 - 12:00	12	69	0.000	12	69	0.006	12	69	0.006
12:00 - 13:00	12	69	0.000	12	69	0.000	12	69	0.000
13:00 - 14:00	12	69	0.002	12	69	0.001	12	69	0.003
14:00 - 15:00	12	69	0.000	12	69	0.000	12	69	0.000
15:00 - 16:00	12	69	0.002	12	69	0.002	12	69	0.004
16:00 - 17:00	12	69	0.004	12	69	0.001	12	69	0.005
17:00 - 18:00	12	69	0.012	12	69	0.000	12	69	0.012
18:00 - 19:00	12	69	0.028	12	69	0.001	12	69	0.029
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.049			0.066			0.115

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

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	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	12	69	0.000	12	69	0.000	12	69	0.000
08:00 - 09:00	12	69	0.000	12	69	0.001	12	69	0.001
09:00 - 10:00	12	69	0.000	12	69	0.000	12	69	0.000
10:00 - 11:00	12	69	0.000	12	69	0.000	12	69	0.000
11:00 - 12:00	12	69	0.000	12	69	0.000	12	69	0.000
12:00 - 13:00	12	69	0.000	12	69	0.000	12	69	0.000
13:00 - 14:00	12	69	0.000	12	69	0.000	12	69	0.000
14:00 - 15:00	12	69	0.000	12	69	0.000	12	69	0.000
15:00 - 16:00	12	69	0.000	12	69	0.000	12	69	0.000
16:00 - 17:00	12	69	0.000	12	69	0.000	12	69	0.000
17:00 - 18:00	12	69	0.000	12	69	0.000	12	69	0.000
18:00 - 19:00	12	69	0.000	12	69	0.000	12	69	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.000			0.001			0.001

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

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	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	12	69	0.000	12	69	0.039	12	69	0.039
08:00 - 09:00	12	69	0.000	12	69	0.059	12	69	0.059
09:00 - 10:00	12	69	0.007	12	69	0.027	12	69	0.034
10:00 - 11:00	12	69	0.006	12	69	0.019	12	69	0.025
11:00 - 12:00	12	69	0.006	12	69	0.023	12	69	0.029
12:00 - 13:00	12	69	0.010	12	69	0.012	12	69	0.022
13:00 - 14:00	12	69	0.013	12	69	0.012	12	69	0.025
14:00 - 15:00	12	69	0.015	12	69	0.017	12	69	0.032
15:00 - 16:00	12	69	0.022	12	69	0.005	12	69	0.027
16:00 - 17:00	12	69	0.025	12	69	0.005	12	69	0.030
17:00 - 18:00	12	69	0.042	12	69	0.004	12	69	0.046
18:00 - 19:00	12	69	0.042	12	69	0.005	12	69	0.047
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.188			0.227			0.415

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
Total People to Total Vehicles ratio (all time periods and directions): 2.32

	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	12	69	0.061	12	69	0.315	12	69	0.376
08:00 - 09:00	12	69	0.093	12	69	0.462	12	69	0.555
09:00 - 10:00	12	69	0.166	12	69	0.259	12	69	0.425
10:00 - 11:00	12	69	0.155	12	69	0.203	12	69	0.358
11:00 - 12:00	12	69	0.119	12	69	0.195	12	69	0.314
12:00 - 13:00	12	69	0.177	12	69	0.174	12	69	0.351
13:00 - 14:00	12	69	0.146	12	69	0.172	12	69	0.318
14:00 - 15:00	12	69	0.180	12	69	0.176	12	69	0.356
15:00 - 16:00	12	69	0.259	12	69	0.139	12	69	0.398
16:00 - 17:00	12	69	0.271	12	69	0.131	12	69	0.402
17:00 - 18:00	12	69	0.360	12	69	0.160	12	69	0.520
18:00 - 19:00	12	69	0.292	12	69	0.166	12	69	0.458
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			2.279			2.552			4.831

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

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	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	12	69	0.038	12	69	0.133	12	69	0.171
08:00 - 09:00	12	69	0.039	12	69	0.150	12	69	0.189
09:00 - 10:00	12	69	0.062	12	69	0.086	12	69	0.148
10:00 - 11:00	12	69	0.050	12	69	0.069	12	69	0.119
11:00 - 12:00	12	69	0.047	12	69	0.062	12	69	0.109
12:00 - 13:00	12	69	0.053	12	69	0.067	12	69	0.120
13:00 - 14:00	12	69	0.047	12	69	0.064	12	69	0.111
14:00 - 15:00	12	69	0.058	12	69	0.063	12	69	0.121
15:00 - 16:00	12	69	0.090	12	69	0.048	12	69	0.138
16:00 - 17:00	12	69	0.102	12	69	0.054	12	69	0.156
17:00 - 18:00	12	69	0.145	12	69	0.061	12	69	0.206
18:00 - 19:00	12	69	0.102	12	69	0.058	12	69	0.160
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.833			0.915			1.748

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

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	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	12	69	0.001	12	69	0.005	12	69	0.006
08:00 - 09:00	12	69	0.011	12	69	0.010	12	69	0.021
09:00 - 10:00	12	69	0.011	12	69	0.008	12	69	0.019
10:00 - 11:00	12	69	0.019	12	69	0.016	12	69	0.035
11:00 - 12:00	12	69	0.005	12	69	0.006	12	69	0.011
12:00 - 13:00	12	69	0.011	12	69	0.006	12	69	0.017
13:00 - 14:00	12	69	0.006	12	69	0.011	12	69	0.017
14:00 - 15:00	12	69	0.006	12	69	0.006	12	69	0.012
15:00 - 16:00	12	69	0.012	12	69	0.011	12	69	0.023
16:00 - 17:00	12	69	0.005	12	69	0.008	12	69	0.013
17:00 - 18:00	12	69	0.004	12	69	0.004	12	69	0.008
18:00 - 19:00	12	69	0.006	12	69	0.004	12	69	0.010
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.097			0.095			0.192

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 MOTOR CYCLES
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	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	12	69	0.000	12	69	0.001	12	69	0.001
08:00 - 09:00	12	69	0.000	12	69	0.002	12	69	0.002
09:00 - 10:00	12	69	0.000	12	69	0.000	12	69	0.000
10:00 - 11:00	12	69	0.000	12	69	0.000	12	69	0.000
11:00 - 12:00	12	69	0.000	12	69	0.000	12	69	0.000
12:00 - 13:00	12	69	0.000	12	69	0.000	12	69	0.000
13:00 - 14:00	12	69	0.000	12	69	0.000	12	69	0.000
14:00 - 15:00	12	69	0.001	12	69	0.000	12	69	0.001
15:00 - 16:00	12	69	0.000	12	69	0.000	12	69	0.000
16:00 - 17:00	12	69	0.000	12	69	0.000	12	69	0.000
17:00 - 18:00	12	69	0.002	12	69	0.004	12	69	0.006
18:00 - 19:00	12	69	0.002	12	69	0.002	12	69	0.004
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.005			0.009			0.014

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.*

SYSTRA Ltd 37 Manor Place Edinburgh Licence No: 700705

Calculation Reference: AUDIT-700705-240626-0616

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		
	HC	HAMPSHIRE	1 days
	KC	KENT	3 days
	SC	SURREY	1 days
	SP	SOUTHAMPTON	1 days
	WS	WEST SUSSEX	2 days
04	EAST ANGLIA		
	NF	NORFOLK	7 days
05	EAST MIDLANDS		
	DY	DERBY	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:	250 to 1146 (units:)
Range Selected by User:	250 to 1500 (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: 01/01/16 to 09/11/23

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	4 days
Thursday	4 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	16 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:

Suburban Area (PPS6 Out of Centre)	1
Edge of Town	14
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	11
Village	1
Out of Town	3
No Sub Category	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.

Inclusion of Servicing Vehicles Counts:

Servicing vehicles Included	7 days - Selected
Servicing vehicles Excluded	11 days - Selected

Secondary Filtering selection:

Use Class:

C3	16 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order (England) 2020 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:

1,001 to 5,000	1 days
5,001 to 10,000	7 days
10,001 to 15,000	3 days
15,001 to 20,000	3 days
20,001 to 25,000	1 days
25,001 to 50,000	1 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

5,001 to 25,000	2 days
25,001 to 50,000	2 days
50,001 to 75,000	2 days
75,001 to 100,000	3 days
125,001 to 250,000	5 days
250,001 to 500,000	2 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	5 days
1.1 to 1.5	10 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	13 days
No	3 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	16 days

This data displays the number of selected surveys with PTAL Ratings.

Covid-19 Restrictions	Yes	At least one survey within the selected data set was undertaken at a time of Covid-19 restrictions

LIST OF SITES relevant to selection parameters

1 DY-03-A-01 MIXED HOUSES DERBY
RADBOURNE LANE
DERBY

Edge of Town
Residential Zone
Total No of Dwellings: 371
Survey date: TUESDAY 10/07/18 Survey Type: MANUAL

2 HC-03-A-26 MIXED HOUSES & FLATS HAMPSHIRE
BOTLEY ROAD
WHITELEY

Edge of Town
Out of Town
Total No of Dwellings: 270
Survey date: THURSDAY 24/06/21 Survey Type: MANUAL

3 KC-03-A-06 MIXED HOUSES & FLATS KENT
MARGATE ROAD
HERNE BAY

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 363
Survey date: WEDNESDAY 27/09/17 Survey Type: MANUAL

4 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

5 KC-03-A-11 MIXED HOUSES & FLATS KENT
COLDHARBOUR ROAD
GRAVESEND

Edge of Town
No Sub Category
Total No of Dwellings: 375
Survey date: MONDAY 20/03/23 Survey Type: MANUAL

6 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

7 NF-03-A-09 MIXED HOUSES & FLATS NORFOLK
ROUND HOUSE WAY
NORWICH
CRINGLEFORD
Edge of Town
Residential Zone
Total No of Dwellings: 984
Survey date: TUESDAY 24/09/19 Survey Type: MANUAL

LIST OF SITES relevant to selection parameters (Cont.)

8 NF-03-A-23 MIXED HOUSES & FLATS NORFOLK
SILFIELD ROAD
WYMONDHAM

Edge of Town
Out of Town
Total No of Dwellings: 514
Survey date: WEDNESDAY *22/09/21* *Survey Type: MANUAL*

9 NF-03-A-28 MIXED HOUSES & FLATS NORFOLK
ATLANTIC AVENUE
NORWICH
SPROWSTON
Edge of Town
Residential Zone
Total No of Dwellings: 1146
Survey date: THURSDAY *22/09/22* *Survey Type: MANUAL*

10 NF-03-A-30 MIXED HOUSES NORFOLK
BRANDON ROAD
SWAFFHAM

Edge of Town
Residential Zone
Total No of Dwellings: 266
Survey date: THURSDAY *23/09/21* *Survey Type: MANUAL*

11 NF-03-A-38 MIXED HOUSES NORFOLK
BEAUFORT WAY
GREAT YARMOUTH
BRADWELL
Edge of Town
Residential Zone
Total No of Dwellings: 537
Survey date: TUESDAY *20/09/22* *Survey Type: MANUAL*

12 NF-03-A-46 MIXED HOUSES & FLATS NORFOLK
BURGH ROAD
AYLSHAM

Edge of Town
Residential Zone
Total No of Dwellings: 300
Survey date: TUESDAY *14/09/21* *Survey Type: MANUAL*

13 SC-03-A-08 MIXED HOUSES SURREY
REIGATE ROAD
HORLEY

Edge of Town
Residential Zone
Total No of Dwellings: 790
Survey date: WEDNESDAY *04/05/22* *Survey Type: MANUAL*

14 SP-03-A-02 MIXED HOUSES & FLATS SOUTHAMPTON
BARNFIELD WAY
NEAR SOUTHAMPTON
HEDGE END
Edge of Town
Out of Town
Total No of Dwellings: 250
Survey date: TUESDAY *12/10/21* *Survey Type: MANUAL*

LIST OF SITES relevant to selection parameters (Cont.)

15 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*

16 WS-03-A-21 MIXED HOUSES WEST SUSSEX
HILLAND ROAD
BILLINGSHURST

Neighbourhood Centre (PPS6 Local Centre)
Village
Total No of Dwellings: 480
Survey date: THURSDAY *09/11/23* *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
Total People to Total Vehicles ratio (all time periods and directions): 1.68

	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	16	508	0.074	16	508	0.297	16	508	0.371
08:00 - 09:00	16	508	0.151	16	508	0.373	16	508	0.524
09:00 - 10:00	16	508	0.133	16	508	0.154	16	508	0.287
10:00 - 11:00	16	508	0.106	16	508	0.125	16	508	0.231
11:00 - 12:00	16	508	0.112	16	508	0.123	16	508	0.235
12:00 - 13:00	16	508	0.138	16	508	0.134	16	508	0.272
13:00 - 14:00	16	508	0.138	16	508	0.126	16	508	0.264
14:00 - 15:00	16	508	0.140	16	508	0.154	16	508	0.294
15:00 - 16:00	16	508	0.231	16	508	0.152	16	508	0.383
16:00 - 17:00	16	508	0.262	16	508	0.152	16	508	0.414
17:00 - 18:00	16	508	0.346	16	508	0.159	16	508	0.505
18:00 - 19:00	16	508	0.283	16	508	0.147	16	508	0.430
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			2.114			2.096			4.210

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:	250 - 1146 (units:)
Survey date date range:	01/01/16 - 09/11/23
Number of weekdays (Monday-Friday):	16
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.

SYSTRA Ltd 37 Manor Place Edinburgh Licence No: 700705

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
MULTI-MODAL TAXIS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	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	16	508	0.002	16	508	0.002	16	508	0.004
08:00 - 09:00	16	508	0.005	16	508	0.005	16	508	0.010
09:00 - 10:00	16	508	0.002	16	508	0.002	16	508	0.004
10:00 - 11:00	16	508	0.001	16	508	0.001	16	508	0.002
11:00 - 12:00	16	508	0.001	16	508	0.001	16	508	0.002
12:00 - 13:00	16	508	0.001	16	508	0.001	16	508	0.002
13:00 - 14:00	16	508	0.002	16	508	0.001	16	508	0.003
14:00 - 15:00	16	508	0.002	16	508	0.001	16	508	0.003
15:00 - 16:00	16	508	0.004	16	508	0.004	16	508	0.008
16:00 - 17:00	16	508	0.002	16	508	0.003	16	508	0.005
17:00 - 18:00	16	508	0.002	16	508	0.003	16	508	0.005
18:00 - 19:00	16	508	0.001	16	508	0.001	16	508	0.002
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.025			0.025			0.050

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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TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
MULTI-MODAL OGVS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	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	16	508	0.000	16	508	0.001	16	508	0.001
08:00 - 09:00	16	508	0.002	16	508	0.002	16	508	0.004
09:00 - 10:00	16	508	0.002	16	508	0.002	16	508	0.004
10:00 - 11:00	16	508	0.001	16	508	0.001	16	508	0.002
11:00 - 12:00	16	508	0.002	16	508	0.002	16	508	0.004
12:00 - 13:00	16	508	0.001	16	508	0.002	16	508	0.003
13:00 - 14:00	16	508	0.002	16	508	0.002	16	508	0.004
14:00 - 15:00	16	508	0.002	16	508	0.001	16	508	0.003
15:00 - 16:00	16	508	0.001	16	508	0.001	16	508	0.002
16:00 - 17:00	16	508	0.001	16	508	0.001	16	508	0.002
17:00 - 18:00	16	508	0.001	16	508	0.001	16	508	0.002
18:00 - 19:00	16	508	0.000	16	508	0.000	16	508	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.015			0.016			0.031

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 PSVS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	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	16	508	0.000	16	508	0.000	16	508	0.000
08:00 - 09:00	16	508	0.001	16	508	0.000	16	508	0.001
09:00 - 10:00	16	508	0.000	16	508	0.000	16	508	0.000
10:00 - 11:00	16	508	0.000	16	508	0.000	16	508	0.000
11:00 - 12:00	16	508	0.000	16	508	0.000	16	508	0.000
12:00 - 13:00	16	508	0.000	16	508	0.000	16	508	0.000
13:00 - 14:00	16	508	0.000	16	508	0.000	16	508	0.000
14:00 - 15:00	16	508	0.000	16	508	0.000	16	508	0.000
15:00 - 16:00	16	508	0.000	16	508	0.000	16	508	0.000
16:00 - 17:00	16	508	0.000	16	508	0.000	16	508	0.000
17:00 - 18:00	16	508	0.000	16	508	0.000	16	508	0.000
18:00 - 19:00	16	508	0.000	16	508	0.000	16	508	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.001			0.000			0.001

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 CYCLISTS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	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	16	508	0.003	16	508	0.007	16	508	0.010
08:00 - 09:00	16	508	0.004	16	508	0.014	16	508	0.018
09:00 - 10:00	16	508	0.002	16	508	0.003	16	508	0.005
10:00 - 11:00	16	508	0.002	16	508	0.002	16	508	0.004
11:00 - 12:00	16	508	0.001	16	508	0.002	16	508	0.003
12:00 - 13:00	16	508	0.002	16	508	0.002	16	508	0.004
13:00 - 14:00	16	508	0.003	16	508	0.001	16	508	0.004
14:00 - 15:00	16	508	0.003	16	508	0.003	16	508	0.006
15:00 - 16:00	16	508	0.008	16	508	0.002	16	508	0.010
16:00 - 17:00	16	508	0.010	16	508	0.005	16	508	0.015
17:00 - 18:00	16	508	0.008	16	508	0.005	16	508	0.013
18:00 - 19:00	16	508	0.005	16	508	0.004	16	508	0.009
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.051			0.050			0.101

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 VEHICLE OCCUPANTS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	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	16	508	0.090	16	508	0.412	16	508	0.502
08:00 - 09:00	16	508	0.188	16	508	0.624	16	508	0.812
09:00 - 10:00	16	508	0.170	16	508	0.215	16	508	0.385
10:00 - 11:00	16	508	0.141	16	508	0.174	16	508	0.315
11:00 - 12:00	16	508	0.152	16	508	0.171	16	508	0.323
12:00 - 13:00	16	508	0.184	16	508	0.182	16	508	0.366
13:00 - 14:00	16	508	0.187	16	508	0.166	16	508	0.353
14:00 - 15:00	16	508	0.194	16	508	0.206	16	508	0.400
15:00 - 16:00	16	508	0.406	16	508	0.217	16	508	0.623
16:00 - 17:00	16	508	0.418	16	508	0.217	16	508	0.635
17:00 - 18:00	16	508	0.503	16	508	0.227	16	508	0.730
18:00 - 19:00	16	508	0.410	16	508	0.223	16	508	0.633
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			3.043			3.034			6.077

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 PEDESTRIANS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	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	16	508	0.012	16	508	0.039	16	508	0.051
08:00 - 09:00	16	508	0.024	16	508	0.082	16	508	0.106
09:00 - 10:00	16	508	0.021	16	508	0.021	16	508	0.042
10:00 - 11:00	16	508	0.016	16	508	0.018	16	508	0.034
11:00 - 12:00	16	508	0.017	16	508	0.015	16	508	0.032
12:00 - 13:00	16	508	0.020	16	508	0.018	16	508	0.038
13:00 - 14:00	16	508	0.021	16	508	0.018	16	508	0.039
14:00 - 15:00	16	508	0.027	16	508	0.029	16	508	0.056
15:00 - 16:00	16	508	0.068	16	508	0.030	16	508	0.098
16:00 - 17:00	16	508	0.038	16	508	0.021	16	508	0.059
17:00 - 18:00	16	508	0.038	16	508	0.032	16	508	0.070
18:00 - 19:00	16	508	0.034	16	508	0.030	16	508	0.064
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.336			0.353			0.689

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

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	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	16	508	0.001	16	508	0.019	16	508	0.020
08:00 - 09:00	16	508	0.001	16	508	0.021	16	508	0.022
09:00 - 10:00	16	508	0.003	16	508	0.008	16	508	0.011
10:00 - 11:00	16	508	0.003	16	508	0.007	16	508	0.010
11:00 - 12:00	16	508	0.004	16	508	0.007	16	508	0.011
12:00 - 13:00	16	508	0.004	16	508	0.004	16	508	0.008
13:00 - 14:00	16	508	0.004	16	508	0.004	16	508	0.008
14:00 - 15:00	16	508	0.006	16	508	0.004	16	508	0.010
15:00 - 16:00	16	508	0.015	16	508	0.004	16	508	0.019
16:00 - 17:00	16	508	0.019	16	508	0.003	16	508	0.022
17:00 - 18:00	16	508	0.014	16	508	0.003	16	508	0.017
18:00 - 19:00	16	508	0.010	16	508	0.003	16	508	0.013
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.084			0.087			0.171

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

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	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	16	508	0.000	16	508	0.006	16	508	0.006
08:00 - 09:00	16	508	0.000	16	508	0.006	16	508	0.006
09:00 - 10:00	16	508	0.000	16	508	0.002	16	508	0.002
10:00 - 11:00	16	508	0.000	16	508	0.001	16	508	0.001
11:00 - 12:00	16	508	0.001	16	508	0.001	16	508	0.002
12:00 - 13:00	16	508	0.000	16	508	0.000	16	508	0.000
13:00 - 14:00	16	508	0.000	16	508	0.000	16	508	0.000
14:00 - 15:00	16	508	0.000	16	508	0.000	16	508	0.000
15:00 - 16:00	16	508	0.001	16	508	0.001	16	508	0.002
16:00 - 17:00	16	508	0.002	16	508	0.000	16	508	0.002
17:00 - 18:00	16	508	0.006	16	508	0.000	16	508	0.006
18:00 - 19:00	16	508	0.004	16	508	0.000	16	508	0.004
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.014			0.017			0.031

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

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	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	16	508	0.000	16	508	0.000	16	508	0.000
08:00 - 09:00	16	508	0.000	16	508	0.000	16	508	0.000
09:00 - 10:00	16	508	0.000	16	508	0.000	16	508	0.000
10:00 - 11:00	16	508	0.000	16	508	0.000	16	508	0.000
11:00 - 12:00	16	508	0.000	16	508	0.000	16	508	0.000
12:00 - 13:00	16	508	0.000	16	508	0.000	16	508	0.000
13:00 - 14:00	16	508	0.000	16	508	0.000	16	508	0.000
14:00 - 15:00	16	508	0.000	16	508	0.000	16	508	0.000
15:00 - 16:00	16	508	0.000	16	508	0.000	16	508	0.000
16:00 - 17:00	16	508	0.000	16	508	0.000	16	508	0.000
17:00 - 18:00	16	508	0.000	16	508	0.000	16	508	0.000
18:00 - 19:00	16	508	0.000	16	508	0.000	16	508	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.000			0.000			0.000

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

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	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	16	508	0.001	16	508	0.024	16	508	0.025
08:00 - 09:00	16	508	0.001	16	508	0.027	16	508	0.028
09:00 - 10:00	16	508	0.003	16	508	0.010	16	508	0.013
10:00 - 11:00	16	508	0.003	16	508	0.008	16	508	0.011
11:00 - 12:00	16	508	0.005	16	508	0.008	16	508	0.013
12:00 - 13:00	16	508	0.004	16	508	0.004	16	508	0.008
13:00 - 14:00	16	508	0.004	16	508	0.004	16	508	0.008
14:00 - 15:00	16	508	0.006	16	508	0.005	16	508	0.011
15:00 - 16:00	16	508	0.016	16	508	0.005	16	508	0.021
16:00 - 17:00	16	508	0.022	16	508	0.003	16	508	0.025
17:00 - 18:00	16	508	0.021	16	508	0.003	16	508	0.024
18:00 - 19:00	16	508	0.015	16	508	0.003	16	508	0.018
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.101			0.104			0.205

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
Total People to Total Vehicles ratio (all time periods and directions): 1.68

	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	16	508	0.106	16	508	0.482	16	508	0.588
08:00 - 09:00	16	508	0.217	16	508	0.747	16	508	0.964
09:00 - 10:00	16	508	0.196	16	508	0.248	16	508	0.444
10:00 - 11:00	16	508	0.162	16	508	0.201	16	508	0.363
11:00 - 12:00	16	508	0.175	16	508	0.197	16	508	0.372
12:00 - 13:00	16	508	0.210	16	508	0.206	16	508	0.416
13:00 - 14:00	16	508	0.215	16	508	0.189	16	508	0.404
14:00 - 15:00	16	508	0.230	16	508	0.243	16	508	0.473
15:00 - 16:00	16	508	0.498	16	508	0.254	16	508	0.752
16:00 - 17:00	16	508	0.487	16	508	0.246	16	508	0.733
17:00 - 18:00	16	508	0.570	16	508	0.267	16	508	0.837
18:00 - 19:00	16	508	0.463	16	508	0.260	16	508	0.723
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			3.529			3.540			7.069

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

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	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	16	508	0.061	16	508	0.265	16	508	0.326
08:00 - 09:00	16	508	0.129	16	508	0.339	16	508	0.468
09:00 - 10:00	16	508	0.113	16	508	0.133	16	508	0.246
10:00 - 11:00	16	508	0.089	16	508	0.107	16	508	0.196
11:00 - 12:00	16	508	0.095	16	508	0.105	16	508	0.200
12:00 - 13:00	16	508	0.121	16	508	0.116	16	508	0.237
13:00 - 14:00	16	508	0.119	16	508	0.106	16	508	0.225
14:00 - 15:00	16	508	0.123	16	508	0.138	16	508	0.261
15:00 - 16:00	16	508	0.208	16	508	0.131	16	508	0.339
16:00 - 17:00	16	508	0.233	16	508	0.135	16	508	0.368
17:00 - 18:00	16	508	0.314	16	508	0.142	16	508	0.456
18:00 - 19:00	16	508	0.261	16	508	0.134	16	508	0.395
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.866			1.851			3.717

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

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	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	16	508	0.009	16	508	0.027	16	508	0.036
08:00 - 09:00	16	508	0.014	16	508	0.024	16	508	0.038
09:00 - 10:00	16	508	0.015	16	508	0.017	16	508	0.032
10:00 - 11:00	16	508	0.014	16	508	0.015	16	508	0.029
11:00 - 12:00	16	508	0.014	16	508	0.015	16	508	0.029
12:00 - 13:00	16	508	0.013	16	508	0.014	16	508	0.027
13:00 - 14:00	16	508	0.014	16	508	0.016	16	508	0.030
14:00 - 15:00	16	508	0.012	16	508	0.012	16	508	0.024
15:00 - 16:00	16	508	0.015	16	508	0.014	16	508	0.029
16:00 - 17:00	16	508	0.023	16	508	0.012	16	508	0.035
17:00 - 18:00	16	508	0.026	16	508	0.011	16	508	0.037
18:00 - 19:00	16	508	0.017	16	508	0.009	16	508	0.026
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.186			0.186			0.372

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

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	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	16	508	0.001	16	508	0.002	16	508	0.003
08:00 - 09:00	16	508	0.000	16	508	0.004	16	508	0.004
09:00 - 10:00	16	508	0.000	16	508	0.000	16	508	0.000
10:00 - 11:00	16	508	0.001	16	508	0.001	16	508	0.002
11:00 - 12:00	16	508	0.000	16	508	0.001	16	508	0.001
12:00 - 13:00	16	508	0.001	16	508	0.001	16	508	0.002
13:00 - 14:00	16	508	0.001	16	508	0.001	16	508	0.002
14:00 - 15:00	16	508	0.001	16	508	0.001	16	508	0.002
15:00 - 16:00	16	508	0.002	16	508	0.002	16	508	0.004
16:00 - 17:00	16	508	0.002	16	508	0.001	16	508	0.003
17:00 - 18:00	16	508	0.003	16	508	0.001	16	508	0.004
18:00 - 19:00	16	508	0.003	16	508	0.001	16	508	0.004
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.015			0.016			0.031

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.*

Appendix D – Model Output Files

**Available electronically upon request*

Appendix E – R772 / Beech Road sensitivity test

8.2.6 The table below provides a comparison between the 55% car driver mode share presented in the main body of the TA, and a sensitivity test, which assumes that the car driver mode share from the development remains as per the Census 2022 results, i.e. at 70%. The Dublin Road/Beech Road junction has been evaluated with both mode share assumptions in place.

Arm	AM peak hour (0800-0900)			PM peak hour (1700-1800)		
	Queue (pcu)	Delay (s)	RFC	Queue (pcu)	Delay (s)	RFC
Base 2032 + School + Dev (500 units) 70% Mode Share						
R772 Dublin Rd (S)	14.5	23.3	59.10%	10.4	17.8	46.50%
Beech Road	15.5	40.6	75.2 : 75.2%	6.8	36.2	54.8 : 54.8%
R772 Dublin Rd (N)	17.3	41.9	76.50%	12.8	24.8	55.90%
Base 2032 + School + Dev (500 units) 55% Mode Share						
R772 Dublin Rd (S)	15.2	24.5	61.10%	10.9	24.7	49.10%
Beech Road	18.1	43.4	80.7 : 80.7%	12.5	31.6	66.2 : 66.2%
R772 Dublin Rd (N)	18.3	47.0	81.00%	14.2	33.7	64.20%
Base 2042 + School + Dev (500 units) 70% Mode Share						
R772 Dublin Rd (S)	16.0	25.7	63.20%	12.0	17.6	51.30%
Beech Road	19.6	44.6	83.0 : 83.0%	7.5	38.7	58.2 : 58.2%
R772 Dublin Rd (N)	19.5	51.6	84.60%	13.5	25.3	58.00%
Base 2042 + School + Dev (500 units) 55% Mode Share						
R772 Dublin Rd (S)	16.9	27.2	66.00%	12.7	27.4	55.50%
Beech Road	25.6	56.2	91.5 : 91.5%	16.6	33.8	74.8 : 74.8%
R772 Dublin Rd (N)	23.2	72.7	93.20%	15.6	39.2	71.80%

8.2.7 The results show that assuming the Census 2022 mode share remains in place:

- Junction performance slightly worsens in Phase 1B, but the junction is predicted to remain within capacity; and
- The junction is predicted to operate slightly over practical capacity in the AM peak hour in 2042 (Phase 1C).

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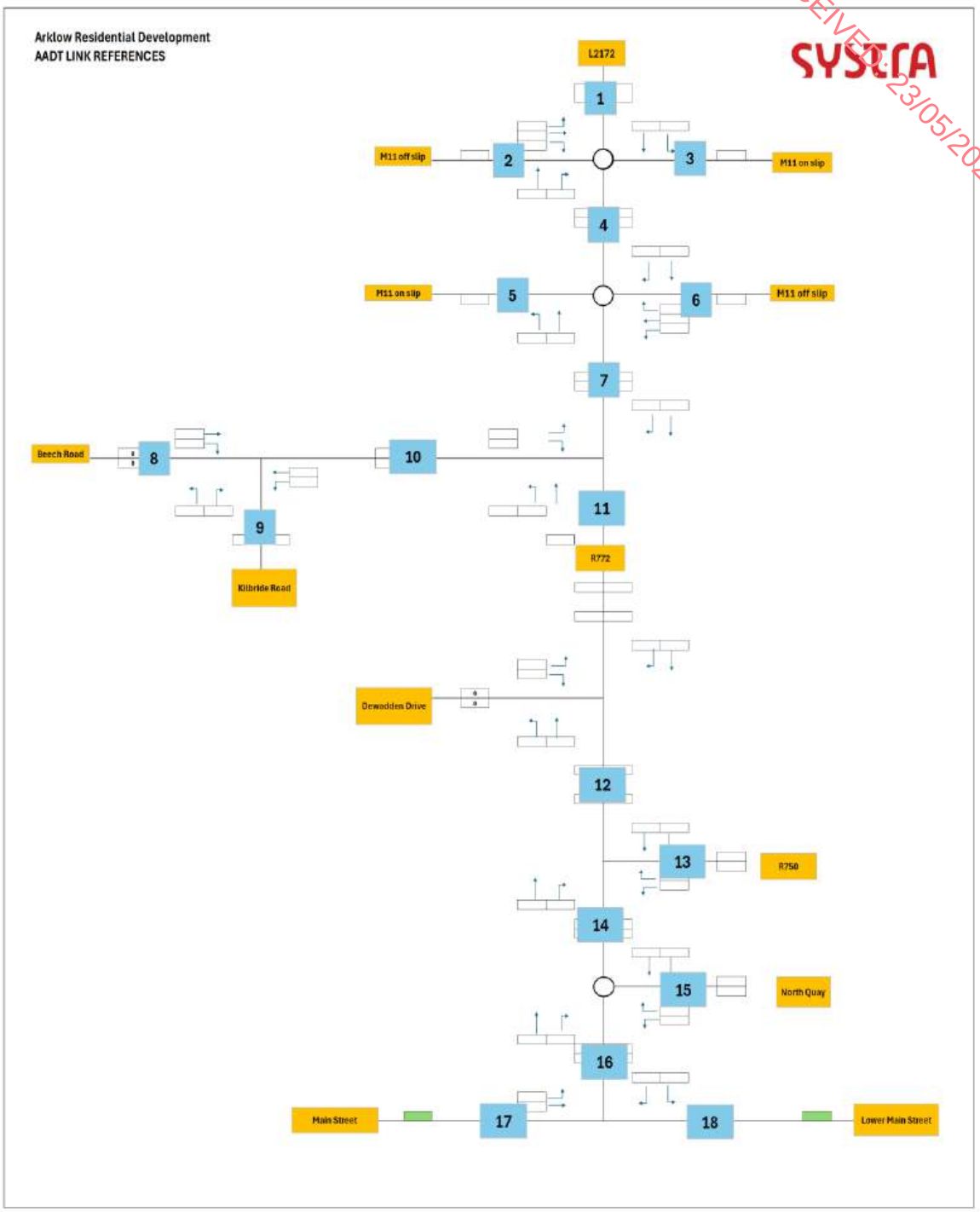
Appendix 11.2

AADT Information

Appendix 11.2 – AADT Information



Link No	Link Name	Two-way AADT								
		Base 2026	Base 2027	Base 2032	Base 2042	Construction Traffic	School Traffic	Phase 1 (113 units)	Phase 2 (500 units)	Phase 3 (750 units)
1	L2172 Redcross Road north of M11	1,698	1,724	1,817	1,891	0	29	22	96	145
2	M11 EB off-slip	1,655	1,680	1,771	1,843	35	0	16	72	109
3	M11 EB on-slip	3,512	3,565	3,760	3,911	35	0	81	357	536
4	L2172 between EB and WB slips	6,211	6,305	6,648	6,917	70	92	119	526	789
5	M11 WB on-slip	1,544	1,567	1,652	1,719	35	0	22	99	148
6	M1 WB off-slip	3,672	3,728	3,931	4,089	35	0	69	304	457
7	R772 Dublin Road between Beech Road and M11	10,735	10,897	11,491	11,954	140	187	210	929	1,394
8	Beech Road west of Kilbride Road	4,791	4,863	5,128	5,335	0	0	0	0	0
9	Kilbride Road between Beech Road and Site	1,911	1,940	2,045	2,128	200	659	786	3,479	5,218
10	Beech Road between Kilbride Road and R772 Dublin Road	6,101	6,193	6,530	6,794	200	1,134	786	3,479	5,218
11	R772 Dublin Road south of Beech Road	11,374	11,546	12,174	12,666	60	354	576	2,550	3,824
12	R772 Dublin Road north of R750 Sea Road	13,595	13,800	14,551	15,139	30	0	576	2,550	3,824
13	R750 Sea Road	5,405	5,487	5,786	6,019	0	0	46	203	304
14	R772 Ferrybank between Sea Road and North Quay	16,390	16,638	17,544	18,252	60	329	530	2,347	3,520
15	North Quay	5,864	5,953	6,277	6,530	0	0	90	399	599
16	R772 Arches between North Quay and Main Street	18,102	18,375	19,376	20,158	60	283	440	1,948	2,921
17	R772 Main Street	13,944	14,155	14,925	15,528	30	0	356	763	1,144
18	Lower Main Street	4,458	4,525	4,771	4,964	30	0	84	0	0

Link No	Link Name	Do Minimum (Base + School + Construction)			Base 2026 + Construction	Do Minimum + Scheme		
		2027 (without School)	2032	2042		Phase 1 2027 (113 units)	Phase 2 2032 (500 units)	Phase 3 2037 (750 units)
1	L2172 Redcross Road north of M11	1,724	1,847	1,920	1,698	1,744	1,937	2,055
2	M11 EB off-slip	1,715	1,806	1,878	1,690	1,731	1,879	1,986
3	M11 EB on-slip	3,600	3,795	3,946	3,547	3,681	4,152	4,482
4	L2172 between EB and WB slips	6,375	6,810	7,079	6,281	6,490	7,317	7,839
5	M11 WB on-slip	1,602	1,687	1,754	1,579	1,624	1,786	1,902
6	M1 WB off-slip	3,763	3,966	4,124	3,707	3,831	4,270	4,581
7	R772 Dublin Road between Beech Road and M11	11,037	11,818	12,281	10,875	11,239	12,708	13,617
8	Beech Road west of Kilbride Road	4,863	5,128	5,335	4,791	4,863	5,128	5,335
9	Kilbride Road between Beech Road and Site	2,140	2,904	2,987	2,111	2,895	6,245	7,998
10	Beech Road between Kilbride Road and R772 Dublin Road	6,393	7,864	8,127	6,301	7,126	11,105	12,989
11	R772 Dublin Road south of Beech Road	11,606	12,588	13,079	11,434	12,165	15,064	16,793
12	R772 Dublin Road north of R750 Sea Road	13,830	14,581	15,169	13,625	14,406	17,131	18,993
13	R750 Sea Road	5,487	5,786	6,019	5,405	5,533	5,989	6,324
14	R772 Ferrybank between Sea Road and North Quay	16,698	17,933	18,641	16,450	17,213	20,211	22,058
15	North Quay	5,953	6,277	6,530	5,864	6,043	6,676	7,129
16	R772 Arches between North Quay and Main Street	18,435	19,719	20,501	18,162	18,862	21,607	23,333
17	R772 Main Street	14,185	14,955	15,558	13,974	14,541	15,718	16,702
18	Lower Main Street	4,555	4,801	4,994	4,488	4,639	4,801	4,994

Link No	Link Name	Development increase in AADT				Development % Impact			Speed (kph)	Length (m)	% HGV
		Construction 2026	Phase 1 (113 units) 2027	Phase 2 (500 units) 2032	Phase 3 (750 units) 2042	Phase 1 (113 units) 2027	Phase 2 (500 units) 2032	Phase 3 (750 units) 2042			
1	L2172 Redcross Road north of M11	0	20	90	135	1%	5%	7%		200	6.7%
2	M11 EB off-slip	35	16	72	109	1%	4%	6%		200	12.3%
3	M11 EB on-slip	35	81	357	536	2%	9%	14%		200	7.6%
4	L2172 between EB and WB slips	70	115	507	760	2%	7%	11%		170	6.7%
5	M11 WB on-slip	35	22	99	148	1%	6%	8%		200	16.0%
6	M1 WB off-slip	35	69	304	457	2%	8%	11%		200	5.9%
7	R772 Dublin Road between Beech Road and M11	140	201	890	1,335	2%	8%	11%		1180	6.1%
8	Beech Road west of Kilbride Road	0	0	0	0	0%	0%	0%		200	No data
9	Kilbride Road between Beech Road and Site	200	755	3,341	5,011	35%	115%	168%		400	No data
10	Beech Road between Kilbride Road and R772 Dublin Road	200	733	3,241	4,862	11%	41%	60%	No data	300	6.3%
11	R772 Dublin Road south of Beech Road	60	559	2,475	3,713	5%	20%	28%		500	4.6%
12	R772 Dublin Road north of R750 Sea Road	30	576	2,550	3,824	4%	17%	25%		500	3.2%
13	R750 Sea Road	0	46	203	304	1%	4%	5%		200	1.4%
14	R772 Ferrybank between Sea Road and North Quay	60	515	2,278	3,417	3%	13%	18%		390	3.5%
15	North Quay	0	90	399	599	2%	6%	9%		200	0.0%
16	R772 Arches between North Quay and Main Street	60	427	1,888	2,833	2%	10%	14%		230	2.3%
17	R772 Main Street	30	356	763	1,144	3%	5%	7%		200	2.5%
18	Lower Main Street	30	84	0	0	2%	0%	0%		200	3.9%

Appendix 12.1

Resource and Waste Management Plan (RWMP)

PRELIMINARY RESOURCE & WASTE MANAGEMENT PLAN

FOR DEVELOPMENT

AT

"LANDS AT KILBRIDE",

ARKLOW,

CO. WICKLOW

Prepared for

Certain Assets of Dawnhill and Windhill Limited

Prepared by

Traynor Environmental Ltd

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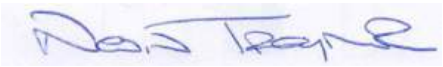
21st May 2025

Report Title:	Preliminary Resource & Waste Management Plan
Doc Reference:	25.083 TE
Client:	Certain Assets of Dawnhill and Windhill Limited
Authorised By:	 ***Nevin Traynor*** *BSc. Env, H. Dip I.T, Cert SHWW, EPA/FAS Cert.* *Environmental Consultant*

Rev No	Status	Date	Writer	Reviewer
1.	Draft	09th May 2025	Angela Kelly	Nevin Traynor
2.	Final	21st May 2025	Angela Kelly	Nevin Traynor

This report refers, within the limitations stated, to the condition of the site at the time of the report. No warranty is given as to the possibility of future changes in the condition of the site. The report as presented is based on the information sources as detailed in this report, and hence maybe subject to review in the future if more information is obtained or scientific understanding changes.

CONTENTS

1.0 INTRODUCTION

Traynor Environmental Ltd has prepared this Preliminary Resource & Waste Management Plan (PRWMP) on behalf of Certain Assets of Dawnhill and Windhill Limited for the proposed development at "Lands of Kilbride" in Arklow Co. Wicklow.

Certain Assets of Dawnhill and Windhill Limited intend to apply for a 7-year planning permission for a Large Scale Residential Development at this site of c.25.07ha on "Lands at Kilbride", Arklow, Co. Wicklow

The development will consist of 666 no. residential units comprising 578 no. 1-2 storey housing (100 no. 2 beds, 317 no. 3 beds, 161 no. 4 beds) and 88 no. apartments and duplex apartments (24 no. 1 beds, 51 no. 2 beds and 13 no. 3 beds. All residential units will have associated private open space facing north/ south/ east/ west. The proposal will also include a local centre comprising a creche (c.1095sqm), 3 no. community/medical units, and 3 no. retail units (along with the apartments). Building heights will range from one to five storeys. Part of the new regional road is also proposed connecting to the Kilbride Road, and the new access road provided by the "Kilbride Education Campus" along with upgrade works to the Kilbride Road L6179. A boardwalk will be provided across the Arklow town marsh and Avoca River connecting the site to Arklow town.

All associated site development works, site reprofiling, services provision, infrastructural and drainage works, surface water attenuation and natural attenuation systems, connection to public services and utilities, provision of ESB substation, bin stores bicycle stores, car parking, public lighting, landscaping, public and communal open spaces and boundary treatment works.

The principal objective of this RWMP is to provide a framework at the planning stage of the project to facilitate the further development of a project specific Detailed RWMP by the Contractor. The following waste management considerations will apply for the entire life-cycle of this construction project (hereafter referred to as 'the project').

1.1 Aim of the Plan

The purpose of this plan is to provide sufficient information to ensure that the management of construction waste is undertaken in accordance with all relevant legislation and best practice standards (as set out in Section 2 of this document). The principal aim of this plan is to ensure efficient use of material resources, reduce waste at source and reduce the quantity of waste that requires final off-site disposal to landfill in accordance with the waste hierarchy. A secondary aim is to facilitate the transition to a more circular economy thereby minimising the need for new inputs of virgin materials and energy, while reducing environmental pressures linked to resource extraction, emissions and waste management.

1.2. Methodology

This document has been prepared in accordance with the relevant industry standard guidance document; '*Best Practice Guidelines for the preparation of resource & waste management plans for construction & demolition projects*' (EPA, 2021). This guidance supersedes the '*Best Practice Guidelines on the Preparation of Waste Management Plans for Construction & Demolition Projects*' (Department of Environment, Heritage and Local Government (DoEHLG), 2006); In addition, the following relevant best practice guidance documents have also been consulted;

- 'Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-Hazardous' (EPA, 2018);
- 'A review of Design and Construction Waste Management Practices on Selected Case Studies – Lessons Learned' (EPA, 2015);
- 'Design out Waste: Preparation of Waste Reduction Factsheets for Design Teams' (EPA, 2015); and,
- 'Development of an Audit Methodology to Generate Construction Waste Projection Indicators for the Irish Construction Industry' (EPA, 2009).

- Wicklow County Development Plan 2016-2022 (WCC, 2016);
- Wicklow County Development Plan 2022-2028 and proposed amendments (WCC, 2022); and, Draft Development and Design Standards (WCC, 2022).

1.3. Need for the Plan

Within Section 3.1 of the guidance (EPA, 2021), it states that '*it is recommended that planning authorities stipulate that a Resource and Waste Management Plan (RWMP) shall be submitted for all construction and demolition projects as best practice to inform the planning consent process. It is recommended that all planning permissions granted include compliance with the RWMP as a standard condition of planning*.'

The level of detail presented in the RWMP should be reflective of the scale and complexity of the project and whether the project is within Tier 1 (smaller scale projects) or Tier 2 (larger scale projects) threshold. Tier 2: Larger scale projects are defined by the EPA as those '*including Strategic Infrastructure Developments, Strategic Housing Developments, infrastructure projects (road, rail, gas, energy)'* or any project above the relevant Tier 1 thresholds.

The proposed development comprises a Large Scale-Residential Development of 666 residential units, therefore this project is classed as a Tier 2 development.

This document applies only to the construction stage of the proposed development. An Operational Waste Management Plan has been prepared separately for the proposed development.

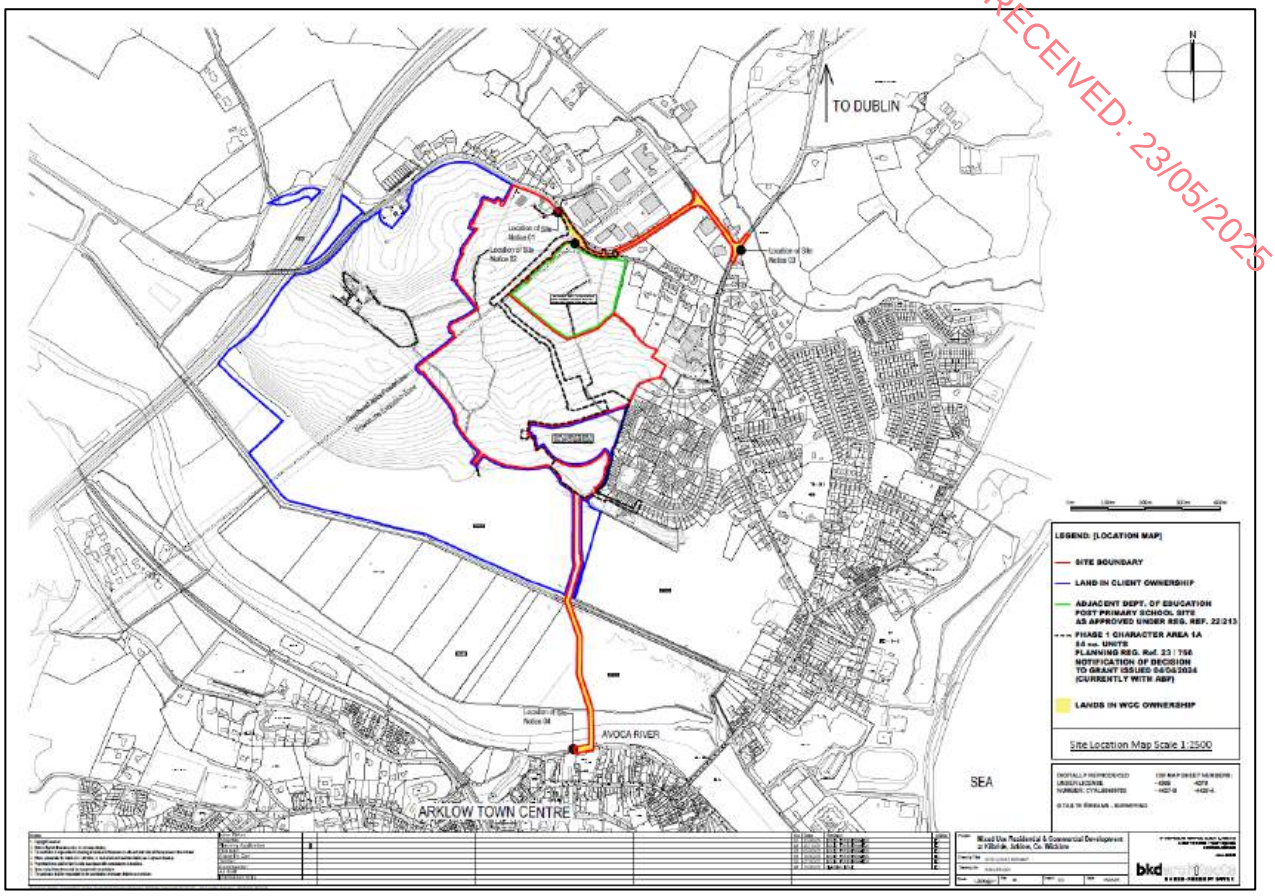
1.4. Format of the Plan

This is a live document which will be updated and added to throughout the project lifecycle. This document will provide a framework for waste management and will clearly identify the processes that will be implemented onsite, whilst also seeking to ensure compliance with relevant waste legislation, government policy objectives and project specific waste objectives. The Plan will provide a mechanism for monitoring and auditing waste management performance and compliance for the duration of the project.

The evolution of a single plan through a project lifecycle is recommended to ensure preventative and resource efficiency initiatives are undertaken, data are captured, and targets are set and measured throughout the project. This plan will evolve through the project from initial pre-construction phase followed by implementation at construction phase.

This construction resource and waste management plan (CRWMP) will be added to by the contractor. The CRWMP needs to be regularly revisited throughout a project's lifecycle so that opportunities to maximise waste reduction/ efficiencies are exploited throughout, and that data is added to on an ongoing basis so that it is as accurate as possible.

Figure 1.1 - Site Location (showing red-line application / site boundary)



2.0 POLICIES, LEGISLATION AND GUIDANCE

2.1 National Level

The implementation of the Waste Management Act in 1996 provided a legal basis for waste management practice and infrastructure in Ireland. Following the implementation of this Act, government policy moved from primarily relying on landfill disposal towards a more sustainable system of waste treatment through the promotion of recycling and recovery. The policy document entitled 'Changing our ways' (DoEHLG, 1998) set specific targets for recycling and consolidated the now familiar waste hierarchy of prevention, minimisation, reuse/recycling, energy recovery and disposal. This approach was supported by subsequent legislation.

In 2002, the policy statement 'Preventing and Recycling Waste: Delivering Change' (DoEHLG, 2002) specifically focused on waste prevention and recycling. This document emphasised the importance of adopting a hierarchical approach, with prevention highlighted as the most desirable option. Various national waste prevention programmes and best practice guidance documents were subsequently delivered by the government.

The relevant guidance document in respect of the preparation of waste management plans for the construction sector was subsequently published by the DoEHLG in 2006, entitled 'Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects'. The purpose of these guidelines was to promote an integrated approach to the management of C&D waste which all parties from planners, designers, contractors and regulators can adopt throughout the project lifecycle, to ultimately minimise the generation of C&D waste and to establish specific thresholds for the requirement of Waste Management Plans.

In 2011 the revised EU Waste Framework Directive was transposed into Irish law by the European Commission (Waste Framework Directive) Regulations 2011 (SI 126 of 2011) (EC, 2008). The Waste Framework Directive focussed on sustainable and efficient materials management strategy and provides a legal basis for the waste hierarchy. Therefore, the waste hierarchy presented in Figure 2.1 should be applied as a priority in Ireland.

Figure 2.1 - Accepted Best Practice Waste Hierarchy (Waste Framework Directive, 2018)

In 2012 the Government published a new policy document entitled 'A Resource Opportunity Waste Management Policy in Ireland' (DoECLG, 2012). This document sets out the steps to be implemented on a national scale to make further progress on resource efficiency and seeking the elimination of landfilling of municipal waste in Ireland. This approach is further supported by subsequent guidance including the EPA publication 'Green Procurement: Guidance for the Public Sector' (EPA, 2014) which clearly states the following Core Green Public Procurement (GPP) Criteria for the Construction sector:

- Construction environmental management plan;
- Staff training;
- Management of fuel and hazardous substances;
- Use of secondary aggregate and recycled materials;
- Water Management; and,
- Waste Management.

This EPA (2014) publication 'Green Procurement: Guidance for the Public Sector' clearly sets out the responsibility of the Contractor with regard to waste management and disposal, as follows:

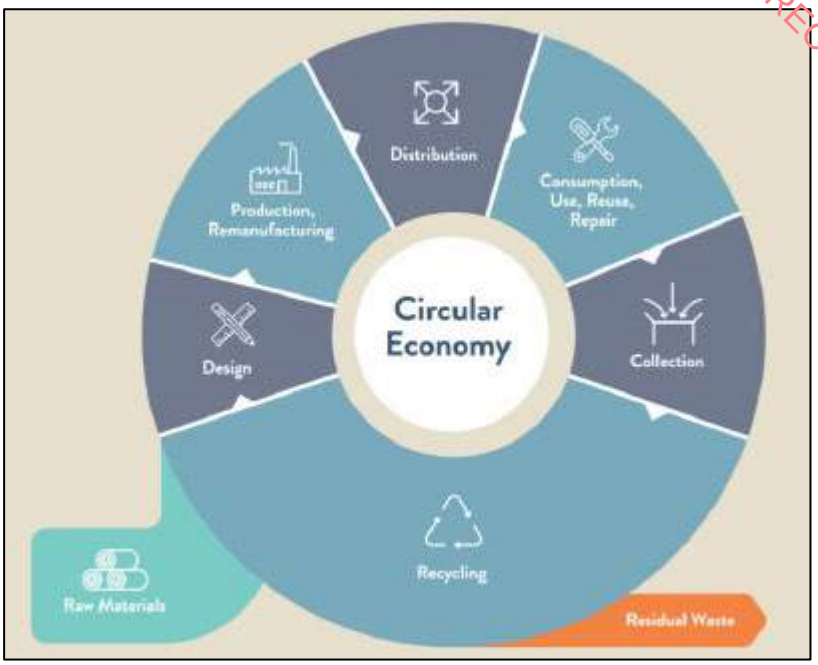
'The Contractor must apply appropriate measures in order to reduce and recover waste that is produced during the construction activity. The Contractor shall prepare and submit a waste management plan with its tender which shall form part of the Construction Management Plan to be agreed with the Contracting Authority in advance of the commencement of works. The waste management plan must be prepared in accordance with the Department of Environment, Community and Local Government Best practice guidelines on the preparation of waste management plans for construction and demolition projects (2006).'

'Contractors are responsible for disposing of all waste generated under the contract in accordance with the Waste Management Act 1996 as amended. The Contractor must have full use of, or access to, waste disposal facilities with appropriate licenses and permits. The Contractor must provide copies of valid EPA Waste licences and Local Authority Waste Permits (including those relating to their subcontractors or brokers, where applicable) for collection and waste treatment/disposal/export facilities.'

According to the EPA (2021) 'Green Public Procurement: Guidance for the Public Sector' '*Ireland has committed to implementing green public procurement (GPP) in all tenders using public funds by 2023*'. The Department of Communication, Climate Action and Environment published '*A Waste Action for a Circular Economy – Ireland's National Waste Policy 2020-2025*' report, in September 2020. This document was prepared in response to the 'European Green Deal' and sets out a roadmap for the transition to a new economy, where climate and environmental challenges are instead seen as opportunities. This report replaces the previous National Waste Management Plan '*A Resource Opportunity Waste Management Policy in Ireland*' (2012).

The 'Waste Action for a Circular Economy' report focuses on transition to a circular economy, shown in Figure 2.2, and the need to plan for C&D waste management at the earliest possible stage in a construction project, ideally at concept stage.

Figure 2.2 - The Circular Economy (DoCCAE, 2020)



- *'Shift the focus away from waste disposal and treatment to ensure that materials and products remain in productive use for longer thereby preventing waste and supporting reuse through a policy framework that discourages the wasting of resources and rewards circularity;*
- *Make producers who manufacture and sell disposable goods for profit environmentally accountable for the products they place on the market;*
- *Ensure that measures support sustainable economic models (for example by supporting the use of recycled over virgin materials); harness the reach and influence of all sectors including the voluntary sector, R&D, producers / manufacturers, regulatory bodies, civic society; and,*
- *Support clear and robust institutional arrangements for the waste sector, including through a strengthened role for Local Authorities (LAs).'*

The headline points on C&D waste in the Waste Action Plan are as follows:

- *'Project Ireland 2040 sets out the State's development goals over the next 20 years which allows for the opportunity to forecast large, specific C&D waste streams with a focus on preventing or efficiently managing the waste from these areas;*
- *Prevention of soil arisings which are a significant financial burden on the sector are to progress by placing value on the used material where possible. There is a strong focus on Article 27 by-product and Article 28 end-of-waste decision making process. These processes are to be streamlined and detailed guidance will be developed for specific problematic materials;*
- *The use of recycled construction materials will be incentivised (potentially by introducing a levy on virgin aggregates);*
- *The plan looks to make national end-of-waste decisions for specific construction and demolition waste streams at the earliest possible stage;* and,
- *The 2006 Best Practice Guidelines for construction and demolition waste will be revised to improve the Preparation of Waste Management Plans for Construction and Demolition Waste Projects'.*

2.2 Relevant Guidance

The EPA (2021) *'Best Practice Guidelines for the preparation of resource & waste management plans for construction & demolition projects'* supersedes the Department of Environmental, Heritage and Local Government (DoEHLG) (2006) *'Best Practice Guidelines on the Preparation of Waste Management Plans for Construction & Demolition Projects'*.

Since the publication of the 2006 guidelines, waste policy in Europe has shifted from the established linear economic model to a circular economic model. *'Circular economy-inspired interventions focus not only on increasing recycling quantitatively but also on:*

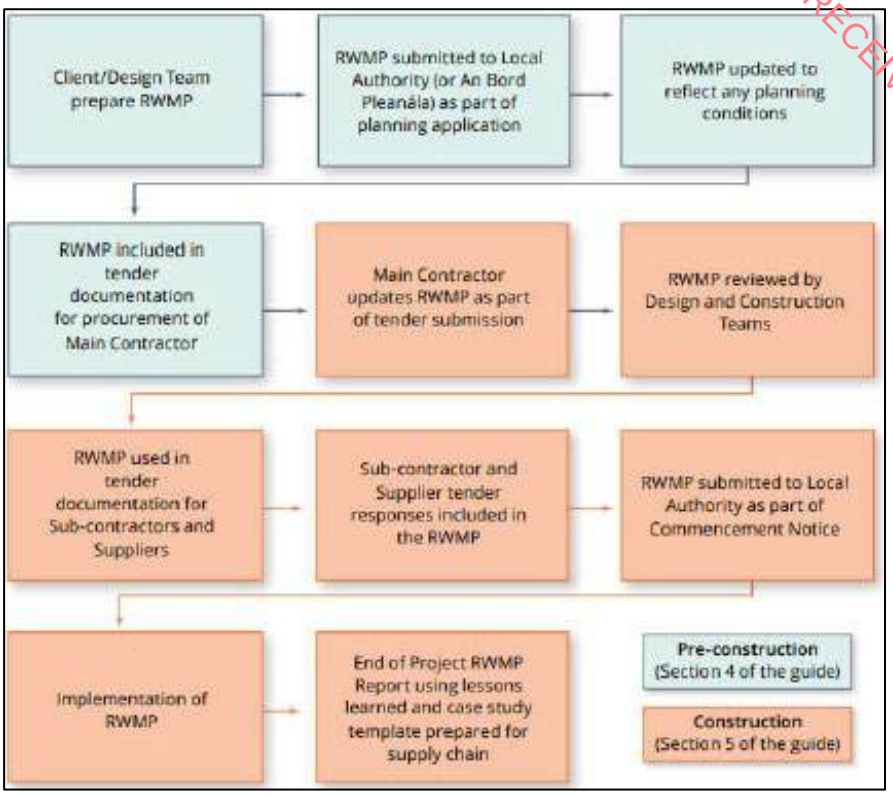
- *Reducing the use of virgin resources;*
- *Keeping materials in the economy as long as possible;*
- *Maintaining their intrinsic value/quality as high as possible; and,*
- *Reducing hazardous substances in products and waste'*. (EPA, 2021).

The resource and waste management approaches presented in the EPA (2021) guidelines 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.

These principles are applied to the Resource and Waste Management Plan (RWMP) through both the preconstruction phase and the construction phase. The evolution of a single plan through a project lifecycle is recommended to ensure preventative and resource efficiency initiatives are undertaken, data is captured, and targets set and measured throughout the project. The evolution of the plan through the project from initial preconstruction phase (in green) followed by implementation at construction phase (in orange) is illustrated in Figure 2.3 below.

Figure 2.3 - Project Life Cycle of the RWMP (EPA, 2021)



According to the EPA (2021) the level of detail presented in the RWMP should be reflective of the scale and complexity of the project and whether the project is within the following Tier 1 or Tier 2 thresholds.

- Tier 1: Smaller scale projects, below the following thresholds:
  - 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 1,250m²;
  - Retrofit of commercial, industrial, infrastructural, institutional, educational, health and other developments with an aggregate floor area less than 2,000m²; and,
  - Demolition projects generating in total less than 100m³ in volume of C&D waste.
- Tier-2 projects: Larger scale projects, including Strategic Infrastructure Developments, Strategic Housing Developments, infrastructure projects (road, rail, gas, energy) or any project above Tier 1 thresholds (presented above).

2.3. Regional Waste Management Plan

The Regional Waste Management Plan for Wicklow County Council (WCC) is the Eastern-Midlands Region Waste Management Plan 2015-2021 which was published in May 2015. The EMR Waste Management Plan 2015 – 2021 has been superseded as of March 2024 by the National Waste Management Plan for a Circular Economy (NWMPCE) 2024 - 2030.

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:

Proposed National Targets

- 1A. (Residual Municipal Waste) 6% Reduction in Residual Municipal Waste per person by 2030
- 2A. (Contamination of Materials) 90% of Material in Compliance in the Dry Recycling Bin
- 2B. (Material Compliance Residual) 10% per annum increase in Material Compliance in the residual bin. (90% by the end of 2030)
- 3A. (Reuse of Materials) 20kg Per person / year – Reuse of materials like cloths or furniture to prevent waste

The overarching objectives of the Eastern-Midlands Region Waste Management Plan 2015-2021 have been incorporated into the latest development plan pertinent to this site i.e. Wicklow County Development Plan 2022-2028.

The *Wicklow County Development Plan 2022-2028* sets out a number of policies for Arklow area, in line with the objectives of the regional waste management plan. Waste objectives with a particular relevance to the proposed development are:

Waste Management Policies and Objectives

Solid Waste Management Objectives

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.

Hazardous Waste Objectives

CPO 15.7	To facilitate the development of sites, services, and facilities for the disposal of hazardous household wastes in accordance with the objectives of the Regional Waste Management Plan.
CPO 15.8	In relation to the Prevention of Major Accidents (Control of Major Accident Hazards Involving Dangerous Substances) legislation, it is an objective to: • comply with the Seveso III Directive in reducing the risk and limiting the potential consequences of major industrial accidents.

- where proposals are being considered for the following: (i) new establishments at risk of causing major accidents, (ii) the expansion of existing establishments designated under the Directive, and (iii) other developments proposed near to existing establishments; the Council will require that applicants must demonstrate that the following considerations are taken into account: (i) prevention of major accidents involving dangerous substances, (ii) public health and safeguarding of public health, and (iii) protection of the environment;

2.4. Waste Legislation

It will be the Contractor's responsibility to ensure that they are familiar and comply with the requirements of all relevant waste legislation for the duration of the project. The following non-exhaustive list of legislative requirements typically apply to the construction stage of major developments:

- Waste Framework Directive 2008/98/EC of the European Parliament and Council on waste, as amended,2018 (S.I. 2018/851);
- European Communities (Waste Directive) Regulations (Directive 2008/98/EC) 2011 (SI 126 of 2011) as amended 2016 (S.I 315 of 2016), as amended, 2018 (S.I. 2018/851), as amended 2020 (S.I. No. 323 of 2020);
- Waste Management Act of 1996, 2001 and 2003;
- Litter Pollution Act of 1997, and as amended in 2009 and 2017;
- Litter Pollution Regulations 1999, S.I. No. 359 of 1999);
- European Communities (Waste Electrical and Electronic Equipment) Regulations 2011 (S.I. 355 of 2011), as amended 2011 (S.I. No. 397 of 2011) 2013, (S.I. No. 32 of 2013);
- European Union (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014) and 2019 (S.I No. 233 of 2019);
- Waste Management (Facility Permit and Registration) Regulations 2007, S.I. No. 821 of 2007, as amended, 2008 (S.I. No. 86 of 2008), 2015 (S.I. No. 198 of 2015), 2019 (S.I. No. 250 of 2019);
- Waste Management (Collection Permit) Regulations 2007, S.I. No. 820 of 2007), as amended, 2015 (S.I. No. 197 of 2015), 2016 (S.I. No. 24 of 2016);
- Waste Management (Licensing) Regulations 2004 (S.I. No. 395 of 2004) as amended 2010 (S.I. No. 350of 2010);
- Waste Management (Miscellaneous Provisions) Regulations, 1998, S.I. No. 164 of 1998;
- Waste Management (Landfill Levy) Regulations 2008, S.I. No. 199 of 2008, as amended 2009, (S.I. No. 550 of 2009), 2010 (S.I. No. 31 of 2010), 2012 (S.I. No. 221 of 2012), 2013 (S.I. No. 194 of 2013), 2015 (S.I. No. 189 of 2015), 2019 (S.I. No.182 of 2019);
- Waste Management (Hazardous Waste) Regulations, 1998, as amended, 2000 (S.I. No. 73 of 2000);
- Waste Management (Shipment of Waste) Regulations 2007, S.I. No. 419 of 2007;
- Waste Management (Movement of Hazardous Waste) Regulations, 1998 (S.I. No. 147 of 1998);
- European Communities (Shipments of Hazardous Waste Exclusively within Ireland) Regulations 2011, S.I. No 324 of 2011;
- European Communities (Transfrontier Shipment of Waste) Regulations 1994 (S.I. No. 121 of 1994);
- Waste Management (Transfrontier Shipment of Waste) Regulations 1998, as amended, 2014 (S.I. No. 861 of 2014);
- Waste Management (Tyres and Waste Tyres) Regulations 2007 (S.I. No. 664 of 2007), 2017, as amended (S.I. No. 400 of 2017) and 2018 (S.I. No. 96/2018);
- European Union (Batteries and Accumulators) Regulations 2014, S.I. No. 283 of 2014, as amended, 2014 (S.I. No. 349 of 2014), 2015 (S.I. No. 347 of 2015);
- Waste Management (Registration of Brokers and Dealers) Regulations 2008, SI No. 113 of 2008;
- Waste Management (Prohibition of Material Disposal by burning) Regulations 2009, S.I No. 286 of 2009, as amended 2013 (S.I. No. 504 of 2013), 2017 (S.I. No. 599 of 2017);
- European Waste Catalogue (EWC) and Hazardous Waste List 2002;
- Waste Management (Food Waste) Regulations 2009, S.I. No 508 of 2009, as amended, 2015 (S.I. No. 430 of 2015);

- European Union (Properties of Waste Which Render It Hazardous) Regulations 2015, S.I. No. 233 of 2015 as amended 2018 (S.I. No. 383/2018);
- Air Pollution Act, 1987 (Emission Limit Values for use of Asbestos) Regulations, 1990, S.I. No. 28 of 1990, as amended 1996 (S.I. No. 264/1996);
- EC (Control of Emissions of Gaseous & Particulate Pollutants from Non-Road Mobile Machinery) Regulations 2007, S.I. No.147 of 2007, as amended, 2011 (S.I. No. 263 of 2011), 2012 (S.I. No. 407 of 2012), 2013 (S.I No. 417 of 2013), 2016 (S.I. No. 2016/1628);
- The EU Regulation 2037/2000 (CFC's, HCFC's, Halons) - Ozone Depleting Substances. Control of Substances that Deplete the Ozone Layer Regulations 2006, S.I. No 281 of 2006, as amended, 2011 (S.I. No. 465 of 2011);
- EU F Gas Regulations 2014, S.I. No. 517 of 2014;
- Waste Management (Packaging) Regulations 2014 (S.I. 282 of 2014) as amended 2015 (S.I No 542 of 2015);
- Planning and Development Acts 2000 to 2015, as amended 2018, 2019 and 2020;
- Protection of Environment Act 1992 as amended 2003 and 2017;
- European Union (Ship Recycling) (Waste) Regulations 2019 (SI. No 13/2019);
- European Union (Environmental Impact Assessment) (Waste) Regulations 2013
- SI. No. 505 of 2013;
- Industrial Emissions Directive 2010/75/EU; and,
- Landfill Directive 1999/31/EC.

2.5. Waste Soils Classification

According to the EPA Document 'Waste Classification, List of Waste & Determining if Waste is Hazardous or Non-Hazardous' '*correct classification is the foundation for ensuring that the collection, transportation, storage and treatment of waste is carried out in a manner that provides protection for the environment and human health and in compliance with legal requirements*' (EPA, 2018). The waste classification system within this EPA guidance document applies across the EU and is the basis for all national and international waste reporting obligations.

Since 2015, waste classification is based on:

- Commission Decision of 18 December 2014, amending Decision 2000/532/EC on the list of waste pursuant to Directive 2008/98/EC of the European parliament and of the Council (2014/955/EEC) [referred to hereafter as 'The List of Waste (LoW)'].
- Commission Regulation (EU) No 1357/2014 of 18 December 2014, replacing Annex III to Directive 2008/98/EC of the European Parliament and of the Council on waste and repealing certain Directives. Soils requiring offsite disposal should be appropriately characterised, prior to transport and disposal, as follows;
- Representative chemical analytical results are input into a waste classification tool (to determine the relevant List of Waste (LoW) Code) and if the waste soils are hazardous or non-hazardous;
- Representative Waste Acceptance Criteria (WAC) analytical results are then separately screened against the relevant screening values (as established under the European Communities Council Decision ((EC) 92003/33/EC) 'COUNCIL DECISION of 19 December 2002 establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC); and,
- All waste soils removed from site must be transported by appropriately permitted hauliers and must be disposed of to an appropriately authorised disposal / recovery facility (via. valid Certificate of Registration, Waste Facility Permit, or Waste Facility Licence).

3.0 PROJECT DESCRIPTION

3.1 Site Location & Surrounding Land Use

The site is located in the area of Kilbride on the northern side of the Avoca river. The site is bounded by the town marsh to the south, M11 to the west, housing at Avondale Crescent / Murell Drive and St. Josephs School to the east and the Kilbride Industrial estate and Kilbride Road L-6179 to the north. The site slopes in a broadly north / south direction to the town marsh and Avoca river.

The new strategic road infrastructure which will connect the Kilbride Road L-6179 through the site to the western end of Arklow town via a new bridge. The Local Services Centre which will provide retail and local services at the centre of the masterplan. A series of parks and landscaped spaces throughout the plan within easy walking distance of all residential units. Active open space / sport use lands located along the western boundary of the site beside the M11. A landscaped buffer zone at the southern edge of the development to engage with the town marsh in an appropriate manner. A pedestrian / cycle connection to Arklow town in the southeastern corner of the site, through Avondale Crescent or via an alternative route in this area. A landscaped buffer zone around the Pyramid and associated graveyard to enhance its setting.

3.2 Proposed Development

The development consists of:
Certain Assets of Dawnhill and Windhill Limited, intend to apply for permission for a Large-Scale residential development on a c.25.07ha on "Lands at Kilbride", Arklow, Co. Wicklow. The site is generally bounded by the town marsh to the south, M11 to the west, housing at Avondale Crescent/ Murrell Drive and St Joseph's School to the east and the Kilbride Industrial estate and Kilbride Road L-6179 to the north.

The development will consist of 666 no. residential units comprising 578 no. 1-2 storey housing (100 no. 2 beds, 317 no. 3 beds, 161 no. 4 beds) and 88 no. apartments and duplex apartments (24 no. 1 beds, 51 no. 2 beds and 13 no. 3 beds. All residential units will have associated private open space facing north/ south/ east/ west.

The proposal will also include a local centre comprising a creche (c.1095sqm), 3 no. community/medical units, and 3 no. retail units (along with the apartments). Building heights will range from one to five storeys.

Part of the new regional road is also proposed connecting to the Kilbride Road, and the new access road provided by the "Kilbride Education Campus" along with upgrade works to the Kilbride Road L6179. A boardwalk will be provided across the Arklow town marsh and Avoca River connecting the site to Arklow town.

All associated site development works, site reprofiling, services provision, infrastructural and drainage works, surface water attenuation and natural attenuation systems, connection to public services and utilities, provision of ESB substation, bin stores bicycle stores, car parking, public lighting, landscaping, public and communal open spaces and boundary treatment works.

This development will form part of larger / future phase of development of the Action Area Plan AAP3.

Figure 3.1 – Site Layout Plan 1/2

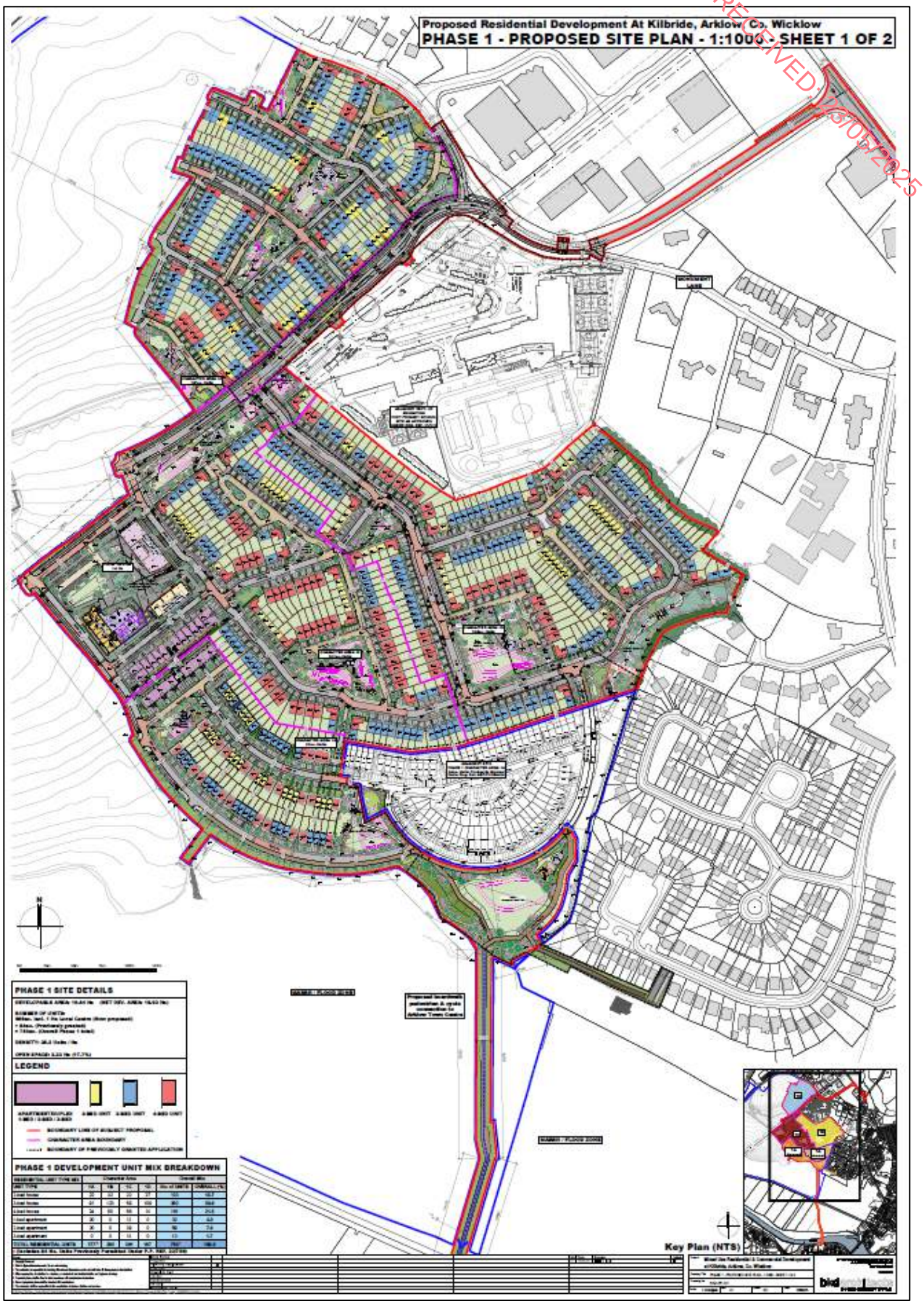


Figure 3.2 - Site Layout Plan 2/2

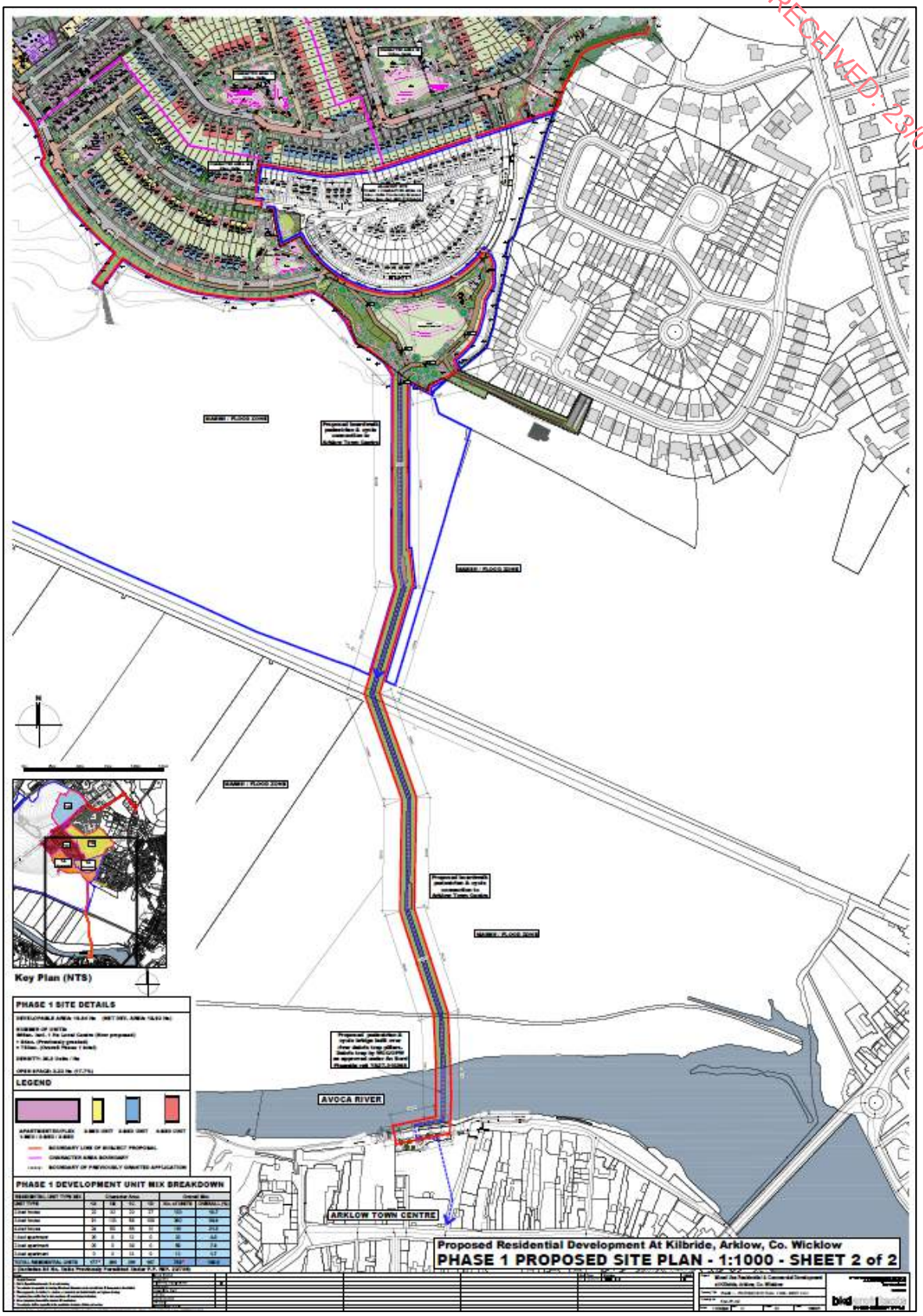


Figure 3.3 – Proposed Boardwalk Long Section Sheet 1.

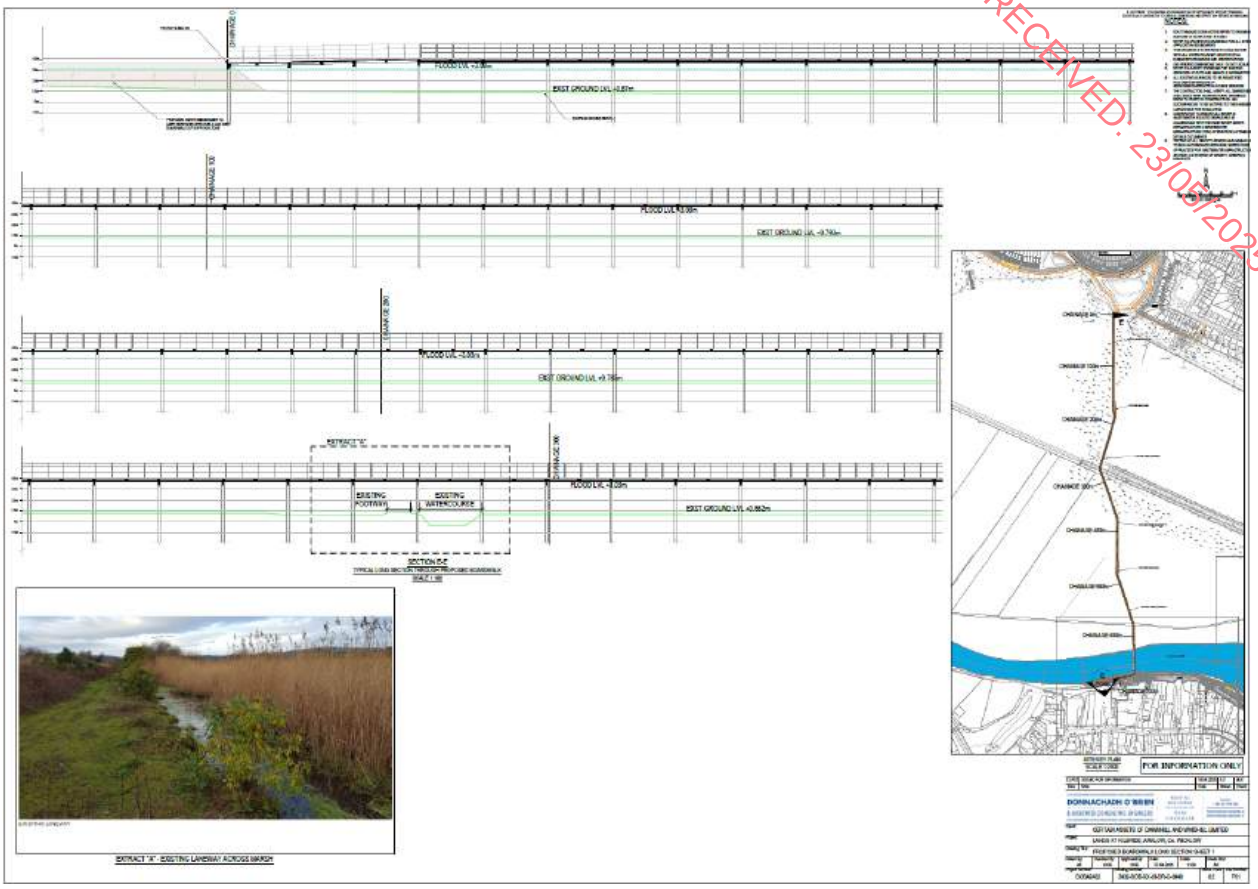
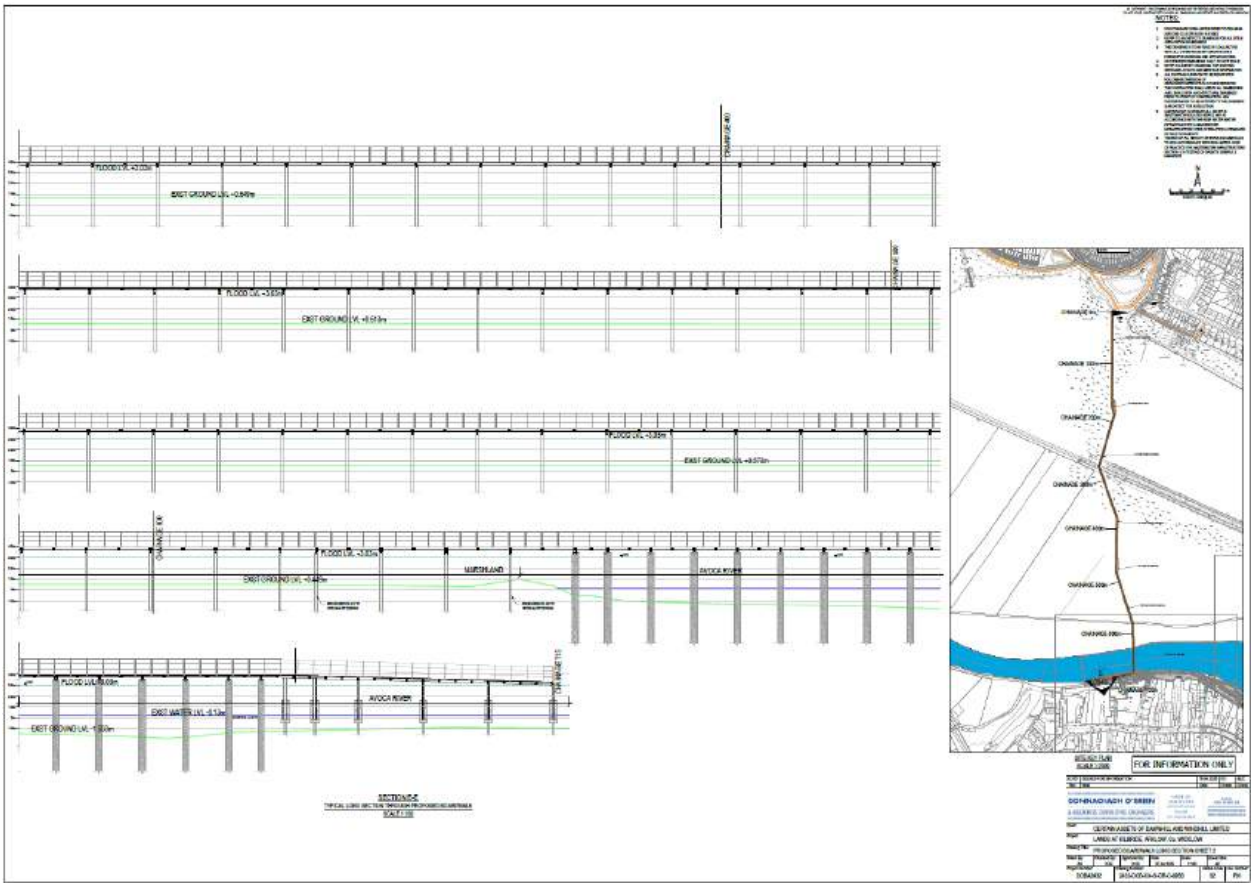


Figure 3.4 – Proposed Boardwalk Long Section Sheet 2.



3.2.1 Phasing of the Project

Table 3.1 below identifies the key infrastructural deliverables along with the phasing period to which they will be constructed. Given the extent of the project, along with the site's masterplan and the AAP3 lands, the outline phasing strategy for the delivery of necessary external infrastructural works shall be phased in accordance with Table 1 and read in conjunction with the phasing of the residential units in Table 3.2

Table 3.1 Outline Infrastructural Phasing Strategy

Infrastructural Upgrade	Commentary	Phasing/Delivery
Dublin Road / Beech Road Junction Improvement	Including signalisation and pedestrian improvement works	Phase 1
Realignment of L-6179 Road to north of site		Phase 1
Avondale Crescent VRU Links	These are already approved as part of the 84 unit scheme	Phase 1
Greenway Boardwalk across Marsh and Avoca River	The phasing of this will be dependent on the delivery of the debris trap columns and the riverside public realm works as part of the Arklow Flood Relief Scheme. Following consultation with WCC on the programme, these works are currently scheduled to be complete in Q3/ Q4 2028. It is therefore expected that this infrastructure can only be delivered in Q1/Q2 2029.	Phase 3 / 4 (subject to completion of OPW Arklow Floor Relief Scheme)
Uisce Eireann – Wastewater (based on advice in current Confirmation of Feasibility from UE)	PWSA currently in place between Lioncor & UE. Upgrade works are required for successful connection agreement.	Phase 1
Uisce Eireann – Water (based on advice in current Confirmation of Feasibility from UE)	Network adjustments to valving arrangements/ DMA on the existing network Upgrade of 300m of 6" AC main to 300mm diameter main along Monument Lane Tie in 50mm uPC main in Ticknock Lane with approx. 130m of 150mm diameter main Upgrade approx. 900m of 6" AC main to 300mm diameter pipe (across bridge)	Phases 1 & 2 Phase 1 Phase 2 Phase 4

Table 3.2 Outline Construction/ Phasing Strategy

Phase 1	
Enabling Works & Site Set Up	30 months of the first 265 units with associated infrastructure.
Installation of the surface water outfall pipe and headwalls for both outfall locations	
Installation of Watermain Upgrade along Monument Lane and Installation of Connection to upgraded main.	
Installation of spine surface water sewers, wastewater sewers, water mains and surface water attenuation.	
Installation of Upgraded PWSA Wastewater sewers to the east of the site to the Dublin Road	

Construction of L6179 Road Alignment and modification works to the Beech Road and Dublin Road Junctions	
Construction of Phase 1 housing units	
Installation of Phase 1 roads, footpaths & cycle paths and shared surfaces	
Installation of Phase 1 hard and soft landscaping and permeability links including VRU Greenway link to Avondale Crescent.	
Phase 1A	
Site Set Up	
Installation of surface water sewers, wastewater sewers, water mains and surface water attenuation.	18 months for completion of Neighbourhood Centre, Apartment units with associated infrastructure
Construction of Phase 1A Neighbourhood Centre and Apartment units	
Installation of Phase 1A roads and footpaths	
Installation of Phase 1A hard and soft landscaping and permeability links to adjacent phases	
Phase 2	
Installation of surface water sewers, wastewater sewers, water mains and surface water attenuation.	30 months for completion of second phase of 141 units with associated infrastructure & open space
Construction of Phase 2 housing units	
Installation of Phase 2 roads and footpaths	
Installation of Phase 2 hard and soft landscaping and permeability links to adjacent lands	
Upgrade of Watermain infrastructure in Ticknock Lane	
Phase 3	
Installation of surface water sewers, wastewater sewers, water mains and surface water attenuation.	20 months for completion of third phase of 139 units with associated infrastructure & open space
Construction of Phase 3 housing units	
Installation of Phase 3 roads and footpaths	
Installation of Phase 3 hard and soft landscaping and permeability links to adjacent lands	
Construction of the Boardwalk Greenway Link to Arklow Town	
Phase 4	
Installation of surface water sewers, wastewater sewers, water mains and surface water attenuation.	30 months for completion of second phase of 167 units with associated infrastructure & open space
Demolition of Existing Building and associated boundary walls and hardstanding to the north of the phase.	

Construction of Phase 4 housing units
Installation of Phase 4 roads and footpaths
Installation of Phase 4 hard and soft landscaping and permeability links to adjacent lands
Upgrade works to approx. 900m Watermain to 19 arch bridge

3.3 Construction Phase

Houses

The proposed mixed use Large scale Residential Development will result in the demolition of an existing dwelling and 2 no. sheds/outbuildings and the construction of 666 no. residential units with a mix of semidetached and terraced houses along with duplex apartments and apartments. These will comprise 1, 2, 3 and 4 bed units. All residential units will have associated private open space facing north/ south/ east/ west. The proposal will also deliver a local centre containing 3 no. retail units, 3 no. community/ medical units and 1 no. creche unit. The construction of the houses will generally consist of:

- traditional excavation and strip footing foundations in names reinforced concrete
- masonry rising walls, imported Sr21 Annex E stone fill material to depths of between 300 and 600mm typically
- normal internal sub floor gravity drainage and services connections
- ground floor construction of 150mm RC mesh reinforced slab on 150mm insulation on a radon barrier
- superstructure in off-site timber framed constriction including prefabricated timber trussed roofs
- building envelope in a mixture of brick and rendered blockwork
- roof materials in tiles and/or slates and all associated rainwater goods and guttering
- normal internal trades including electrical, plumbing, carpentry, plastering, painting , decorating and fit out
- external boundary curtilage walls in masonry blockwork and proprietary post and panel fencing
- all associated normal external works including local foul and surface water drainage, telecom and electrical connections, driveway permeable paving and path , landscaping and finishing

Site Infrastructural Works

A new road providing vehicular access is also proposed connecting to the north to Kilbride Road along with road improvements in the surrounding area. The site infrastructural works will include for:

- All public road to be built to taken in charge standards complete with paths, cycle track, road markings, signage, road crossings, table tops
- All associated foul and surface water drainage infrastructure to service the above roads
- including all necessary off-site works deemed required by Irish Water of the Local Authority of
- foot of any planning granted or connection offer for services
- All watermains, hydrant's, valves, meters and connections – all to Irish Water standards
- All utility connections for electricity, Gas, telecoms and public lighting together with
- substations, mini pillars etc.
- All site landscaping incorporating, trees and planting, public open spaces and all associated
- site development works to enable the development including boundary treatments,
- attenuation storage area and SuDS features

Boardwalk

A significant part of the development will be the provision of a greenway pedestrian and cyclist boardwalk between the proposed development at Kilbride, across the Arklow marshlands and Avoca River connecting to the proposed Arklow to Shilelagh Greenway on the southern bank of the Avoca River. A separate Outline Construction Methodology is submitted with this application and should be referred to by the contractor when developing a final Construction Stage CMP.

This Greenway starts adjacent to the public Cark Park in Arklow town centre. A River Walkway is being delivered by Wicklow County Council (WCC) as part of the Arklow Flood Relief Scheme and the Boardwalk will tie into the proposed levels of the River Walkway. There has been significant consultation and engagement between the applicant and Wicklow County Council prior to the application to co-ordinate the boardwalk design.

The proposed Boardwalk extends form the southern side of the residential development, through the internal cycle and pedestrian network of the residential development. The boardwalk is elevated and across the marshlands (approximately 650m) after which it crosses the Avoca River. Debris trap columns constructed in reinforced concrete are being provided by Wicklow County Council as part of the Avoca River Flood Relief scheme, and following extensive consultation with Wicklow County Council, the boardwalk will extend across the debris trap columns and will tie into the proposed levels of the Greenway on the southern side of the Avoca River. The Debris Trap piers and Greenway are approved works as part of WCC's Arklow Flood Relief Scheme.

3.3.1 Details of the Non-Hazardous Wastes to be Produced

Waste materials generated during the construction stage will primarily comprise topsoil and excavated subsoil during the installation of structural foundations, installation of the storm water and foul water drainage works, watermains and laying of cable ducts, surplus general building waste materials, and waste generated by construction workers.

In accordance with good practice, excavated soils will be reused onsite where feasible, including for boundary treatment and landscaping purposes, if suitable. Any surplus soils will be disposed of offsite in accordance with all relevant waste management legislation and best practice requirements.

Should any ground contamination be encountered during the construction phase of the development the Employer and Employers Representative, and the Resource Manager should be immediately notified and consulted with. Appropriate measures must be put in place, as set out below, including appropriate transport and disposal of such waste materials to a suitably licenced facility in accordance with all relevant waste legislation.

According to the EPA '*Correct classification is the foundation for ensuring that the collection, transportation, storage and treatment of waste is carried out in a manner that provides protection for the environment and human health and in compliance with legal requirements*'. Hence soils requiring offsite disposal must be characterised as per the requirements of the relevant Waste Acceptance Criteria (WAC) under the European Communities Council Decision ((EC) 92003/33/EC) 'COUNCIL DECISION of 19 December 2002 establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC'. Soils requiring offsite disposal will also require waste classification in strict accordance with the requirements of the EPA as set out in the following document 'Waste Classification List of Waste & Determining if Waste is Hazardous or Non-hazardous' (EPA, 2018). All waste soils removed from site must be transported by appropriately permitted hauliers and must be disposed of to an appropriately authorised disposal / recovery facility (via. valid Certificate of Registration, Waste Facility Permit, or Waste Facility Licence).

Surplus construction materials including concrete blocks, cladding, metals, tiles, glass, plastics, packaging, and timber will be generated during the Construction Phase. Materials will be segregated and recycled were possible; all other materials will be disposed of offsite in accordance with all relevant waste management legislation and best practice requirements. Additional waste generated by onsite personnel during the construction works will broadly include the following; canteen waste, waste arising from temporary onsite self-contained welfare facilities, and a minor volume of waste electrical and electronic equipment. A breakdown of the likely waste streams which will be generated is presented in Section 6.

3.3.2. Details of Potentially Hazardous Wastes to be produced

3.3.2.1. Fuels, Oils and Chemicals

Hazardous materials (fuels, oils and chemicals) will be used at the site during the Construction Phase. As per industry standards any fuel and oils temporarily stored onsite will be stored in double skinned / appropriately bunded storage tanks, in a secure dedicated fuel storage location onsite. All other chemicals including paints, varnishes, glues, adhesives, degreasing agents and cleaning agents will be securely stored in a dedicated temporary bunded chemical store onsite. All machinery including any generators / pumps used onsite should be checked at the start of each work shift for evidence of any fuel or oil leaks (and removed offsite for any repairs as may be required).

Fuel, oil and chemical spill kits should be available at the designated storage areas, along with the relevant Safety Data Sheet (SDS). SDS documents contain information on the potential hazards (health, fire, reactivity and environmental) and how to work safely with the relevant chemical. All site operatives should receive training in appropriate refuelling methods and machinery hecks, and chemical handling methods to be implemented onsite. Taking account of these control measures, along with the fact that the volumes of paints, varnishes, glues, adhesives etc. will be minor, it is not expected that any waste fuel, oil or chemicals will be generated during the Construction Phase.

3.3.2.2. Contaminated Soils

Based on available information no potential sources of significant onsite ground contamination associated with current or historic land-use have been identified. Therefore, the risk of encountering significant ground contamination (i.e. hazardous soils) beneath the site is considered to be highly unlikely at this preliminary juncture.

Nonetheless excavation works during the Construction Phase should be monitored and in the highly unlikely event that contaminated materials are encountered these will need to be segregated from all uncontaminated soils, temporarily stored (any stockpiles should be lined and covered by heavy duty 1000-gauge plastic), sampled and analysed for relevant parameters (Waste Acceptance Criteria suite e.g. Rilta Disposal Suite). Any contaminated soils must be characterised as per the requirements of the relevant Waste Acceptance Criteria (WAC) under the relevant European Communities Council Decision (EC) (92003/33/EC) and classified in accordance with the requirements of the EPA as set out in the following documents 'Waste Classification List of Waste & Determining if Waste is Hazardous or Non-hazardous' (EPA, 2018). Any contaminated soils must be transported by appropriately permitted hauliers and disposed of to an appropriate EPA licensed Waste Facility in accordance with all relevant waste management legislation.

4.0 ROLES & RESPONSIBILITIES

For the purposes of clarity, the roles and responsibilities of the project team for the proposed development should be determined at the very outset of the construction stage of this project. Key roles are typically performed by the Client, Engineer, and Contractor as presented in Table 4-1 below. Specific details will be determined during the Detailed Design and Contract stage.

Table 4-1 - Roles and Responsibilities

Employer	**Planning Agents**
The Client: **Tel:** **Contact:**	**The Planner:** **Tel:** **Contact:**
Employers Representative	**Design Team**
The Engineer: **Tel:** **Contact:**	**The Architect:** **Tel:** **Contact:**
Project Supervisor for the Design Process (PSDP)	**Civil, Structural and Environmental Team**
The Engineer: to be confirmed **Tel:** to be confirmed **Contact:** to be confirmed	**The Environmental Consultant:** **Tel:** **Contact:**
Masterplan Architect	**Landscape Architect**
The Engineer: **Tel:** **Contact:**	**The Landscape Architect:** **Tel:** **Contact:**
Project Supervisor Construction Stage (PSCS)	**Contractor**
The Contractor: to be confirmed **Tel:** to be confirmed **Contact:** to be confirmed	**The Contractor:** to be confirmed **Tel:** to be confirmed **Contact:** to be confirmed

The EPA (2021) *'Best Practice Guidelines for the preparation of resource & waste management plans for construction & demolition projects'* state that a number of responsibilities for the development of resource & waste management plans are identified for parties under Waste Framework Directive 2008/98/EC including the following:

- *'Original Waste Producer means anyone whose activities produce waste or anyone who carries out pre-processing, mixing or other operations resulting in a change in the nature or composition of this waste (in this case the Client);* and,
- *Waste Holder means the waste producer or the natural or legal person who is in possession of the waste (the Client)'*.

The EPA (2021) *'Best Practice Guidelines for the preparation of resource & waste management plans for construction & demolition projects'*, highlights the responsibilities of the following key personnel for implementing resource & waste management plans.

4.1. Client

The responsibilities of the client are as follows:

- Require the preparation and submission of an RWMP as part of the design and planning submission;
- Require the preparation and submission of an updated RWMP as part of the construction tendering process;
- Ensure that the RWMP is agreed and submitted to the local authority prior to commencement of works on site; and,
- Request the end-of-project RWMP from the Contractor.

4.2. Design Team

The responsibilities of the design team are as follows:

- 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;
- Include details and estimated quantities of all projected waste streams;
- Incorporate relevant conditions imposed in the planning permission into the RWMP;
- Handover of the RWMP to the Contractor at commencement of construction for the development of the RWMP in a similar fashion to how the safety file is handed over to the Contractor; and,
- Work with the Contractor as required to meet the performance targets for the project.

4.3. Contractor

The responsibilities of the contractors are as follows:

- Adding to, implementing and reviewing the RWMP through construction (including the management of all suppliers and sub-contractors) as per the requirements of these guidelines;
- Identifying a designated and suitably qualified Resource Manager (RM) who will be responsible for implementing the RWMP;
- Identifying all hauliers to be engaged to transport each of the resources / wastes off-site;
- End-of-waste and by-product notifications addressed with 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) should be maintained for the duration of the project;
- Carry out training and site inductions; and,
- Preparing a RWMP Implementation Review Report at project handover.

5.0 DESIGN APPROACH

5.1 Design for Reuse and Recycling

The site preparation works will involve excavation for the installation of foul and surface water drainage system works, structural foundations, internal roads and underground utilities during the construction phase.

A volume of 88,861.89 cubic metres of fill material is calculated across the site to deliver the proposed development to final levels. 44,347.11m3 of this fill material will be provided by the initial cut material which has been calculated to final levels. The remaining fill material required for the site shall be supplemented by the material from dwelling unit foundation excavations, sewer / watermain excavations, utilities and services excavations, and road excavations. It is anticipated that overall, the development will have a balanced cut and fil when all surplus soil for the construction is taken into account. It is normal that some soil material becomes unusable, or cross contaminated with other material and this material will need to be disposed of in the normal manner to a licenced facility.

In accordance with good practice, excavated soils will be reused onsite where feasible, including for boundary treatment and landscaping purposes, if suitable. Any excess topsoil to be transported offsite will be transported to an appropriately licenced, permitted or registered facility. The soil will be characterised in accordance with EPA, 'Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-Hazardous' and Council Decision, 2003 on establishing criteria and procedures for the acceptance of waste at landfills.

An application may be made to the EPA under Article 27 of the European Communities (Waste Directive) Regulations 2011 for the use of excess soil or materials as a by-product if a definite use and need for this material can be determined. Also an application may be made to the EPA under Article 28 which sets out the grounds by which a material, which is recovered or recycled from waste, can be deemed to be no longer a waste and complies with a set of end-of-waste criteria (substance/ object to be used for specific purposes, a market or demand exists, fulfils technical requirements and no overall adverse impact to human health or the environment).

During the construction, the contractor will review availability of recycled aggregates and other materials in the local area and decide on the most sustainable options, for example, the use of an on-site crusher for recycling of residual concrete to generate aggregates for use on site (subject to the appropriate waste consent, such as an Article 28 end of waste decision and once processing is industry standard practice, such as ensuring the aggregate outputs comply with the specifications of IS EN 13242).

The contractor will review 'new' materials to be used as part of the proposed development, which contain a recommended percentage of recycled content if they meet the functional, performance and regulatory requirements and are available locally at a reasonable cost.

Design for Reuse and Recycling is the most efficient way of designing low carbon infrastructure and feeds into the circular economy as opposed to a linear economy where product is treated as 'waste' at the end of its life.

All apartment buildings have been designed to use standardised pre-cast structural columns and floor slabs allowing for their easy disassembly and reuse at end-of-life stage. All houses have been designed using a timber frame construction that allows for their disassembly and re-use at end-of-life stage. Furthermore, standardised internal dry lining systems, standardised flooring systems and internal doors have all been considered within the design.

5.2 Design for Green Procurement

When selecting suppliers, it is essential to assess the technical capabilities required for the products or services being procured. This is valuable from the buyers' point of view as suppliers that clearly cannot meet the requirements will be

eliminated. In addition, it is also useful for the suppliers to get a clear understanding of how committed the Client is to protect sustainability and what will be essential for any submission to be successful.

At an early stage (pre-procurement), the client will have discussion with potential contractors, subcontractors and suppliers regarding the following:

- Waste prevention and minimisation during the construction stage;
- Proposed design solutions to encourage innovation in tenders and incentivise competitions to recognise sustainable approaches;
- Use ordering procedures that avoid waste, i.e. no over-ordering, take-back schemes for both material surplus and offcuts;
- Discuss options for packaging reduction with subcontractors and suppliers using measures such as 'Just-in-Time' delivery; and,
- Set reuse and recycling rates.

Green procurement integrates environmental considerations that include a combination of cost and quality into the procurement process. In order to help achieve this, both operational and embodied carbon targets for this project will be set out early on in collaboration with the design team in order to ensure that green procurement can take place. Through comparative data on embodied carbon, low carbon materials options will be favoured where possible. A sustainable construction plan will be developed that addresses all aspects of construction relating to design from reducing demolition, considering reuse / upcycling and recycling of existing materials to approaching suppliers for green construction materials e.g. Responsible Steel and adopt Design of Off-Site Construction. 'The use of off-site manufacturing reduces residual wastes by up to 90% (volumetric building versus traditional)' (EPA, 2021). Low carbon additives to industry standard components will also be considered as part of this process e.g. the use of GGBS in concrete can be a way to reduce its carbon footprint whilst still achieving the structural and fire benefits of concrete.

On the Coastal Quarter, modern methods of construction (MMC) are proposed. The use of prefabricated concrete panels and the use of timber frame construction will lead to a large proportion of the waste generated during the prefabrication processes being recycled within the factory, leading to less than ca. 10% of materials ultimately going to landfill. Designing using MMC also provides for a safer work environment for suppliers and builders, and it reduces risks of air pollution on the site and its surrounding areas through construction activities (e.g. dust generation) or transport (fuel emissions).

5.3. Design for Material Optimisation

As stated in the EPA (2021) guidelines the key design principle for design for material optimisation '*is to ensure manufacturers and construction companies adopt lean production models, including maximising the reuse of materials onsite. This helps to reduce the environmental impacts associated with transportation of materials and from waste management activities.*' Design for material optimisation includes the use of standardised sizes for certain materials to help reduce the number of offcuts produced on site, focusing on promotion and development of off-site manufacture. Wherever possible the Coastal Quarter development will be designed to size standards and repeat modules e.g. in façade components to reduce unnecessary wastage and additional costs. An effort will also be made to design out unnecessary complex fixings.

5.4. Deign for Flexibility and Deconstruction

It will be the contractor's responsibility to ensure that all products (including buildings) only contain materials that can be recycled and are designed to be easily disassembled, where possible. As per the EPA (2021) guidelines, the design team will '*consider material efficiency for the duration and end of life of a building project; 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*'. The design

team take account of future deconstruction as part of the overall design process, to allow for the re-use of building components e.g. using bolts instead of welding and screws instead of nails or the use of adhesives. Large architectural components such as pre-cast columns and hollow core slabs that could be taken apart and reused at end-of-life are also considered.

6.0 KEY MATERIAL & QUANTITIES

6.1 Type of Waste

The waste generated onsite is surplus or waste materials arising from either the materials imported to site or from those generated on site. Imported materials are those which are imported to site for inclusion into the temporary and permanent works (such as concrete, construction aggregates, asphalt and cabling etc.). Included within this waste stream is product packaging. This waste stream is produced from a range of potentially preventable activities. Such activities include damaged materials and the over ordering of materials. This waste stream is described as construction (C) waste within the RWMP. Site generated materials are those which exist within the proposed works footprint such as topsoil and sub-soil etc. This waste stream is categorised as excavated (E) waste within the RWMP. Refer to Table 6-1 for the breakdown of types of waste. For both groups of materials there are a number of considerations to waste management such as waste reduction, segregation of waste, disposal of waste, financial impacts of waste disposal and recording, monitoring, education and reviewing data.

Table 6.1 - Breakdown of Types of Waste

Type of waste	Description
Imported material	Where possible, consideration should be given to the re-use of material back into the project development works. Any waste produced through the importation of materials needs to be monitored and included in the RWMP under construction works. Where possible, consideration should be given to the use of recycled imported material such as concrete, which has a higher recycled content.
Excavated materials (E)	Materials such as excavated soils should be segregated during the excavation process. Appropriately experienced staff should supervise the excavation works to manage the segregation of soil materials. Site-derived materials of a similar nature should be stockpiled together and any changes in the physical and/or chemical properties should prompt further segregation. Soils should be placed in clearly identified stockpiles and chemical testing undertaken to confirm the potential for re-use on site, or, if considered inappropriate for re-use (due to geotechnical or chemical properties or being surplus), to inform off site treatment and/or disposal routes. Where soil materials meet the geotechnical and chemical criteria for re-use given the proposed end use scenario, such materials may be re-used on site, if required. Any surplus materials should be removed from site for either direct beneficial use elsewhere (such as land remediation schemes) where an application may be made to the EPA under Article 27 of the European Communities (Waste Directive) Regulations 2011 for the use of excess soil as a by-product if a definite use and need for this material can be determined or for recycling or recovery at an appropriately permitted off-site facility. Where excavated materials are affected by contamination, such materials should be separated and sent for either treatment, where appropriate, or disposal at appropriately permitted facilities. Disposal of excavated material will be by licensed carriers, to licensed landfill sites and handled in accordance with the Waste Management Regulations.
Concrete	This waste will be generated by works and the buildings for the proposed project.
Wood	Packaging such as pallets.
Packaging	From construction materials, etc.
Plastic	Offcuts of pipework/ducting etc.

Vegetation	The majority of the existing trees along the boundary are being retained for the proposed project with planting of hedgerow and ornamental shrub and Herbaceous plants proposed. Additionally, meadow planting is proposed as well as amenity grass and open spaces. Further landscape details are included in the Landscape Design for the proposed project (Parkhood, 2022). Where vegetation / landscaping elements are being removed, re-use of such materials should be considered where possible. E.g. suitable vegetation could be turned into mulch or compost to be re-used for landscape purposes.
Metals	Offcuts from reinforced concrete for building foundations. Metal components or assets removed for site clearance.
Paper and Cardboard	Packaging from components delivered to site.
Segregated Haz Waste	Nominal 1% to account for packaging that contained hazardous material such as oils, solvents, sealants etc.

In relation to the overall works particular attention is drawn to the following waste/soil related activities:

- The site location deliveries/ removals are to phone ahead; Just-in-Time' (JIT) delivery processes; receive precise directions and named person to liaise with on site. The Contractor is to erect required signage approaching site and ensure deliveries are programmed to cause minimal disruption;
- Hazardous manual handling operations are to be avoided so far as is reasonably practicable; and,
- Note that waste generated by the project will be managed in compliance with Waste Management Act 1996, Waste Management (amended) Act 2003 and associated Regulations.

6.2 Summary of Potential Waste Streams (LoW / EWC Codes)

It is understood that all the waste arising from the construction works will be transported off site by an approved waste contractor holding all the necessary waste collection and transportation permits. All the waste arisings requiring reuse, recycling, recovery or disposal will be brought to facilities holding the appropriate Certificate of Registration, Waste Licence or Waste Permit, as required.

A summary of the main hazardous and non-hazardous waste streams which could arise during the Construction Phase are presented in Table 6-2, along with the relevant List of Waste (LoW) code. The LoW code (also referred to as European Waste Catalogue (EWC) code) serves as a common method of characterising various waste streams. Assignment of waste codes will determine how and where the generated waste can be disposed of. LoW codes must be selected for each waste type – a full description of each code is available on the EPA website.

It should be noted that the summary list presented in Table 6-2 is a non-exhaustive list and it will be the Contractors responsibility to ensure all waste streams generated onsite during the Construction Phase for this project are appropriately characterised, managed and disposed of in accordance with all relevant waste management legislation.

Table 6.2 - Summary list of LoW Codes, which may be relevant to the site

Waste Material	LoW Code
Concrete	17 01 01
Bricks	17 01 02
Tiles and ceramics	17 01 03
Wood	17 02 01-03
Glass	17 02 02
Plastic	17 02 03
Bituminous mixtures, coal tar and tarred products	17 03 02
Copper, Bronze, Brass	17 04 01
Aluminium	17 04 02
Lead	17 04 03
Zinc	17 04 04
Iron & steel	17 04 05
Tin	17 04 06
Mixed metals	17 04 07
Soil and Stones	17 05 04
Gypsum-based construction material	17 08 02
Mixed C&D waste	17 09 04

6.3 Soil Generation

The site preparation works will comprise the stripping of topsoil across the Site, excavation of subsoil and pouring of foundations for the residential and commercial units, installation of the storm water and foul water drainage works, watermains and laying of cable ducts, and piling as required.

The total volume of soil requiring excavation for the proposed development is expected to be ca. 44,347.11m^3. The amount of fill which will be reused on site is 88,861.89m^3.

All such material will be removed and disposed offsite to a suitably permitted / licenced waste recovery / disposal facility in accordance with relevant waste management legislation (including but not limited to the Waste Management Act of 1996, 2001 and 2003 and all subsequent waste management regulations as amended).

Any soil transported off-site will be characterised in accordance with EPA guidance, '*Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-Hazardous*' and Council Decision, 2003 on establishing criteria and procedures for the acceptance of waste at landfills. An application may be made to the EPA under Article 27 of the European Communities (Waste Directive) Regulations 2011 for the use of excess soil as a by-product if a definite use and need for this material can be determined.

6.4 Demolition Waste Generation

The proposed development will include demolition of 3 no. buildings to the north of the site, dwelling, agriculture shed and outbuilding. The total Gross Internal Floor Area to be demolished for all three buildings is 711.62 m^2.

Breakdown of Demolition Waste Expected.

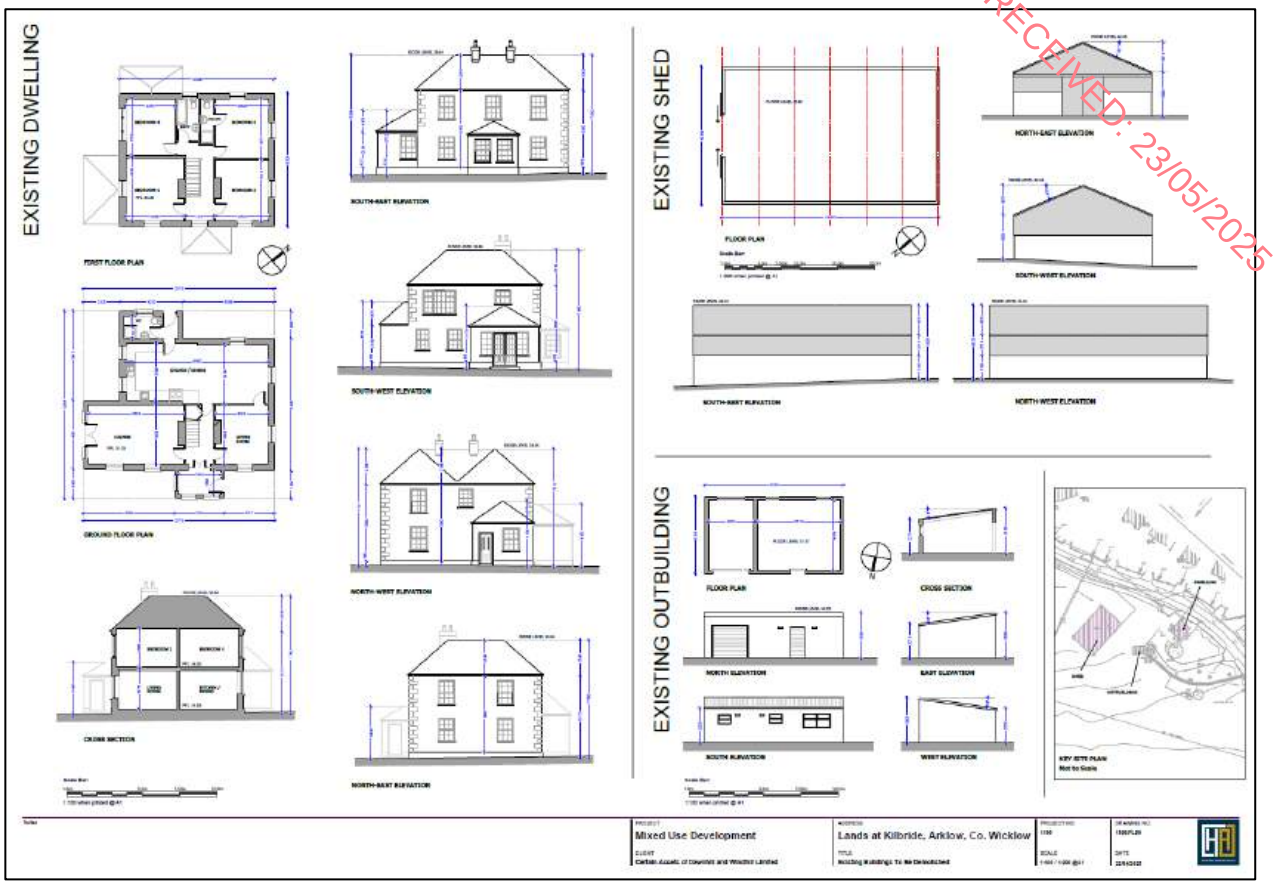
- Removal of 28.80 tonnes of masonry boundary of walls with associated 3.53 tonnes of steel railings, gates, gate piers and concrete foundations along the L-6179 in conjunction with the removal of external 63.45m3 concrete driveways/ hardstanding and grassed verges.
- Removal of 1 no. steel framed buildings (533.9m2) with 53.40m3 of concrete ground floors & foundations, 13.81 tonnes of non-insulated façades and roof cladding.
- Removal of 1 no. domestic dwelling and 1 no. associated garage building (172 m2) with 76.36m3 of concrete ground floors & foundations, 44.91 tonnes of insulated façades and roof cladding and external glazing, 5.93 tonnes of internal load and non-load bearing masonary and lightweight partitions.

It is envisaged that the duration of the demolition works described will be approx. 2 weeks. The key elements of the demolition with regards to the potential impact on the surrounding area are:

- Site Set up, fencing & hoarding.
- Removal of any hazardous materials (Chemicals, Paints, Oils/fuels).
- Soft Stripping.
- Demolition/Dismantling/Salvaging.
- Transport off Site of material using appropriate waste contractors where material cannot be infilled.

Figure 6-1 Location of Buildings to be Demolished.

Figure 6-2 Existing Buildings to be Demolished.



6.5 Construction Waste Generation

Table 5.2 shows the breakdown of C&D waste types produced on a typical site based on data from the EPA National Waste Reports, the GMIT and other research reports.

Table 6.4 Waste materials generated on a typical Irish construction site.

Waste Types	%
Mixed C&D	33
Timber	18
Metals	8
Concrete	6
Other	15
Total	**100**

Table 5.3 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 5.2 and the schedule of areas supplied.

Table 6.5 Estimated on and off-site reuse, recycle and disposal rates for construction material.

Waste Types	Tonnes	Reuse		Recycle/Recover		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Mixed C&D	2579.28	10	257.93	80	2063.42	10	257.93
Timber	2188.48	40	875.39	55	1203.66	5	109.42
Plasterboard	781.60	30	234.48	60	468.96	10	78.16
Metals	625.28	5	31.26	90	562.75	5	31.26
Concrete	468.96	30	140.69	65	304.82	5	23.45
Other	1172.40	20	234.48	60	703.44	20	234.48
Total	**7816.00**		**1774.23**		**5307.05**		**734.70**

6.6 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 arisings requiring disposal off-site will be reused, recycled, recovered, or disposed of at a facility holding the appropriate registration, permit or licence, as required. Written records will be maintained by the contractor(s) detailing the waste arising throughout the C&D phases, 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

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.

When 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 Article 27 of the European Communities (Waste Directive) Regulations 2011, 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, pending environmental testing to classify the material as hazardous or non-hazardous in accordance with the EPA Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous publication. 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 Article 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 Article 27. Article 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 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 Transfrontier Shipment of Wastes (TFS).

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.

Glass

Glass materials will be segregated for recycling, where possible.

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.

Asbestos

A Refurbishment/Demolition Asbestos Survey shall be carried out prior to the commencement of the demolition works, which is limited to some agricultural buildings to the north of the site. The buildings will be surveyed for the purpose of detecting and recording incidences of asbestos containing materials (ACMs). A report shall then be prepared which will contain a register showing the location and type of asbestos and the risks and recommendations in relation to the material identified. ACMs identified by the Asbestos survey will be required to be removed by a suitably trained and competent persons and removed from site by a suitably permitted Waste haulier where it shall be transported to a suitably licenced facility. The Contractor shall handle ACMs in accordance with the Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006, as amended and associated approved Codes of Practice. The Contractor shall be responsible for preparing specified Risk Assessment and Method Statements for the identification and removal of all ACMs on site, if appropriate to the works.

Invasive Species

An Ecological Site survey was carried out by Altemar Limited as part of the site ecological assessment for which this application relates, to assess, identify and manage any invasive species, such as Japanese Knotweed. No invasive species were recorded within the site, as defined by Schedule 3 of SI 355/2015, and no site-specific measures are deemed necessary to address the presence of invasive species.

6.7 Tracking and Documentation Procedures for Off-Site Waste

All waste transport and disposal / recovery must be carried out in accordance with relevant waste management legislation (outlined in Section 2) and any subsequent future legislation which may apply. A nominated Waste Manager for the project will be responsible for ensuring correct tracking and documentation procedures are undertaken for all waste removed from site during the project. Each consignment of waste removed from site will be tracked and recorded. A site record detailing the date, truck registration, waste type, estimated volume and destination will be filed onsite for each consignment, along with the corresponding truck docket and weighbridge record at the offsite disposal / recovery destination. A copy of the relevant waste collection permits and waste permit / waste licence for the relevant disposal / recovery facilities will be available onsite for the duration of the project.

6.8 Construction Waste Management Costs

Under the Waste Framework Directive 2008/98/EC and in accordance with the polluter-pays principle, there is a legal requirement that the costs of disposing of waste must be borne by the holder of waste or by the producers of the product from which the waste came, thereby placing the legal obligation for the management of the waste on the Client.

In terms of waste management and disposal costs, at this preliminary juncture it would not be feasible to estimate the total cost of waste management and disposal associated with the proposed development. Estimated costs will be determined by the Contractor.

7.0 SITE MANAGEMENT

7.1. Resource / Environmental Manager - Responsibilities

The Contractor will nominate a Resource Manager for the duration of the Construction Phase. The Resource Manager will be responsible for the efficient operation of onsite waste management procedures; they will also be responsible for ensuring that all waste removed offsite is appropriately characterised (under the correct LoW / EWC code), transported and disposed of in accordance with all relevant waste management legislation. It will be the Waste Managers responsibility to maintain all waste management and disposal / recovery records onsite throughout the project. These site records should be made available for viewing by the Client, Employers Representative and statutory consultees (WCC, EPA) as required.

The Resource Manager should be appropriately trained in the correct documentary procedure, waste auditing and best practice methods in onsite waste minimisation and waste management toolbox talks with site operatives to highlight any specific waste management concerns will also be carried out should the need arise.

7.2. Site Compound Location

All C&D waste materials will be segregated onsite into the various waste streams, via. Labelled dedicated skips and storage areas. Waste will be removed from site by a suitably permitted waste haulage contractor. The Contractor should clearly identify all proposed waste haulage contractors within the project specific RWMP. Each waste haulage contractor must hold a current valid waste collection permit issued by the National Waste Collection Permit Office (NWCPO).

The locations of the site compounds are selected to avoid any potential impacts to environmental receptors and to reduce any potential for impact on sensitive human receptors. The site compounds will also act as a storage centre for construction materials. The exact locations of the compound areas will be agreed with the appointed contractor and Wicklow County Council prior to the commencement of development and will be used throughout the construction period.

7.3. Training

All site personnel should receive waste management information and environmental induction before commencing work on the project, which will include a module on resource management as part of their initial site briefing from the Resources Manager. The initial briefing should include a discussion of the key points set out in the RWMP, along with the specific procedures to be implemented onsite to segregate and appropriately store the generated waste and key control measures such as refuelling procedures and oil, fuel and chemical storage requirements. This will ensure that all onsite personnel are familiar with the site-specific waste management strategy.

As a minimum the following will be included in the induction, as per the EPA (2021) guidelines:

- *'Scope and content of the RWMP;*
- *Project commitments and targets;*
- *List of anticipated resources and wastes and volumes to be generated;*
- *Procedures for the proper identification and segregation of resources and wastes;*
- *Temporary storage and the location of the WSAs;* and,
- *Clear instruction on hazardous wastes will be incorporated into the training programme and the particular dangers of each hazardous waste.'*

The environmental induction shall be provided and delivered by the Contractor and be tailored to suit the tasks and responsibilities of site personnel from management and supervisory level through to site operatives. Toolbox talks on resource management should be provided on a continuous basis. Regular toolbox talks shall ensure site staff are aware of

the resource management practices associated with their work and the appropriate control measures that are required to carry out their work in compliance with the RWMP.

7.3.1. Disposal / Recycling Proposals for Each Waste Stream

All C&D waste materials will be segregated onsite into the various waste streams, via. dedicated skips and storage areas. Waste will be removed from site by a suitably permitted waste haulage contractor. Each waste haulage contractor must hold a current valid waste collection permit issued by the National Waste Collection Permit Office (NWCPO).

All waste materials generated during the Construction Phase must be removed offsite to an appropriately permitted or licenced waste disposal / recovery facility.

7.3.2. Proposed Management Strategy for each Waste Stream

Key principles set out in the guidelines (EPA, 2021) include optimising resources and reducing waste on construction projects through:

- Prevention
- Reuse;
- Recycling;
- Green Procurement Principles;
- Off-Site Construction;
- Materials Optimisation; and,
- Flexibility and Deconstruction.

These principles are applied to the RWMP through both the pre-construction phase and the construction phase. Therefore, every effort should be made to prevent and limit the amount of waste generated at the very outset of the project. At the preparatory phase of the Construction Phase the following measures will aid the prevention of waste in the first instance;

- *Select procurement routes to minimise unnecessary packaging – for example applying 'Just-in-Time' (JIT) delivery processes to minimise material spoilage;*
- *Use of 'consolidation centres' to support JIT delivery – these are strategically-located storage and distribution facilities where materials can be stored prior to JIT delivery to sites;*
- *Implement ordering procedures and supply chain systems that avoid waste, i.e. no over-ordering, use of take-back schemes for packaging, material surplus and offcuts;*
- *Select procurement routes that minimise unnecessary packaging;* and,
- *Plan the work sequence to reduce the potential for on-site residual resource generation.*

7.4. Record Keeping

The Contractor, through the appointed Resource Manager, will be responsible for ensuring that the full details of all materials deliveries, materials movements and C&D waste generated is recorded during the Demolition and Construction Phases. Each C&D waste consignment removed from and to site will be tracked and documented to ensure full traceability of the material from site to the final destination. A single record will be completed for each individual consignment.

The Contractor will also receive printed receipts / weighbridge records from the waste disposal / recovery facilities for each individual consignment. These records will enable the Contractor to accurately quantify the total volume of waste removed for offsite disposal / recovery for each individual waste stream. These records will be maintained onsite and will be made available for auditing.

The type of information to be recorded in the site tracking system is described below in accordance with relevant guidelines and legislation:

- For each movement of resource off-site, a signed docket/invoice will be obtained by the RM from the haulier/contractor detailing the following:
    - Name the resource / waste stream.
    - List of Waste (Low) Code for each stream (where applicable).
    - Quantity of material moved off-site by the haulier/contractor (tonnes).
- The name and authorisation of the haulier to transport the material – in the case of a 'waste' this requires a valid Waste Collection Permit (WCP). In the case of by-product or other materials that are not a waste, no WCP is required. In both cases the vehicle registration number should also be recorded for each load of material removed from site.
- The name and authorisation of the destination site for the resource – again for a 'waste' this requires a valid Cert of Registration, Waste Permit or Waste Licence and in the case of by-product the relevant by-product determination.
- The waste contractors must be required to provide details of end-use or waste treatment in waste reports.
- This recording will be carried out for each resource type and the system will also be linked with the delivery records. In this way, the percentage of residual resource generated for each material can be determined.
- The system will allow the comparison of these figures with the targets established for the prevention, reuse and recovery of resources to highlight successes or failures against these targets.

7.5. Communications

The following communication tasks are recommended for the Resource Manager through the construction phase as per the EPA (2021) guidelines:

- 'Internal reporting of resource statistics to the Client and the Contractor management. This includes performance relative to agreed targets and objectives which should be included as an agenda item at site meetings;
- Engaging with relevant local authority on any site inspection or enforcement audits undertaken at the site. All follow-up actions and corrective actions should be logged and reported to the local authority.
- Engaging with other stakeholders (EPA, public, etc.) as appropriate in relation to the resource management on site; and,
- Upon completion of construction, the RM will prepare a final report summarising the outcomes of resource management processes adopted, the total reuse and recovery figures and the final destinations of all resources taken off-site. This report will be issued to the Client, Contractor management and the local authority. The local authority may make such a requirement a condition of planning and require the formal sign-off of same by the local authority for full planning compliance.'

7.6. Outline Waste Audit Procedures

According to EPA (2021) a resource Audit represents a systematic study of the waste management practices applied in the Project and is required to highlight firstly, the potential issues that can arise during the waste management process and secondly, the benefits of waste prevention and minimisation. Therefore, waste audits should be carried out routinely onsite by the Resource Manager. These audits will cover work practices, record keeping, and off-site tracking as follows in accordance with the EPA (2021) guidelines:

- When materials arrive on site, they will be properly recorded including the assignment of such materials to specific uses within the works;
- A review will be undertaken of onsite waste management practices to identify any improvements which may be required;
    - 'Ensure adequacy of site signage and need for any repairs or upgrades.
    - Adequacy of storage infrastructure and need for any repairs or upgrades.

- Compliance with resource segregation protocols and observed contamination in any resource streams.
- Assessment of observed Contractor and Sub-contractor work practices for compliance with the RWMP' (EPA, 2021).

- Onsite waste management processes / material management from materials delivery through to waste disposal / recovery (including the quantity, type and composition of all waste) will be reviewed to identify any opportunities for waste reduction;
- Corrective actions will be highlighted and implemented following each audit. Such actions include applying 'lessons learned' regarding efficient waste management on this project to other projects in the future to enable further waste reduction; and
- The key steps and findings from each waste audit should be presented in a summary report.

8.0 CONSULTATION WITH RELEVANT BODIES

Appropriate consultation should be undertaken with relevant bodies by various members of the project team as required throughout the project. Relevant consultees include, but are not limited to, the following;

- WCC (as the relevant local authorities for waste matters);
- The EPA (as relevant regulatory body for environmental matters);
- NWCPO;
- Permitted hauliers; and,
- Suitably permitted / licenced waste disposal / recovery facilities.

Appendix 12.2

Operational Waste & Recycling Management Plan (OWRMP)

PRELIMINARY OPERATIONAL WASTE & RECYCLING MANAGEMENT PLAN (POWRMP) FOR DEVELOPMENT

AT

"LANDS AT KILBRIDE",

ARKLOW,

CO. WICKLOW

Prepared for

Certain Assets of Dawnhill and Windhill Limited

Prepared by

Traynor Environmental Ltd

Reference Number

25.083 TE

Date of Issue

21st May 2025

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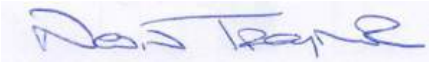
Client: Certain Assets of Dawnhill and Windhill Limited

Traynor Env Ref: 25.083TE

Status: Final

Date: 21st May 2025

Report Title:	Operational Waste & Recycling Management Plan
Doc Reference:	21st May 2025
Client:	Certain Assets of Dawnhill and 2Windhill Limited
Authorised By:	 *Nevin Traynor BSc. Env, H. Dip I.T, Cert SHWW, EPA/FAS Cert.* *Environmental Consultant*

Rev No	Status	Date	Writer	Reviewer
1.	Draft	09th May 2025	Angela Kelly	Nevin Traynor
2.	Final	21st May 2025	Angela Kelly	Nevin Traynor

This report refers, within the limitations stated, to the condition of the site at the time of the report. No warranty is given as to the possibility of future changes in the condition of the site. The report as presented is based on the information sources as detailed in this report, and hence maybe subject to review in the future if more information is obtained or scientific understanding changes.

CONTENTS

1.0 INTRODUCTION

This Preliminary Operational Waste Management Strategy (the 'Strategy ') has been prepared by Nevin Traynor BSc.Env, HDIP IT, Cert SHWW, IAH of Traynor Environmental Ltd on behalf of Certain Assets of Dawnhill and Windhill Limited in support of the proposed development (hereafter referred to as the 'Proposed Development') within the Arklow area of Co. Wicklow. It should be noted the Contractor appointed to undertake the works will be required to develop this framework document as part of their overall Construction Management Plan in line with their obligations under the Safety, Health, and Welfare at Work (Construction) Regulations 2013 as amended.

The principal aim of this Strategy is to demonstrate how the Proposed Development has considered sustainable methods for waste and recycling management during its operation. Furthermore, with regards to waste and recycling management within the Proposed Development, this Strategy has the following aims:

- To contribute towards achieving current and long-term government, Eastern Midlands Waste Region (superseded as of March 2024 by the NWMPCE 2024 – 2030) and Wicklow County Council targets for waste minimisation, recycling, and re-use.
- To comply with all legal requirements for handling operational waste.
- To achieve high standards of waste management performance, through giving (and continuing to give) due consideration to the waste generated by the Proposed Development during its operation; and
- To provide the Proposed Development with a convenient, clean, and efficient waste management strategy that enhances the operation of the Proposed Development and promotes recycling.

It is important to note that the Wicklow County Council is part of the Eastern Midlands Waste Region. The Eastern Midlands Waste Region comprises of Dublin City, Dún Laoghaire-Rathdown, Fingal, South Dublin, Kildare, Louth, Laois, Longford, Meath, Offaly, Westmeath, and Wicklow.

This Strategy provides a review of the requirements placed upon the Proposed Development under national legislation and implemented policy at all levels of government (i.e., national (Ireland), regional (Eastern Midlands Waste Region)), district and local (Wicklow). Consideration has also been given to requirements included in local standards and guidance documents (i.e., DoEHLG, Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities (2018) in line with the Regional Waste Management Plan and British Standard Waste Management in Buildings, Code of Practice (BS 5906:2005) to comply with relevant objectives and targets.

Estimate volumes of waste generated during operation of the Proposed Development have been provided in the report which also includes a breakdown of the waste management process, which details waste handling, storage area provision, and collection arrangements. All waste reduction measures are compliant with BS 5906:2005, Eastern Midlands Waste Region and Sustainable Urban Housing: Design Standards for New Apartments which are also discussed in this strategy.

2.0 LEGISLATION/ PLANNING POLICY

A summary of the European, national regional and local planning policy relevant to the Proposed Development is outlined in the section below. It should be noted that this summary identifies those elements of the policy or guidance applicable to waste management within the Proposed Development.

2.1 International and European Policy

The EU Waste Framework Directive (EU WFD) provides the overarching legislative framework for the collection, transport, recovery, and disposal of waste, and includes a common definition of waste. It encourages the prevention and reduction of harmful waste by requiring that Member States put waste control regimes into place. These waste management authorities and plans should ensure that necessary measures exist to recover or dispose of waste without endangering human health or causing harm to the environment and includes permitting, registration and inspection requirements.

The directive also requires Member States to take appropriate measures to encourage firstly, the prevention or reduction of waste production and its harmfulness and secondly the recovery of waste by means of recycling, re-use or reclamation or any other process with a view to extracting secondary raw materials, or the use of waste as a source of energy. The directive also puts an end to co-disposal of waste streams.

The definition of waste for the Ireland is governed by the EU WFS as:

"Any substance or object…which the holder discards or intends or is required to discard."

It is the responsibility of the holder of a substance or object to decide whether or not they are handling waste. The European Protection Agency is the authority responsible for enforcing waste management legislation in Ireland, but where there is a disagreement as to whether or not something is waste it is ultimately a matter for the courts to decide.

The European Waste Catalogue In 1994, the *European Waste Catalogue* and *Hazardous Waste List* were published by the European Commission. In 2002, the EPA published a document titled the *European Waste Catalogue and Hazardous Waste List*, which was a condensed version of the original two documents and their subsequent amendments. This document has been replaced by the EPA '*Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous*' which became valid from the 1st of June 2015. This waste classification system applies across the EU and is the basis for all national and international waste reporting, such as those associated with waste collection permits, COR's, permits and licences and EPA National Waste Database.

The European Landfill Directive is in place to reduce the negative effects of land filling on the environment and health. It aims to encourage waste minimisation and increased levels of recycling and recovery; the increased costs of land filling associated with compliance with the Directive will also encourage alternative waste management methods.

The first requirement of the regulations was a ban on the co-disposal of hazardous waste with non-hazardous waste in landfills. The Directive has also imposed a ban on whole tyres going to landfill since 2003, with this ban extending to shredded tyres from July 2006, while liquid wastes were banned from landfill from October 2007.

The Directive also brings with it, tighter site monitoring and engineering standards. This is supplemented by the European Waste Catalogue, which has extended the range of materials classified as 'hazardous', and the Waste Acceptance Criteria, which has introduced potential pre-treatment requirements.

2.2 National Legislation

The Government issued a policy statement in September 1998 titled as *'Changing Our Ways'* which identified objectives for the prevention, minimisation, reuse, recycling, recovery, and disposal of waste in Ireland. A heavy emphasis was placed on reducing reliance on landfill and finding alternative methods for managing waste. Amongst other things, Changing Our Ways stated a target of at least 35% recycling of municipal (i.e., household, commercial and non-process industrial) waste.

A further policy document *'Preventing and Recycling Waste – Delivering Change'* was published in 2002. This document proposed a number of programmes to increase recycling of waste and allow diversion from landfill. The need for waste minimisation at source was considered a priority.

This view was also supported by a review of sustainable development policy in Ireland and achievements to date, which was conducted in 2002, entitled *'Making Irelands Development Sustainable – Review, Assessment and Future Action'*. This document also stressed the need to break the link between economic growth and waste generation, again through waste minimisation and reuse of discarded material

In order to establish the progress of the Government policy document *Changing Our Ways*, a review document was published in April 2004 entitled *'Taking Stock and Moving Forward'*. Covering the period 1998 – 2003, the aim of this document was to assess progress to date with regard to waste management in Ireland, to consider developments since the policy framework and the local authority waste management plans were put in place, and to identify measures that could be undertaken to further support progress towards the objectives outlined in *Changing Our Ways*.

In particular, *Taking Stock and Moving Forward* noted a significant increase in the amount of waste being brought to local authority landfills. The report noted that one of the significant challenges in the coming years was the extension of the dry recyclable collection services.

In September 2020, the Irish Government published a new 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' (WAPCE), was prepared in response to the 'European Green Deal' which sets a roadmap for a transition to a new economy, where climate and environmental challenges are turned into opportunities, replacing the previous national waste management plan "A Resource Opportunity" (2012).

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 & 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) 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.

Since 1998, the Environmental Protection Agency (EPA) has produced periodic 'National Waste (Database) Reports' detailing, among other things, estimates for household and commercial (municipal) waste generation in Ireland and the level of recycling, recovery, and disposal of these materials. The 2019 National Waste Statistics, which is the most recent study published, along with

the national waste statistics web resource (November 2021) reported the following key statistics for 2019:

- **Generated –** Ireland produced 3,085,652 t of municipal waste in 2019. This is almost a 6% increase since 2018. This means that the average person living in Ireland generated 628 kg of municipal waste in 2019.
- **Managed –** Waste collected and treated by the waste industry. In 2019, a total of 3,036,991 t of municipal waste was managed and treated.
- **Unmanaged –** Waste that is not collected or brought to a waste facility and is, therefore, likely to cause pollution in the environment because it is burned, buried, or dumped. The EPA estimates that 48,660 t was unmanaged in 2019.
- **Recovered –** The amount of waste recycled, used as a fuel in incinerators, or used to cover landfilled waste. In 2019, around 83% of municipal waste was recovered – a decrease from 84% in 2018.
- **Recycled –** The waste broken down and used to make new items. Recycling also includes the breakdown of food and garden waste to make compost. The recycling rate in 2019 was 37%, which is down from 38% in 2018.
- **Disposed –** Less than a sixth (15%) of municipal waste was landfilled in 2019. This is an increase from 14% in 2018.

2.3 Regional Level

The proposed development is located in the Local Authority area of Wicklow County Council. The Eastern Midlands *Region Waste Management Plan 2015 – 2021* is the regional waste management plan for the Arklow area which was published in May 2015. The EMR Waste Management Plan 2015 – 2021 has been superseded as of March 2024 by the NWMPCE 2024 - 2030.

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:

Proposed National Targets

- 1A. (Residual Municipal Waste) 6% Reduction in Residual Municipal Waste per person by 2030
- 2A. (Contamination of Materials) 90% of Material in Compliance in the Dry Recycling Bin
- 2B. (Material Compliance Residual) 10% per annum increase in Material Compliance in the residual bin. (90% by the end of 2030) 3A. (Reuse of Materials) 20kg Per person / year – Reuse of materials like cloths or furniture to prevent waste.

Municipal landfill charges in Ireland are based on the weight of waste disposed. In the Leinster Region, charges are approximately €130 - €150 per tonne of waste which includes a €75 per tonne landfill levy introduced under the *Waste Management (Landfill Levy) (Amendment) Regulations 2015.* The Wicklow County Development Plan *2022 – 2028* sets out a number of objectives and actions for the Wicklow area in line with the objectives of the regional waste management plan. Wicklow County Council has prepared the Arklow and Environs Local Area Plan 2018 – 2024 which provides the local planning policy framework for the subject lands. The *Wicklow County Development Plan 2022 – 2028* came into force as of 22nd August 2022 and sets out a number of objectives for County Wicklow, in line with the objectives of the regional waste management plan. Waste objectives with a particular relevance to the development are:

- **POL 10-4:** Ensure the sustainable management of waste and the application of the 'Circular Economy' concept in line with the provisions of the National Waste Management Plan for a Circular Economy and the Waste Management Infrastructure – Guidance for Siting Waste Management Facilities, (Government of Ireland, 2022) in the development and management of new development.

- **OBJ 10-B** Support the National Policy Statement on the Bioeconomy (Government of Ireland, 2018) and any review thereof, having consideration to the strategic importance of the bioeconomy to rural Wicklow and support the preparation of a Bioenergy Implementation Plan for the Southeastern Region in conjunction with the Local Authorities and the Eastern Midlands Regional Waste Management office.

2.4 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. Secondary legislation includes:
  - European Communities (Waste Directive) Regulations 2011 (SI 126 of 2011) as amended
  - Waste Management (Collection Permit) Regulations (S.I No. 820 of 2007) as amended
  - Waste Management (Facility Permit and Registration) Regulations 2007 (S.I No. 821 of 2007) as amended
  - Waste Management (Licensing) Regulations 2004 (S.I. No. 395 of 2004) as amended
  - Waste Management (Packaging) Regulations 2014 (S.I. 282 of 2014) as amended
  - Waste Management (Planning) Regulations 1997 (S.I. No. 137 of 1997) as amended.
  - Waste Management (Landfill Levy) Regulations 2015 (S.I. No. 189 of 2015) as amended.
  - European Union (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014) as amended.
  - European Union (Batteries and Accumulators) Regulations 2014 (S.I. No. 283 of 2014) as amended
  - Waste Management (Food Waste) Regulations 2009 (S.I. 508 of 2009), as amended o European Union (Household Food Waste and Bio-waste) Regulation 2015 (S.I. No. 430 of 2015)
  - Waste Management (Hazardous Waste) Regulations, 1998 (S.I. No. 163 of 1998) as amended
  - Waste Management (Shipments of Waste) Regulations, 2007 (S.I. No. 419 of 2007) as amended
  - European Communities (Shipments of Hazardous Waste exclusively within Ireland) Regulations 2011 (S.I. No. 324/2011
  - European Communities (Transfrontier Shipment of Waste) Regulations 1994 (SI 121 of 1994)
  - European Union (Properties of Waste which Render it Hazardous) Regulations 2015 (S.I. No. 233 of 2015) as amended.
- Environmental Protection Agency 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.

2.5 Responsibilities of the Waste Producer

The waste producer is responsible for waste from the time it is generated through until its legal disposal (including its method of disposal.) Waste contractors will be employed to physically transport waste to the final waste disposal / recovery site.

It is therefore imperative that the residents, commercial tenants, and the proposed facilities management company undertake on-site management of waste in accordance with all legal requirements and employ suitably permitted/licenced contractors to undertake off-site management of their waste in accordance with all legal requirements. This includes the requirement that a waste contactor handle, transport, and reuse/recover/recycle/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* as amended or a waste or IED (Industrial Emissions Directive) license granted by the EPA. The COR/permit/license 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.

2.6 Wicklow County Council Waste Management Byelaws

The *Wicklow County Council Waste Management (Segregation, Storage and Presentation of Household and Commercial Waste) Byelaws 2018* were entered into force on the 1st day of March 2019. The byelaws set a number of enforceable requirements on waste holders with regard to storage, separation, and presentation of waste within the WCC functional area. Key requirements under these byelaws of relevance to the development include the following:

1. Obligation to Participate in a Waste Collection Service
2. Maintenance and Management of Waste Containers
3. Location for container storage
4. Use of Waste Containers on Collection Day
5. Collection Times and Container Removal
6. Prohibited Waste Types
7. Segregation of Household Waste, Contamination Prevention and Extending Food Waste Collection
8. Additional Provisions for Householders not availing of a Kerbside Collection Service
9. Provisions affecting Multi-user Buildings, Apartment Blocks, etc.
10. Interference with Orderly Waste Collection
11. Additional Provisions for Commercial Waste
12. Enforcement Provisions/Fixed Payment Notices

2.7 Regional Waste Management Service Providers & Facilities

Various contractors offer waste collection services for the residential and commercial sector in the Wicklow County Council. Details of waste collection permits (granted, pending, and withdrawn) for the region are available from the NWCPO.

As outlined in the new regional waste management plan, there is a decreasing number of landfills available in the region. Only three municipal solid waste landfills remain operational and are all operated by the private sector. There are a number of other licensed and permitted facilities in operation in the region including waste transfer stations, hazardous waste facilities and integrated waste management facilities.

A copy of all CORs and waste permits issued by the Local Authorities are available from the NWCPO website and all waste/IED licenses issued are available from the EPA. Additionally, textiles and other bulky wastes can be brought to local bring banks or recycling centres. These can be utilised by the residents of the development for other household waste streams.

3.0 DESCRIPTION OF THE PROJECT

3.1 Location, Size and Scale of the Development

Certain Assets of Dawnhill and Windhill Limited, intend to apply for permission for a Large-Scale residential development on a c.25.07ha on "Lands at Kilbride", Arklow, Co. Wicklow. The site is generally bounded by the town marsh to the south, M11 to the west, housing at Avondale Crescent/ Murrell Drive and St Joseph's School to the east and the Kilbride Industrial estate and Kilbride Road L-6179 to the north.

The development will consist of 666 no. residential units comprising 578 no. 1-2 storey housing (100 no. 2 beds, 317 no. 3 beds, 161 no. 4 beds) and 88 no. apartments and duplex apartments (24 no. 1 beds, 51 no. 2 beds and 13 no. 3 beds. All residential units will have associated private open space facing north/ south/ east/ west.

The proposal will also include a local centre comprising a creche (c.1095sqm), 3 no. community/medical units, and 3 no. retail units (along with the apartments). Building heights will range from one to five storeys.

Part of the new regional road is also proposed connecting to the Kilbride Road, and the new access road provided by the "Kilbride Education Campus" along with upgrade works to the Kilbride Road L6179. A boardwalk will be provided across the Arklow town marsh and Avoca River connecting the site to Arklow town.

All associated site development works, site reprofiling, services provision, infrastructural and drainage works, surface water attenuation and natural attenuation systems, connection to public services and utilities, provision of ESB substation, bin stores bicycle stores, car parking, public lighting, landscaping, public and communal open spaces and boundary treatment works.

This development will form part of larger / future phase of development of the Action Area Plan AAP3.

	Number of Units		
	Apartments	**Houses**	**Total**
1-Bed	24	-	24
2-Bed	51	100	151
3-Bed	13	317	330
4-Bed	-	161	161
Total	**88**	**578**	**666**

Table 1.0 Residential Development Unit Mix

Non-Residential Floor Areas	Total Floor Area (m^2)
Crèche	1,095
Community/Medical Units	450
Retail	790
Total	**2,335**

Table 2.0 Mixed Development Details Non-Residential Floor Areas

3.2 Typical Waste Categories

The predicted waste types that will be generated at the proposed development include the following:

- **Dry Mixed Recyclables (DMR**) – includes Newspaper / General paper Magazines, Cardboard Packaging, Drink (Aluminum) Cans, Washed Food (Steel/Tin) Cans, Washed Tetra-Pak Milk & Juice Cartons, Plastic Bottles (Mineral/Milk/Juice/Shampoo/Detergents), Rigid Plastics. (Pots/Tubs/Trays*)
- **Mixed Non-Recyclables (MNR) / All General Waste** – Nappies, soiled food, packaging, old candles, plasters, vacuum cleaner contents, broken delph, contaminated plastics.
- **Organic (food) Waste** – Bread, pasta and rice, Meat, fish, poultry bones, out of date food (no plastic packaging), Tea Bags, Coffee grounds and paper filters**.** Fruit and vegetables (cooked and uncooked). Food soiled cardboard or paper (no coated paper) Eggs and dairy products (no plastic packaging) Paper napkin and paper towels
- **Glass**

In addition to the typical waste materials that will be generated on a daily basis, there will be some additional waste types generated in small quantities that will need to be managed separately including:

- Green/garden waste - may be generated from internal plants and external landscaping.
- Textiles
- Batteries
- Waste electrical and electronic equipment (WEEE)
- Chemicals (solvents, pesticides, paints, adhesives, resins, detergents, etc.)
- Furniture (and from time-to-time other bulky wastes)

Wastes should be segregated into the above waste types to ensure compliance with waste legislation and guidance while maximising the re-use, recycling, and recovery of waste with diversion from landfill wherever possible.

3.3 European Waste Codes

Under the classification system, different types of wastes are fully defined by a code. The List of Waste (LoW) code (also referred to as European Waste Code or EWC) for typical waste materials expected to be generated during the operation of the proposed development are provided in the Table below 3.0.

Waste Material	LoW Code
Paper and Cardboard	20 01 01
Plastic	20 01 39
Metals	20 01 40
Mixed Municipal Waste	20 03 01
Glass	20 01 02
Biodegradable Kitchen Waste	20 01 08
Oils and Fats	20 01 25/26*
Biodegradable garden and park wastes	20 02 01
Textiles	20 01 11
Batteries and accumulators*	20 01 33*-34
Printer Toner / Cartridges*	20 01 27* -28
Green Waste	20 02 01
Waste electrical and electronic equipment*	20 01 35*-36
Chemicals (solvents, pesticides, paints & adhesives, detergents etc) *	20 01 13 / 19 /27 / 28 / 29* 30
Fluorescent tubes and other mercury containing waste*	20 01 21*
Bulky wastes	20 03 07

Table 3.0 LoW Code

3.4 Methodology

3.4.1 Residential Calculation Methodology

Waste arisings were calculated in accordance with BS 5906:2005 and included a provision of 5 litres (L) of food waste per residential unit per week. These guidelines determine the minimum capacity for waste storage space to be allocated and are as follows:

- 30 litres (L) per unit + 70L per bedroom (see Table 4.0 for further details).
- Split 50:50 between DMR and residual waste; and
- 5L per residential unit for food waste.

Number of Bedrooms	Weekly Waste Arisings per Unit (L)			
	DMR	Food Waste	MNR	Total
1 Bedroom	50	5	50	**105**
2 Bedrooms	85	5	85	**175**
3 Bedrooms	120	5	120	**245**
4 Bedrooms	155	5	155	**315**

Table 4.0 Weekly Waste Arisings Methodology

3.4.2 Commercial Calculation Methodology

BS 5906:2005 provides a methodology for the calculation of waste arisings from communal areas and crèche. These calculation methodologies are outlined within Table 5.0 of this Strategy.

Land Use Class	Waste Storage Requirements	Waste Stream Ratios
Crèche	10L per m^2 NIA	50: 50 DMR: Residual
Retail /Commercial	10L per m2 Sales Floor Area (SFA)	MDR: Food: Residual 50:30:20
Community/Amenity Space	5L per m2 NIA	50: 50

Table 5.0 Commercial Waste Arising Calculations (Weekly)

4.0 ESTIMATED WASTE ARISING

The estimated quantum/volume of waste that will be generated from the residential units is based on BS 5906:2005. The waste generation for the Residential units is based on waste generation rates per m² of floor area for the proposed area uses.

The estimated quantum/volume of waste that will be generated from the residential units has been determined based on the predicted occupancy of the units and is presented in table 6.0 below.

Waste type	Apartments	Houses	Totals (L)
Organic Waste	440	2,890	3,330
Dry Mixed Recyclables	7,095	71,495	78,590
Glass	440	2,890	3,330
Mixed Non-Recyclables	7,095	71,495	78,590
Total	**15,070**	**148,770**	**163,840**

Table 6.0 Residential Waste Prediction (L/per week)

Non-Residential Floor Areas	Area (Sq.m)	Area (sq.) GIA	Area (sq.) (NIA)	DMR Recycling	Food Waste	MNR Residual	Glass	Total (L)
Crèche	1,095	1007.4	843.15	4215.75	10	4215.75	5	**8,446.5**
Retail	790	726.8	608.30	6083.00	5	6083.00	5	**12,176**
Community/ Medical Units	450	414.0	346.50	1732.50	5	1732.50	5	**3,475**

Table 7.0 Commercial Waste Predictions (L/per week)

4.1 Waste Storage and Collection

This section provides information on how waste generated within the development will be stored and how the waste will be collected from the development. This has been prepared with due consideration of the proposed site layout as well as best practice standards, local and national waste management requirements including those of Wicklow County Council. Consideration has been given to the following documents:

- BS 5906:2005 Waste Management in Buildings – Code of Practice.
- The Eastern Midlands Region Waste Management Plan 2015 – 2021.
- Wicklow County Council, *Presentation and Storage of Waste Byelaws* (2018).
- DoEHLG, Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities (2018).

4.2 Residential Waste and Recycling Management and Storage Strategy

It is required that space be provided for recycling bins to accommodate 50% of the total weekly volume. This is in line with the BS5906:2005 requirements. Residual waste (MNR) is required for 87.5% of the total weekly arising. For the purpose of the strategy Glass and Organic Waste is required for 87.5% of the total weekly arising.

Block	Number of Bins Required for a Weekly Collection			
	MNR	Organic	DMR	Glass
Houses	1 x 240L	1 x 240L	1 x 240L	1 x 240L
Apartments	7 x 1100L	2 x 240L	7 x 1100L	2 x 240L

Table 8.0 Residential Storage Requirements

Location	Number of Bins Required for a Bi - Weekly Collection			
	MNR	Organic	DMR	Glass
Crèche	4 x 1100L	1 x 240L	4 x 1100L	1 x 240L
Retail	6 x 1100L	1 x 240 L	6 x 1100L	1 x 240 L
Community/ Medical Units	1 x 1100 L	1 x 240 L	1 x 1100 L	1 x 240 L

Table 9.0 Commercial Requirements

4.2.1 Apartments

Residents will be expected to take all waste arisings from their units to the appropriate residential waste storage area. Residents will be required to segregate their waste into the following waste categories within their own apartment units:

- DMR.
- MNR.
- Organic waste; and
- Glass.

The residents from Block 1 will bring their waste and recycling to the waste storage areas located on ground level as per figure 1.0 and place the waste and recycling into the appropriate bins. The residents from Block 2 will bring their waste and recycling to the waste storage areas located on Lower ground level as per figure 2.0 and place the waste and recycling into the appropriate bins.

It is recommended that the WSAs will have secure access with either key or fob to ensure only residents may place waste in the WSA and for the control of potential fly-tipping and vermin.

On collection day, the bins will be brought from the bin store to the waste collection point by the management company personnel. Once the bins are emptied the bins will be brought back down to the waste storage area.

Figure 1.0: Waste Storage Area – Block 1 Residents

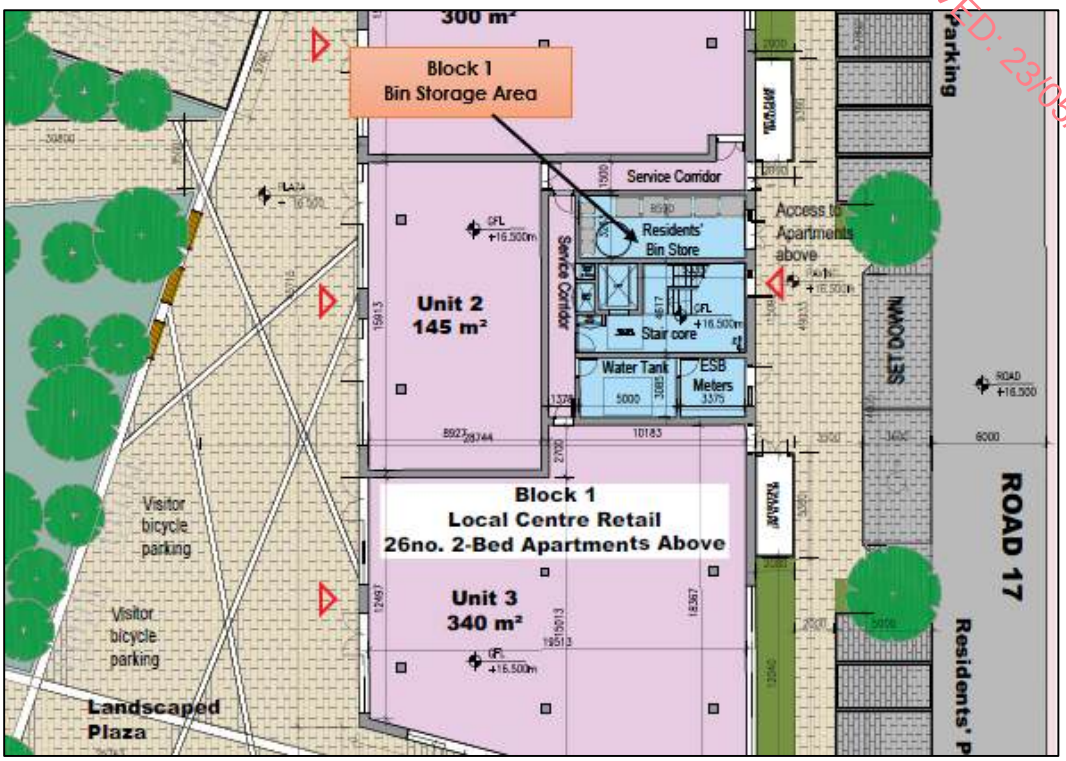
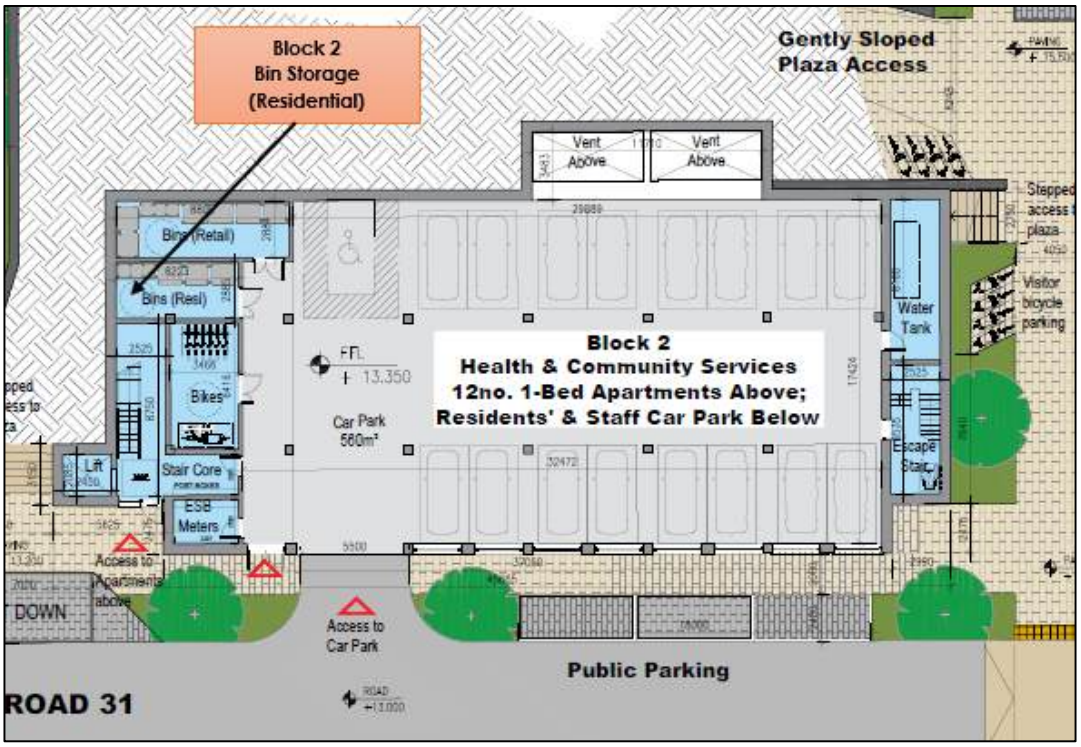


Figure 2.0: Waste Storage Area – Block 2 Residents and Retail



4.2.2 Houses

Residential houses will have a typical three/four bin system per house which will be separate to the waste storage areas discussed above in Section 3.0-3.2. Residents will be required to segregate their waste into the following waste categories within their own houses:

- DMR.
- MNR.
- Organic waste; and
- Glass.

It is anticipated that residents in houses will have a dedicated shielded area for storage of the wheelie bins at the front of each property.

Figure 3.0 Bin Storage design at Houses (Character 1A)

Figure 3.1: Bin Storage design at Houses (Character 1B&1C)

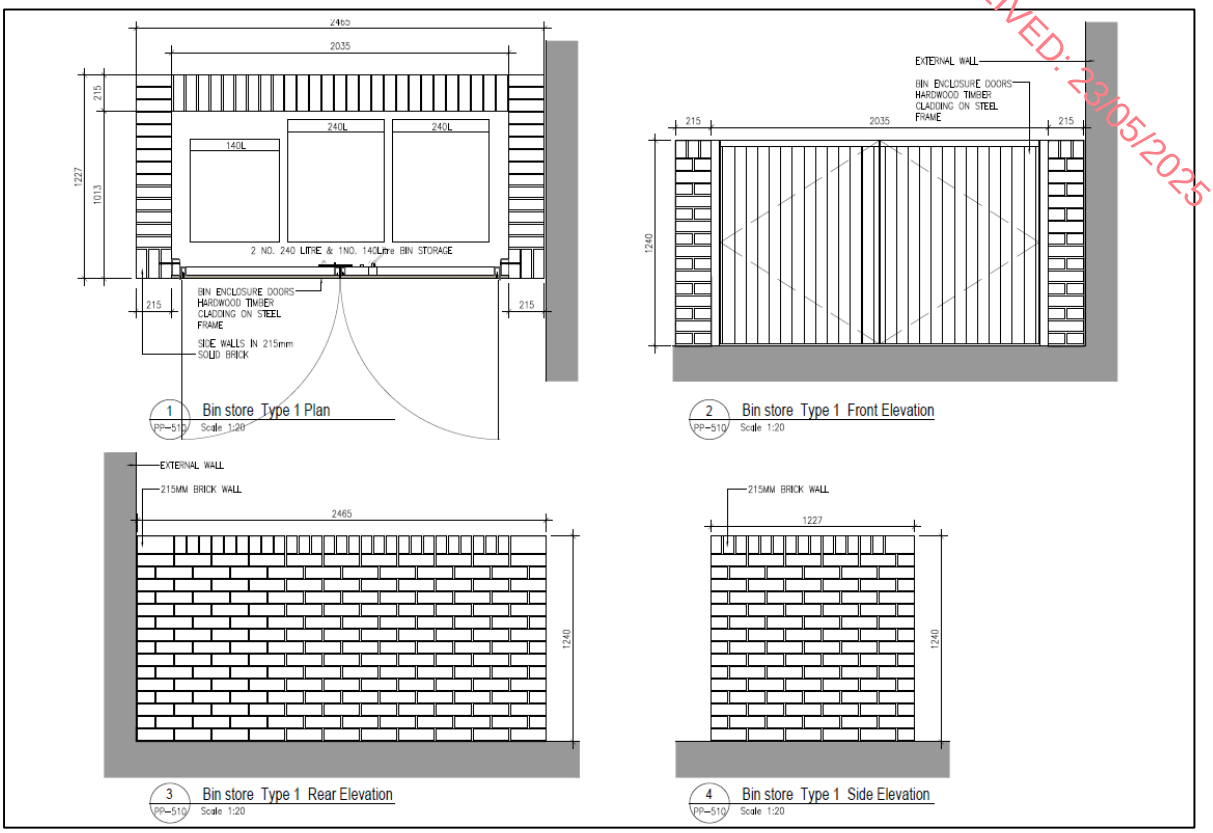
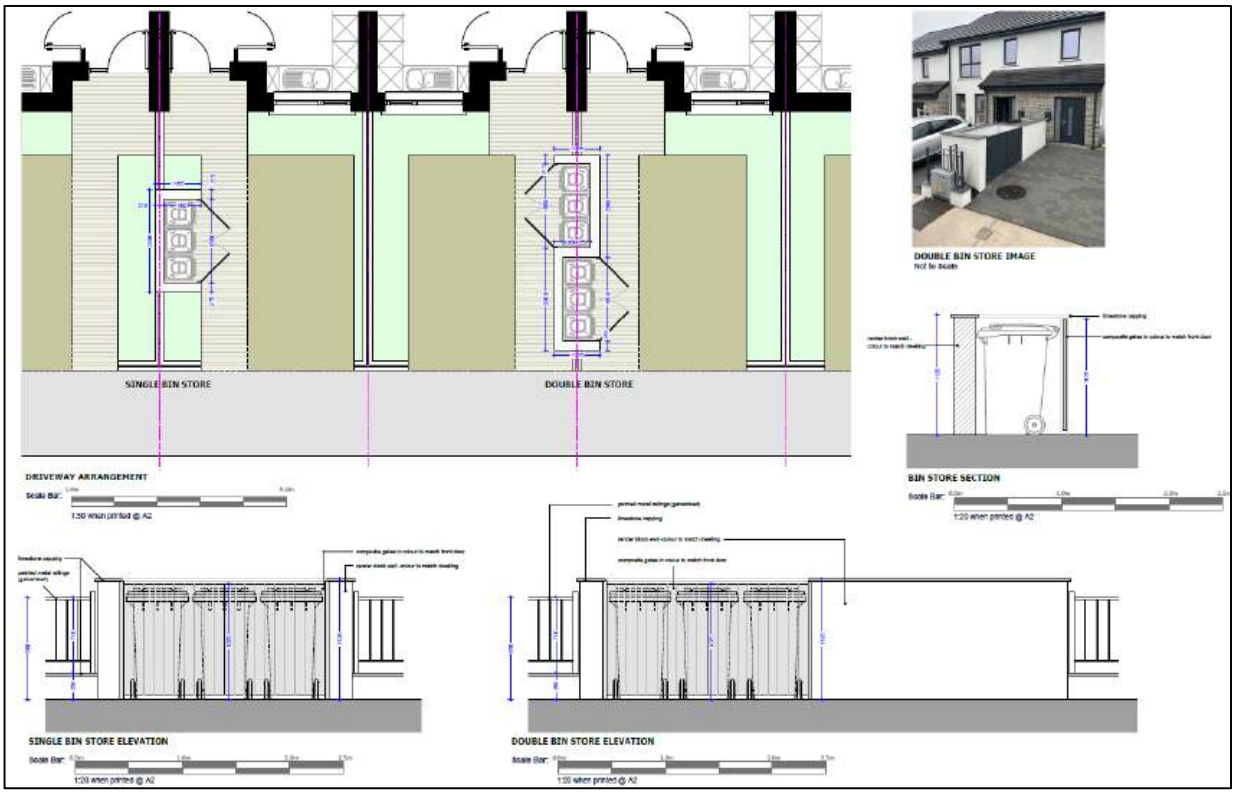


Figure 3.2: Bin Storage design at Houses (Character 1D)



4.2.3 Waste Storage – Crèche / Non-Residential Units

The Crèche/ Non-Residential Units will be required to segregate their waste into the following waste categories within their own unit:

- DMR.
- MNR.
- Organic waste; and
- Glass

As required, the staff will need to bring segregated DMR, MNR, Organic and Glass waste to the dedicated WSA located on ground level as shown in Figure 4.0 below and Figure 5.0. All bin/containers should be clearly labelled, and colour coded to avoid cross contamination of the different waste streams. Signage should be posted on or above the bins to show which wastes can be put in each bin. Suppliers for the non-residential units should be requested by the tenants to make deliveries in reusable containers, minimize packaging or to remove any packaging after delivery where possible, to reduce waste generated by the development.

Waste materials such as batteries, WEEE and printer toner/cartridges may be generated within the units, but it is anticipated that they will be generated infrequently (if they do arise). Temporary storage areas may be identified within the units for these items pending collection by an authorised waste contractor.

Figure 4.0: Non-Residential Units Block 2

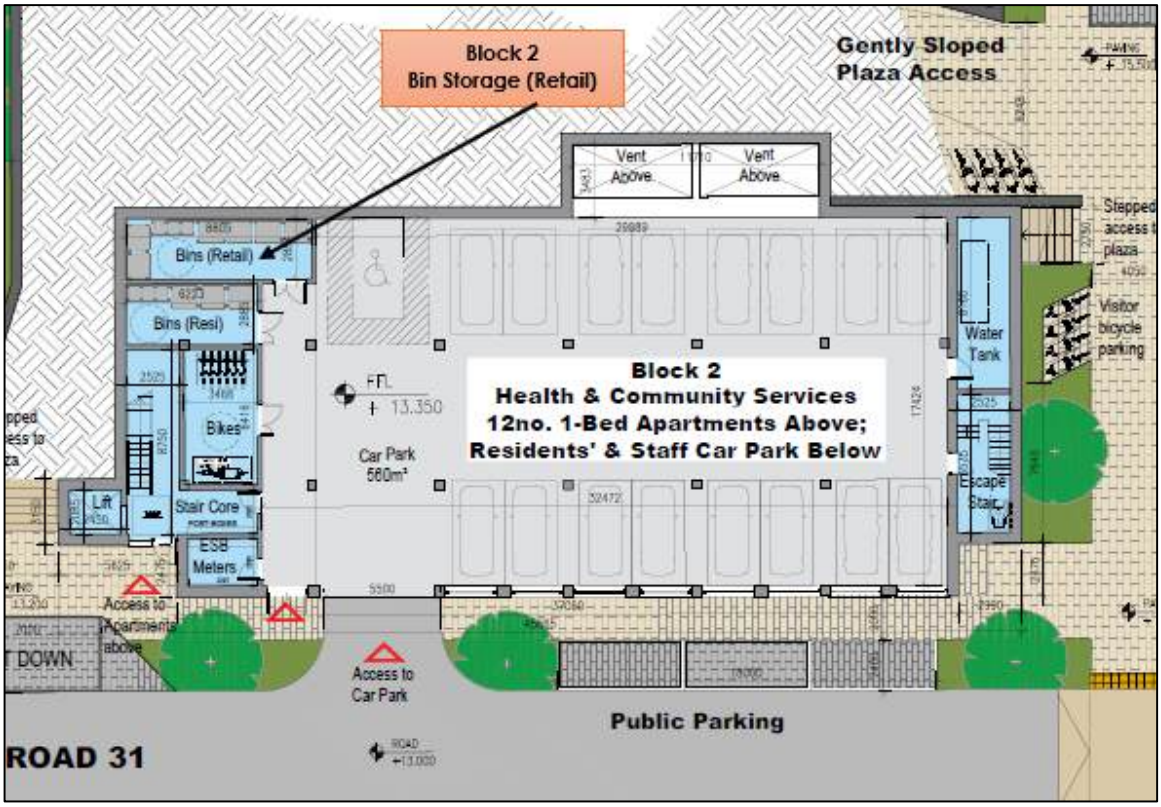
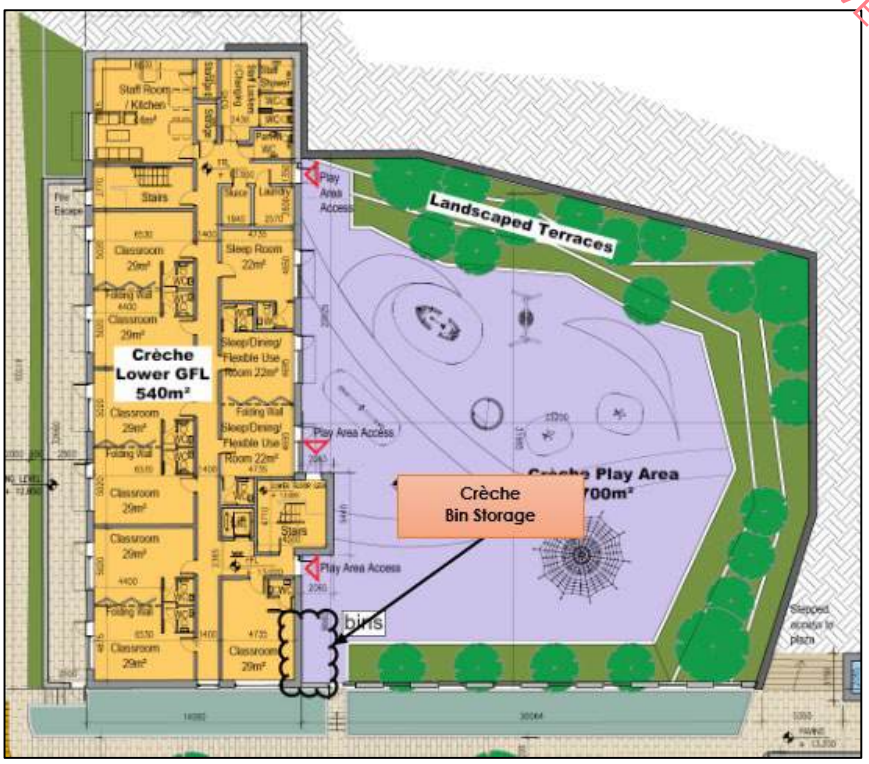


Figure 5.0: Waste Storage Area – Crèche



4.3 Waste Storage Residential Units

Provision is made for the segregation and storage of domestic waste within each unit. Each unit is provided with bins in the kitchen area to enable the separation of waste into different waste streams – 1.) glass, 2.) food, 3.) DMR (Dry Mixed Recycling) and 4.) general waste (MNR). Sample images of bin types in each unit below.

4.3.1 Waste Storage Medical Units

Storage Units for Healthcare Typical Wastes

Waste Bunker	Health risk waste wheeled-bin
	
1200w x 600d X 850h mm	**Storage Capacity 770l** **Dimensions: 785w x 1260d x 1370h mm**

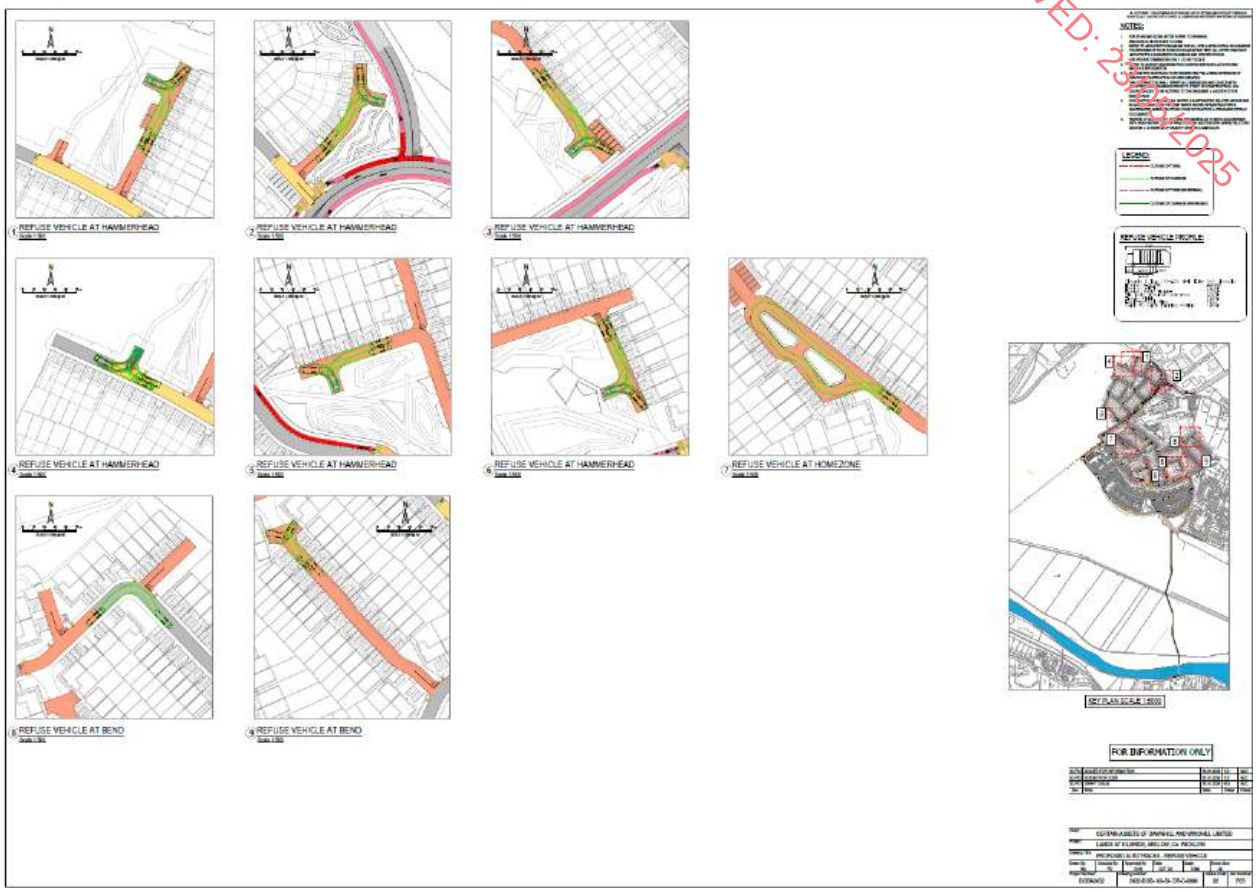
4.4 Waste Collection Contractors

There are numerous private contractors that provide waste collection services in the Wicklow area who hold a valid waste collection permit for the specific waste types collected. All waste collected must be transported to registered/permitted/licensed facilities only.

All waste requiring collection by the appointed waste contractor will be collected from the WSAs by nominated waste contractors or facilities management depending on the agreement and will be brought to the temporary waste collection areas. The empty bins will be promptly returned to the appropriate WSAs. Figure 6 displays the Autotrack drawing for the site.

All waste receptacles presented for collection will be clearly identified as required by waste legislation and the requirements of the Wicklow County Council Byelaws. Also, waste will be presented for collection in a manner that will not endanger health, create a risk to traffic, harm the environment or create a nuisance through odours or litter.

Figure 6.0 Proposed Autotrack



4.5 Additional Waste Materials

There is likely to be a small component of the overall waste arisings from the Proposed Development that will comprise other waste streams, such as WEEE, printer and toner cartridges, and fluorescent light tubes. Building maintenance will also give rise to materials such as paints and will be the responsibility of the management company to dispose of this waste.

4.5.1 Hazardous Waste Collection

Under agreed international rules for the transportation of all types of Hazardous Goods for the different modes of transport. There are specific requirements for the classification, packaging, labelling and documentation of hazardous goods as well as the training of personnel involved in the transport of such dangerous goods. The two classes of dangerous substances which are specifically relevant to waste healthcare are Class 6.1-toxic substance and Class 6.2-infectious substances. Legislation requires that safety adviser (SA) be appointed to oversee all the necessary requirements when transporting Dangerous

Goods. The duties of a SA are outlined as follows:

a) monitoring compliance with the rules governing the transport of hazardous goods.

b) advising the undertaking on the transport of hazardous goods.

c) ensuring that an annual report to the undertaking is prepared on the activities of the undertaking concerning the transport of hazardous goods.

d) monitoring the following practices and procedures relating to the activities of the undertaking which concerns the transport of hazardous goods.

4.6 Waste Storage Area Design

This area will be installed in accordance with BS 5906:2005.

- The walls and roofs of the bin stores will be formed of non-combustible, robust, secure, and impervious material, and have a fire resistance of one hour. The enclosures will be suitably designed to prevent entry by vermin.
- All containers for waste, including recyclable material, will be easily accessible to both the occupier and waste collector.
- Waste stores will be designed and located in such a way as to limit potential noise disturbance to residents.
- Storage areas for waste and DMR will be clearly designated for this use only, by a suitable door or wall sign and, where appropriate, with floor markings.
- Waste storage sites will include areas for instructional signage detailing correct use of the facilities.
- Have access for potential control of vermin, if required.
- The entrance of the waste storage room will be free from steps and projections.
- Where the area is to be enclosed in a roofed building, adequate ventilation will be provided. Permanent ventilators will be provided giving a total ventilation area of not less than 0.2m^2;
- Contain electrical lighting by means of sealed bulkhead fittings (housings rated to IP65 in BS EN 60529:199 for the purpose of cleaning down with hoses and inevitable splashing. Luminaires will be low energy light fittings or low energy lamp bulbs, controlled by proximity detection or a time delay button to prevent lights being left on; and
- Gullies for wash down facilities will be positioned so as not to be in the track of container trolley wheels.

In addition to the above requirements, experience, and best practice for the storage of waste materials will include the following provisions:

- Waste storage facilities will not block any utility service points.
- Waste storage areas will not obstruct sight lines for pedestrians, drivers, and cyclists, if doors open outwards, they will not open onto a road or highway.
- Waste containers will be inside or at least enclosed. If bins are outside, they will be secured in a compound; Information packs will be provided to residents to include full information on available recycling facilities.
- Colour coding will be used for bins of different streams; and any internal storage areas adjacent to a fire escape route will be fitted with fire doors, automatic fire detection and a sprinkler system and comply with the Building Regs.
- The facilities management company will be required to maintain the bins and their WSAs in good condition. All residents should be made aware of the waste segregation requirements and waste storage arrangements.

4.6.1 Colour Coding for Bins (Recommended)

The first level of segregation involves the division of healthcare waste into risk and non-risk waste. Risk waste is classified as Dangerous Goods under ADR requirements; therefore, the Medical Waste packaging must be UN Approved. Two different types of packaging are used for healthcare risk waste, bags and rigid containers. Yellow plastic bags should not be used for

sharp or breakable items or for liquids. There are no particular packaging and segregation requirements for non- risk waste but segregation where possible to meet the requirements of recycling schemes should be completed. Non-risk waste is usually packaged in black or transparent bags. However transparent bags provide for ease of identification of waste types and prevent cross-contamination with risk waste.

- Yellow (yellow) lids should be used with containers for disposal by non-incineration, disinfection technology.
- Red (red) or blue (blue) lids are sometimes used by manufacturers to distinguish sharps containers and are also acceptable for alternative technology disposal (but see note re containers for un-regulated medicinal wastes in 6.4.1.3).

- Purple (purple) or black (black) lids are reserved for containers intended principally for disposal by incineration.
- Purple (purple) lids are recommended for bins or boxes with healthcare risk waste contaminated with cytotoxic materials discarded medicines or pharmaceuticals.
- Black (black) lids are recommended for containers used for the disposal of recognisable large anatomical waste material or body parts, including placentas. Such containers may also be used for other materials which are not suitable for disposal by alternative technology and for which the proper disposal method is deemed to be incineration.

4.6.2 Position of Bins for Health Care Risk Waste

<table>
<tr><td colspan="2"></td><td>Good practice in provision of bins:</td></tr>
<tr><td>  </td><td>  </td><td>HCRW bin positioned away from hand wash sink (left); small HCRW bin used in area with small level of healthcare risk waste generation (right).

DO place the HCRW bin:
Next to a general landfill waste or recycling bin. Staff have to make a decision on which bin to use. Make sure to place the general landfill or recycling bin closer to the main source of waste generation.</td></tr>
<tr><td colspan="2"></td><td>Bad practice in provision of bins:</td></tr>
<tr><td>  </td><td>  </td><td>Clockwise from top left: HCRW bin used as a doorstop; HCRW bin nearest hand wash sink; HCRW bin in multi-bed public access ward.

DO NOT place the HCRW bin:
Next to a hand wash sink as paper towels are usually thrown into the nearest bin, whether it is the correct bin or not. Place a general landfill bin or recycling bin next to the sink instead.</td></tr>
<tr><td colspan="2">  </td><td>Near the entrance to a room, especially where the door is continually open - it may be used by someone in the corridor. This does not apply in an isolation room, where the bin is used for the collection of PPE (gloves, gowns, aprons, etc).
For similar reasons do not use a HCRW bin as a door stop. If retained in publicly accessible areas e.g. multi bedrooms, do not place within easy access of patient beds. Patients and visitors will generally place waste into the nearest bin.</td></tr>
</table>

4.6.3 Segregation & Packaging of Healthcare Risk and Non-risk wastes.

5.0 Waste Collection Requirements

In line with BS 5906:2005 and Wicklow County Council Bye Laws 2018 guidance, the following collection requirements have been designed into the Proposed Development in order to comply with all mandatory waste storage requirements:

5.1 BS 5906 2005

All paths used to transport bins from the storage area to the collection point will have a minimum width of 2m, be free from kerbs or steps, have a solid foundation and be finished with a smooth, continuous finish. Based on the clearance height and tonnage specified by the dimensions of a standard waste collection vehicle have been used to undertake the swept path analysis.

Dimensions	
Width	2.53 metres
Gross vehicle weight	26 tonnes
Length	11.2 metres
Clearance Height	4.75m (Any part of a building through which a waste collection vehicle passes must have a minimum clear height of 4.75 m, to allow for overhead fixtures and fittings)
Turning Circle (diameter)	9.5 metres

Table 10.0 Collection Vehicle Dimensions: Waste/Recycling Collection Vehicle

6.0 CONCLUSIONS

The Proposed Development will be achieved with high standards of waste management performance. As such, due consideration has been given to waste which will be generated by the Proposed Development during its operation. Waste management within the Proposed Development has the following aims:

- To contribute towards achieving current and long-term government, Wicklow County Council and EMR targets for waste minimisation, recycling, and reuse.
- To ensure that all legal requirements for the handling and management of waste during the operation of the Proposed Development are complied with; and
- To provide tenants with convenient, clean, and efficient waste management systems that enhance the operation of the buildings and promote high levels of recycling.

Residential waste storage allows for a weekly (seven day) storage capacity for DMR, food and MNR (i.e., nonrecyclable). In summary, this OWRMP presents a waste strategy that complies with all legal requirements, waste policies and best practice guidelines and demonstrates that the required storage areas have been incorporated into the design of the development.