Proposed SHD – Lands at Central Mental Hospital, Dundrum, Dublin 14

Client: Land Development Agency

Traffic & Transport Assessment & Mobility Management Plan

PROPOSED SHD, LANDS AT CENTRAL MENTAL HOSPITAL, DUNDRUM, DUBLIN 14

Description:

Traffic & Transport Assessment & Mobility Management Plan

Authors:

Ben Waite, Senior Transportation Analyst

Christy O'Sullivan, Managing Director, ILTP

Approved By:

Christy O'Sullivan

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Distribution:

Reddy Architecture & Urbanism
Tom Phillip & Associates

ILTP
Head Office:
St. Albert's House
Dunboyne
Co. Meath
tel: 01-8255700
fax: 01-8255730
info@iltp.ie
www.iltp.ie

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1 INTRODUCTION

1.1 Background

1.1.1 ILTP Consulting were commissioned by Reddy Architecture on behalf of the Land Development Agency (LDA) to undertake a new Traffic and Transport Assessment (TTA) for a Proposed Strategic Housing Development (SHD) on the Central Mental Hospital site Dundrum and the associated masterplan prepared for the overall lands.

1.1.2 The overall masterplan lands include for additional residential development and an enterprise centre, which will also use the same accesses as those proposed in the SHD and will be the subject of a separate planning application. Therefore, the overall access arrangements were tested assuming the full development of the entire client lands to provide a holistic picture of the overall masterplan lands.

1.2 Purpose of Report

1.2.1 The primary purpose of this TTA is to assess the potential impact the proposed development may have on the surrounding road network and to identify measures to mitigate these impacts and promote sustainable transport patterns.

1.2.2 This Traffic & Transport Assessment sets out to assess:

- Existing traffic conditions
- Integration with adjoining developments and surrounding area
- Public transport provisions
- Proposed access arrangements for the development
- Proposed parking arrangements
- Effect on road network of increased traffic volumes from proposed development

1.2.3 The report also assesses the Construction Traffic Impact of the proposed development.

1.3 Methodology

1.3.1 In order to assess the traffic impact of the proposed development, it was first necessary to assess the current traffic situation in the area. Several site visits were undertaken by ILTP outside the perimeter walls of the site, most recently in October and November 2021. Traffic count data was obtained in the environs of the proposed development to determine traffic flows in February 2019 and November 2021 so that the pre - Covid as well as up to date traffic data could be compared and assessed.

1.3.2 ILTP calculated the estimated trip rates from the proposed development and added these figures to the opening year flows. A Picady analysis was also undertaken to assess the capacity of the proposed access onto Dundrum Road. LinSig Traffic Signal Junction modelling software was also utilised to assess the capacity of adjacent signalised junctions on the surrounding road network with the proposed development in place.

1.3.3 ILTP then assessed what impact the development had on the road network based on the traffic data.

1.3.4 An assessment of public transport provisions in the area was also carried out to determine the capacity and likely usage of public transport services in the new development.

1.3.5 As part of this TTA, ILTP have included a Mobility Management Plan (MMP) for the proposed CMH SHD application, with the specific objectives of reducing in overall terms both the amount of trips generated by the development, and ensuring that greater numbers use sustainable travel modes and the extensive public transport services in the immediate area. The potential mitigation impacts of these measures are also set out in this report.

1.3.6 ILTP also assessed the Construction Stage traffic impact of the proposed CMH SHD development on the wider road network in this report.

1.3.7 This TTA also takes into consideration the opinion of An Bord Pleanála and issues raised by Dun Laoghaire Rathdown County Council (DLR) as outlined as part of the pre-planning process.

1.4 Consultations and Meetings

1.4.1 ILTP Consulting took part in a variety of consultations via MS Team with various residential associations, elected representatives and DLR planning as part of the pre-planning consultation process. In addition, ILTP participated in the Tri-Partite meeting with An Bord Pleanála. A further meeting with the National Transport Authority (NTA) and DLR Road and Transport section was held on the 14th January 2022. The purpose of the meeting was to discuss the proposed changes to the overall scheme and to ensure that the proposed development was consistent with the overall transport planning for the area.

1.5 Report Structure

1.5.1 Chapter 2 sets out the transport planning policy context for the proposed development.

1.5.2 Chapter 3 describes in proposed CMH site residential development and study area.

1.5.3 Chapter 4 presents a description of proposed access arrangements for the development and assesses the public transport facilities in the area.

1.5.4 Chapter 5 assesses car and cycle parking provision and arrangements.

1.5.5 Chapters 6 and 7 set out Trip Generation and Trip Distribution figures for the development.

1.5.6 Chapter 8 presents the Traffic and Transport Assessment and results.

1.5.7 Chapters 9 and 10 contain the Mobility Management Plan

1.5.8 Chapter 11 includes the Construction Traffic Impact Assessment for the development.

1.5.9 Chapter 12 presents a summary of the responses to the Board's opinion along with the issues raised by DLR.

1.5.10 Chapters 13 presents the summary and conclusions of the report.

1.5.11 The Quality Audit and DMURS Compatibility Statement are included as separate reports. The overall detailed design of the road and street network is included in the separate engineering and other reports and drawings accompanying the application.

2 TRANSPORT PLANNING, POLICY CONTEXT AND TRENDS

2.1 Overview

2.1.1 This study is being prepared having regard to key policy documents at national, regional and local levels, particularly:

- Project Ireland 2040 - National Planning Framework
- National Development Plan 2021 - 2030 (NDP)
- National Climate Action Plan 2021 (NCAP)
- National Investment Framework for Land Transport 2021 (NIFTI)
- The Urban Development and Building Height Guidelines (2018)
- Smarter Travel A Sustainable Transport Future
- National Cycle Policy Framework 2009 – 2020
- The Transport Strategy for the GDA (NTA) 2016 – 2035
- Draft Transport Strategy for the GDA (NTA) 2022 – 2042
- GDA Planned Cycle Network (NTA)
- Get Ireland Active - The National Physical Activity Plan (NPAP)
- Design Manual for Urban Roads and Streets (DMURS)
- Sustainable Urban Housing: Design Standards for New Apartments - Guidelines for Planning Authorities 2020
- Regional Spatial & Economic Strategies (RSES)
- Dun Laoghaire Rathdown County Council Development Plan
- Area Based Travel Plans

2.1.2 This section also includes a brief review of the recent planning history for the subject lands and adjoining lands.

2.2 Project Ireland 2040 – National Planning Framework and RSES

2.2.1 The *Project Ireland 2040 - National Planning Framework* (NPF) recognises that improvements in connectivity are achievable and are necessary to boost both competitiveness and quality of life. The Ireland 2040 Vision includes the following key elements which have direct relevance to mobility management measure proposed.

- More sustainable choices and options for people, businesses and communities that can positively influence sustainable patterns of living and working.
- The highest possible quality of life for our people and communities, underpinned by high quality, well managed built and natural environments.

- Significant improvement in local and international connectivity that underpins the competitiveness and quality of life of our people, businesses, communities and regions.

2.2.2 The NPF has been developed to deliver the following National Strategic Outcomes (as part of the Smart Growth Urban Initiative to achieve sustainable growth) which are pertinent to this report. These are to:

- Improve accessibility to and between centres of mass and scale and provide better integration with their surrounding areas.
- Ensure transition to more sustainable modes of travel (walking, cycling, public transport) and energy consumption (efficiency, renewables) within an urban context.

2.2.3 The NPF seeks to enable people to live closer to where they work, moving away from the current unsustainable trends of increased commuting. It supports more energy-efficient development through the location of housing and employment along public transport corridors, where people can choose to use less energy-intensive public transport, rather than being dependent on the car.

2.2.4 The Eastern and Midland Regional Assembly (EMRA), through its "Regional Spatial and Economic Strategy", also supports sustainable travel planning. Specifically, through Regional Policy Objective (RPO) 8.7 which promotes the use of mobility management to bring about behaviour change and more sustainable transport use.

2.3 National Development Plan

2.3.1 The National Development Plan 2021 - 2030 (NDP) - sets out the investment plan to underpin the NPF's ten National Strategic Outcomes.

2.4 National Climate Action Plan 2021

2.4.1 The National Climate Action Plan 2021 (NCAP) - following on from the National Mitigation Plan, the NCAP sets out actions for Ireland to achieve the level of decarbonisation required to achieve its 2030 targets for carbon emissions and creating a pathway towards achieving net-zero emissions by 2050, in line with our international commitments under the Paris Agreement. Decarbonising transport is a key tenet of the Plan, which identifies a range of actions in the following areas:

- Mode Shift
- Conversion of Public Fleet
- Incentives & Regulation
- EV Charging Network
- Use of Biofuels
- CNG Network
- Emerging Technologies
- Demand Management

2.5 The National Investment Framework for Transport in Ireland

2.5.1 The National Investment Framework for Transport in Ireland (NIFTI), published in December 2021, update the Strategic Investment Framework for Land Transport (SIFLT) and sets out the Department of Transport's framework for prioritising future investment in the land transport network to support the delivery of the National Strategic Outcomes of the National Development Plan and Climate Action Plan.

2.6 The Urban Development and Building Height Guidelines (2018)

2.6.1 These national guidelines require that increased building height can be in areas that are well served by public transport with high-capacity and high-frequency service with good links to other modes for public transport.

2.7 Smarter Travel A Sustainable Transport Future 2009-2020

2.7.1 *Smarter Travel A Sustainable Transport Future 2009-2020*, recognises the vital importance of continued investment in transport to ensure an efficient economy and continued social development, but it also sets out the necessary steps to ensure that people choose more sustainable transport modes such as walking, cycling and public transport. The policy is a response to the fact that continued growth in demand for road transport is not sustainable from a number of angles as it will lead to further congestion, further local air pollution, contribute to global warming, and result in negative impacts to health through promoting increasingly sedentary lifestyles. The aim of the policy document is to;

- Improve quality of life and accessibility to transport for all and, in particular, for people with reduced mobility and those who may experience isolation due to lack of transport.
- Improve economic competitiveness through maximising the efficiency of the transport system and alleviating congestion and infrastructural bottlenecks.
- Minimise the negative impacts of transport on the local and global environment by reducing localised air pollutants and greenhouse gas emissions.
- Reduce overall travel demand and commuting distances travelled by the private car.
- Improve security of energy supply by reducing dependency on imported fossil fuels.

2.7.2 These are to be achieved by four main actions;

- Actions to reduce the distance travelled by private car and encourage smarter travel, including focusing population growth in areas of employment and to encourage people to live in close proximity to places of employment and the use of pricing mechanisms or fiscal measures to encourage behavioural change,
- Actions aimed at ensuring that alternatives to the car are more widely available, mainly through a radically improved public transport service and through investment in cycling and walking,
- Actions aimed at improving the fuel efficiency of motorised transport through improved fleet structure, energy efficient driving and alternative technologies, and
- Actions aimed at strengthening institutional arrangements.

2.7.3 In order to ensure that the broad goals and detailed targets of the Smarter Travel document are met a series of policies and measures are recommended. These policies focus on coordinating land use and transport, the provision of high-quality public transport and high quality routes for cycling and walking, aligning employment policy with transport planning, the implementation of mobility management plans and the use of fiscal measures to influence travel behaviour. These include:

- That 10% of all trips be made by bicycle; and
- Work related commuting by car will be reduced from a current modal share of 65% to 45%.

2.7.4 Intensification of development within established urban areas served by high capacity, high quality public transport services accords with good planning and promotes sustainable transport modes.

2.8 National Cycle Policy Framework 2009 - 2020

2.8.1 The National Cycle Policy Framework 2009 - 2020 sets a mission to create a strong national cycling culture where all cities, towns, villages and rural areas will be bicycle friendly to achieve the objective that 10% of all trips will be by bike by 2020. The Framework supports the planning, development and design of towns and cities in a cycling and pedestrian friendly way, ensuing that the urban road infrastructure is designed/retrofitted so as to be cyclist-friendly. This document is likely to be updated in the near future.

2.9 National Physical Activity Plan (NPAP) – Update 2020

2.9.1 The National Physical Activity Plan (NPAP) recognizes that physical inactivity is a demonstrated clear risk to health and wellbeing in Ireland. Action Area Four of the NPAP focuses on the use of the natural and built environment as a way to build in daily physical activity. It recognizes that promoting active transport is the most practical and sustainable way to increase physical activity as part of people's everyday routine. It specifically identifies the role of walking or cycling for utility transport as a means to increase people's physical activity levels.

2.9.2 **Greater Dublin Area Transport Strategy, 2016-2035**

2.9.3 The ***Greater Dublin Area Transport Strategy, 2016-2035*** aims to contribute to the economic, social and cultural progress of the Greater Dublin Area by providing for the efficient, effective and sustainable movement of people and goods – helping to reduce modal share of car-based commuting to a maximum of 45%. To achieve these principles, future developments must:

- Have transport as a key consideration in land use planning – integration of land use and transport to reduce the need to travel, reduce the distance travelled, reduce the time taken to travel, promote walking and cycling, especially within development plans.
- Protect the capacity of the strategic road network.
- Ensure a significant reduction in share of trips taken by car, especially those trips which are shorter or commuter trips.
- Take into account all day travel demand from all groups.
- Provide alternate transport modes in order to reduce the strain on the M50 as current increase in traffic is unsustainable.

2.9.4 This strategy is currently under review by the NTA has completed a public consultation in January 2022. This strategy sets out the framework for investment in transport infrastructure and services to the year 2042 for the Greater Dublin Area. This sets new targets to increase public transport usage by 63% and an 18% reduction in vehicle kilometres trips to work.

2.10 Greater Dublin Area Transport Strategy, 2022-2042 - Consultation

2.10.1 This NTA completed a public consultation in January 2022 on what is a planned review and update of the current transport strategy. This strategy sets out the framework for investment in transport infrastructure and services to the year 2042 for the Greater Dublin Area. This sets new targets to increase public transport usage by 63% and an 18% reduction in vehicle kilometres trips to work along with increases in cycle mode share targets.

2.10.2 The review of the transport strategy also includes for a review of the cycle network in the GDA.

2.11 Design Manual for Urban Roads and Streets (DMURS)

2.11.1 The Design Manual for Urban Roads and Streets (DMURS) sets out the manner in which roads and streets in suburban areas should be designed to prioritise the needs of Pedestrians, cyclists and public transport users and reduce the dominance of the private car.

2.12 Sustainable Urban Housing: Design Standards for New Apartments - Guidelines for Planning Authorities 2020

2.12.1 These updated standards include a default policy for car parking provision to be minimised, substantially reduced or wholly eliminated in highly accessible areas coupled with a significant uptake in the quantity and quality of cycle parking provision and design.

2.13 Regional Spatial & Economic Strategies (RSES)

2.13.1 The *Regional Spatial & Economic Strategy 2019 - 2031* (RSES) for the Eastern Midlands area, aligns with the NPF in that it targets more compacted and consolidated growth in existing urban centres. The RSES sets out the following as some of the main growth enablers for the Dublin metropolitan area:

- *"To achieve growth of 1.4 million people in Dublin City and Suburbs and 1.65 million people in the Dublin Metropolitan Area by 2031*
- *To realise ambitious compact development targets at least 50% of all new homes within or contiguous to the existing built up area in Dublin and at least 30% in other metropolitan settlements*
- *To deliver identified strategic development areas along high-quality public transport corridors in tandem with the delivery of infrastructure and enabling services to ensure a steady supply of sites."*

2.13.2 The proposed SHD is within an existing well established Dublin suburban area and is strategically located in the proximity of high-quality rail and bus public transport services, so is fully consistent with the NPF and RSES policies

2.14 Dun Laoghaire Rathdown County Council Development Plan

2.14.1 The *Dun Laoghaire Rathdown County Council Development Plan* sets out the development context for the proposed development. The CDP zoning objectives for the area are shown in Figure 2.1

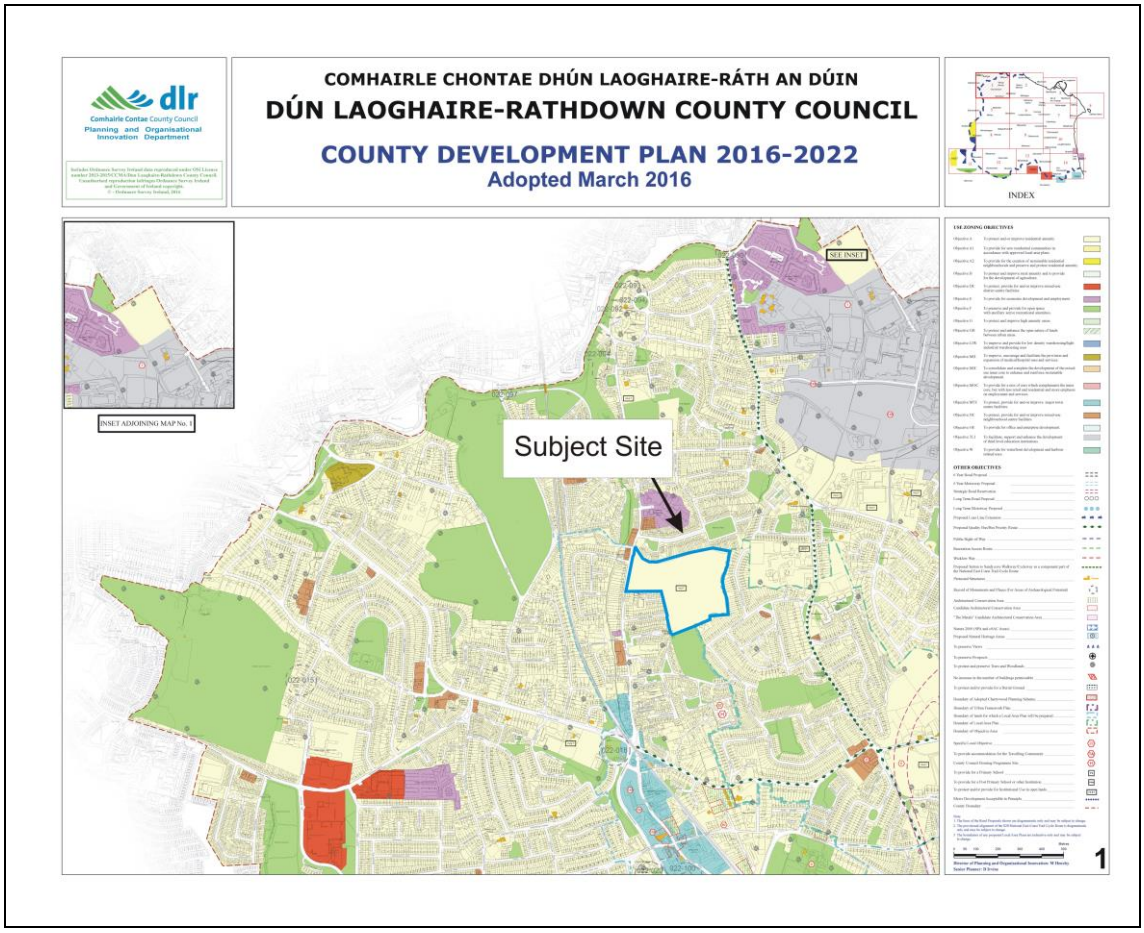


Figure 2.1: Proposed development in context of DLRCC Development Plan (Source: *Dun Laoghaire Rathdown County Council Development Plan*)

2.14.2 The subject site is zoned:

"Objective A To protect and-or improve residential amenity"

2.14.3 The proposed development lands are also subject to a specific local objective which states:

"INST - To protect and/or provide for Institutional Use in open lands"

2.14.4 These Government and Council policies and objectives reinforce the need for quality housing and related development in the close confines of existing public transport infrastructure, as is the case with the proposed development. In addition, the targeted reductions in private car mode share will serve to reduce traffic flows on the wider road network over time, particularly where high quality public transport and non-motorised alternatives are in place, as is the case in the immediate vicinity of the subject site.

2.15 Area Based Travel Plans

2.15.1 The NTA and TII issued a Guidance Note on Area Based Transport Assessment (ABTA) in 2018, and a pilot ABTA Methodology Note in 2021. The objective of the ABTA process is to develop more locally tailored plans to promote sustainable travel in particular area. DLRCC is now preparing a Local Transport Plan (LTP) for the Dundrum LAP area using the ABTA methodology, in collaboration with the NTA, as confirmed in the meeting on the 14th January 2022, (attended by representatives of ILTP, Reddy Architecture + Urbanism, LDA, NTA and DLRCC). The LTP will primarily cover the same area as the Dundrum LAP, but also includes measures and schemes in the ABTA Area of Influence (see Figure 2.2).

Figure 2.2: Dundrum Area Based Transport Assessment Study Area

2.15.2 ABTA seeks to facilitate and inform the integration of land use and transport planning, with an emphasis on enabling sustainable transport outcomes for the area at a more local level that is also consistent with national and regional policy objectives.

2.15.3 The meeting afforded the applicants design team the opportunity to set out the overall design approach and sustainable transport rationale underpinning the proposed development. The pedestrian and cycle permeability proposed as part of the SHD application was broadly welcomed by the NTA.

2.15.4 The NTA confirmed that the BusConnects project was being implemented on a phased basis and that included for increased bus service, core bus corridors and the new transport interchanges, including a planned transport interchange at Dundrum adjacent to the existing LUAS stop.

2.15.5 The NTA confirmed that there was no impediment in implementing the phased introduction of the planned new bus services in the Dundrum area and that they are being implemented on a phased basis. The new services on the Howth/Malahide and Lucan routes have already been implemented in accordance with the overall plan. The Orbital Route S6 planned bus services on R112 Taney Road to the south of the proposed development is programmed to be in place by 2024 and will operate at 15-minute intervals at peak time, further increasing bus services in the area.

2.15.6 The NTA is continuing to expand the bus fleet and is purchasing new buses to enhance its services. In addition, the NTA monitors existing bus routes and additional bus frequencies can be introduced as demand increases on particular routes.

2.16 Traffic Growth Trends and Future Year Forecasts

2.16.1 Using the NTA / DCC annual Cordon Count (*Canal Cordon Report 2018 - Report on Trends in Mode Share of Vehicles and People Crossing the Canal Cordon 2006 to 2019*, December 2020) and other data sources ILTP undertook a review of recent trends in traffic volumes for Dublin City Centre and the wider environs. The Cordon Count Report shows that in overall terms there has been a significant decline since 2006 in the number of vehicles coming into Dublin during the Cordon Count period. Car numbers crossing the canal cordon have continued to decline in recent years, with a total reduction of 20.9% between 2006 and 2019.

2.16.2 This decline in private car usage is promoted and supported by Policy objectives at National and Local level. *Smarter Travel a Sustainable Transport Future* has as its goal a shift from car dependency to more sustainable modes of transport as such future planned development will have to have a high level of sustainability. This will in turn lead to a move away from car dependency, particularly in city locations served by rail and bus public transport such as the proposed regeneration.

2.16.3 Furthermore, the *Smarter Travel* document states that:

> *"The total kilometres travelled by the car fleet in 2020 will not increase significantly from current total car kilometres."*

2.16.4 This will be particularly true for central locations and areas that are well served by public transport such as the subject lands. It is noted, that traffic levels on radial routes into and out of Dublin City Centre, have actually declined over the past 10 years, as is shown in sources such as the DCC / NTA *Canal Cordon Report 2019*.

2.16.5 There is a permanent traffic counter on the N31, on Brewery Road. This permanent traffic counter allows for longer traffic growth trend to be assessed. The data from this permanent Transport Infrastructure Ireland (TII) counter is summarised in Table 2.1. This shows that traffic flows along Brewery Road have not grown in recent years and if anything has shown a slight decline overall. This is in keeping with ongoing sustainable transport policies of promoting more sustainable modes of travel and in locating new residential development closer to high frequency and high capacity public transport networks, such as those that exist at the subject site.

Table 2.1: Traffic Growth Trends on N31 (Brewery Road)

	2019	2018	2017	2016	2015	2014	2013
AADT	15,538	15,687	16,066	15,530	15,824	16,018	15,880
%HGV	2%	2.1%	1.7%	1.7%	1.7%	1.5%	1.4%
Coverage	99.7%	99.5%	99.7%	99.7%	99.7%	99.7%	83.6%

2.16.6 The proposed development at Dundrum strengthens this sustainable development pattern, by densifying existing residential development in an area with significant local employment and in an area well served by sustainable travel modes.

2.16.7 This trend is also underpinned by NTA data that show the results of changes to travel patterns between 2015 and 2019 as follows:

- An increase in the use of sustainable travel into the city centre in the morning peak from 66% (2015) to 72% (2019)
- A reduction in cars from 65,000 (2015) to 58,000 (2019)
- Growth in total passenger trips (bus) from 120millon (2015) to 153millon (2019) for the metropolitan area
- Growth in total passenger trips (Luas) from 35millon (2015) to 48millon (2019) for the metropolitan area

2.16.8 The accommodation of future overall travel demand resulting from future economic and population growth can happen in tandem with a reduction in overall car numbers by prioritising new development in areas well served by public transport and sustainable travel modes such as the subject lands.

2.17 Post Covid-19 Likely Transport Trends

2.17.1 The level of remote working in Ireland was historically lower than that of other northern European countries. The Covid-19 pandemic resulted in significant reductions in travel demand generally coupled with a significant increase in remote working (including working from home and teleworking).

2.17.2 Early research indicates that post Covid-19 the level of remote working will remain greater than at pre Covid -19 levels. This is likely to result in reduced peak time travel demands for both public transport and the private car particularly, at peak periods. This trend is anticipated to be more pronounced on public transport and road networks leading into large towns and cities as people will have a greater opportunity to work from home or local work hubs.

3 OVERVIEW OF PROPOSED DEVELOPMENT AND STUDY AREA TRANSPORT NETWORK ASSESSMENT

3.1 Proposed Development

3.1.1 The site of the proposed development is in Dundrum, Dublin 14. The planning application site is approximately 9.6 ha in area and located approximately 4.5km from Dublin City Centre. The area is largely residential with established schools, community and social facilities in the vicinity.

3.1.2 The Dundrum Central Mental Hospital site is located in a well-established residential area and close to schools, University College Dublin, major employment and retail facilities including Dundrum Town Centre, and local amenities. It is also within a short walk of the high capacity and high-frequency Luas Green Line and to a number of Dublin Bus services.

3.1.3 The proposed development will also include a creche and small retail units to meet local demand. The masterplan sets out the overall planned development for the entire subject lands.

3.1.4 The location of the proposed development is shown in Figure 3.1.

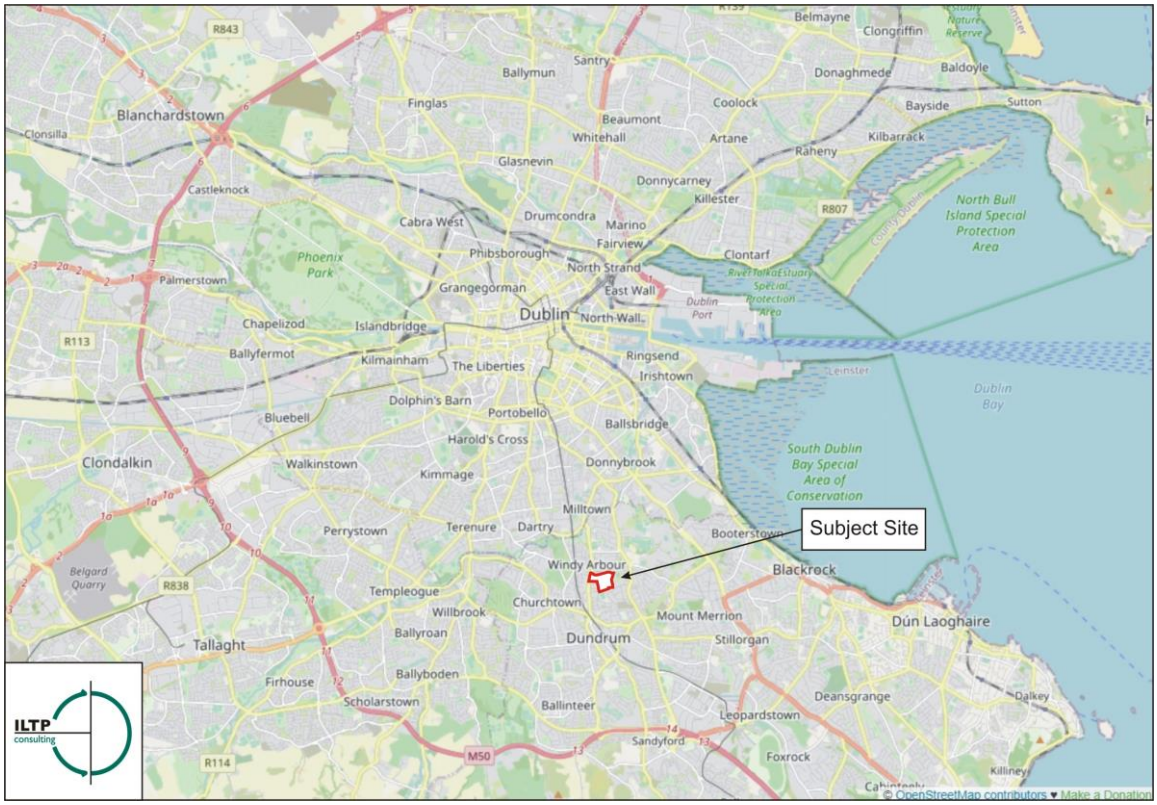


Figure 3.1: Location of Proposed development

3.2 Overview of Proposed Development

3.2.1 The Land Development Agency intend to apply to An Bord Pleanála (the Board) for a 10 year permission for a Strategic Housing Development with a total application site area of c.9.6 ha, on lands at the Central Mental Hospital, Dundrum Road, Dundrum, Dublin 14. The subject site is in the immediate setting and curtilage of a number of proposed protected structures, namely the 'Asylum' (RPS No. 2072), the 'Catholic Chapel' (RPS No. 2071) and the 'Hospital Building' (RPS No. 2073).

3.2.2 The development will consist of the demolition of existing structures associated with the existing use (3,736 sq m), including:

- Single storey former swimming pool / sports hall and admissions unit (2,750 sq m);
- Two storey redbrick building (305 sq m);
- Single storey ancillary and temporary structures including portacabins (677 sq m);
- Removal of existing internal sub-divisions/ fencing, including removal of security fence at Dundrum Road entrance;
- Demolition of section of porch and glazed screens at Gate Lodge building (4 sq m);
- Removal of walls adjacent to Main Hospital Building;
- Alterations and removal of section of wall to Walled Garden.

3.2.3 The development will also consist of alterations and partial demolition of the perimeter wall, including:

- Alterations and removal of section of perimeter wall adjacent to Rosemount Green (south);
- Formation of a new opening in perimeter wall at Annaville Grove to provide a pedestrian and cyclist access;
- Alterations and removal of sections of wall adjacent to Dundrum Road (including removal of existing gates and entrance canopy), including reduction in height of section, widening of existing vehicular access, provision of a new vehicular, cyclist and pedestrian access;
- Alterations and removal of section of perimeter wall adjacent to Mulvey Park to provide a pedestrian and cyclist access.

3.2.4 The development with a total gross floor area of c. 106,770 sq m (c. 106,692 sq m excluding retained existing buildings), will consist of 977 no. residential units comprising:

- 940 no. apartments (consisting of 53 no. studio units; 423 no. one bedroom units; 37 no. two bedroom (3 person) units; 317 no. two bedroom (4 person) units; and 110 no. 3 bedroom units) arranged in 9 blocks (Blocks 02-10) ranging between 2 and 6 storeys in height (with a lower ground floor to Block 03 and Block 10, resulting in part 7 storey), together with private (balconies and private terraces) and communal amenity open space provision (including courtyards and roof gardens) and ancillary residential facilities;
- 17 no. duplex apartments (consisting of 3 no. 2 bedroom units and 14 no. 3 bedrooms units located at Blocks 02, 08 and 09), together with private balconies and terraces.
- 20 no. two and three storey houses (consisting of 7 no. three bedroom units and 13 no. 4 bedrooms units) and private rear gardens located at Blocks 02, 08 and 09).

3.2.5 The development will also consist of 3,889 sq m of non-residential uses, comprising:

- Change of use and renovation of existing single storey Gate Lodge building (reception/staff area) to provide a café unit (78 sq m);
- 1 no restaurant unit (307 sq m) located at ground floor level at Block 03;
- 6 no. retail units (1,112 sq m) located at ground floor level at Blocks 03, 06 and 07;
- 1 no. medical unit (245 sq m) located at ground floor level at Block 02;

- A new childcare facility (463 sq m) and associated outdoor play area located at ground floor level at Block 10; and
- A new community centre facility, including a multi-purpose hall, changing rooms, meeting rooms, storage and associated facilities (1,684 sq m) located at ground and first floor level at Block 06.
- Vehicular access to the site will be from the existing access off Dundrum Road, as revised, and from a new access also off Dundrum Road to the south of the existing access.

3.2.6 The development will also consist of the provision of public open space and related play areas; hard and soft landscaping including internal roads, cycle and pedestrian routes, pathways and boundary treatments, street furniture, wetland feature, part-basement, car parking (547 no. spaces in total, including car sharing and accessible spaces); motorcycle parking; electric vehicle charging points; bicycle parking (long and short stay spaces including stands); ESB substations, piped infrastructural services and connections (including connection into existing surface water sewer in St. Columbanus Road); ducting; plant (including external plant for district heating and pumping station); waste management provision; SuDS measures (including green roofs); attenuation tanks; sustainability measures (including solar panels); signage; public lighting; any making good works to perimeter wall and all site development and excavation works above and below ground.

3.3 Description of the Receiving Environment

3.3.1 The site is currently accessed from the R117 Dundrum Road and is currently operated as the Central Mental Hospital (CMH). The site is currently fully enclosed within high stone walls. The site is bordered by the R117 Dundrum Road to the west.

3.3.2 Rosemount Green borders the site to the south, and the site is bounded by existing residential development to the north, east, southeast and southwest.

3.3.3 The site is also proximate to key attractors, which include University College Dublin (approx. 1.8km to northeast), Dundrum Town Shopping Centre (approx. 1.5km to south), Dundrum Business Park and various primary and post-primary schools.

3.4 Existing Road Network

3.4.1 The proposed development is located off the R117 Dundrum Road. The R117 is a regional radial route that serves a number of surrounding residential areas and businesses and provides connectivity towards Milltown and the city centre to the north and the regional and M50 routes to the south.

3.4.2 The R825 Goatstown Road to the east is also located within 350m of the eastern boundary of the site, which also runs north south and has dedicated cycle lanes in place in the vicinity of the subject site. This route also links the city centre with the M50 Junction 14.

3.4.3 Another significant regional route, the R112 (Taney Road), is located approximately 350m from the southern boundary of the site and provides links to Chapelizod, Rathfarnham, Churchtown, Dundrum, Goatstown and Mount Merrion.

3.4.4 The road network in the environs of the subject site is shown in Figure 3.2.

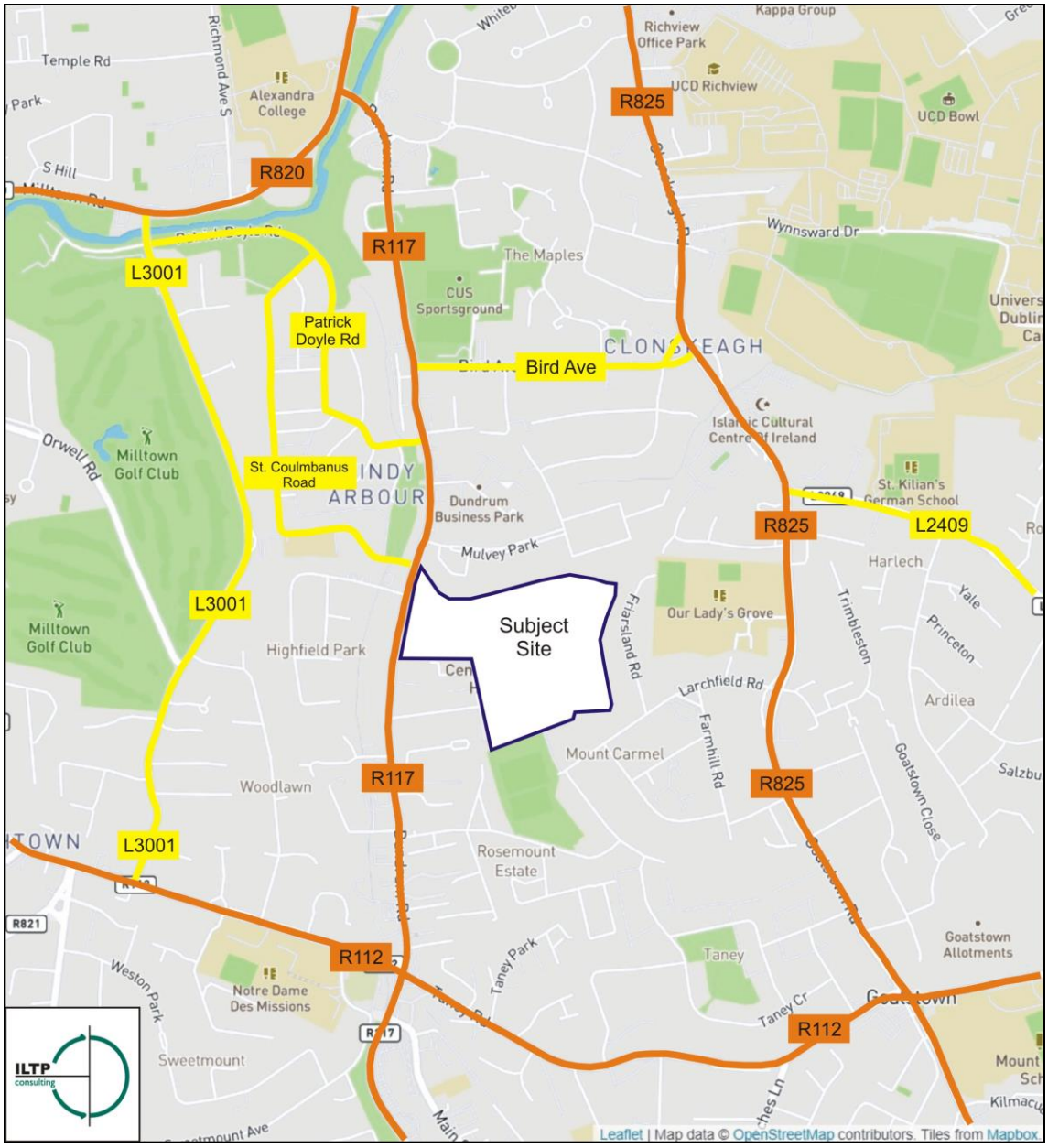


Figure 3.2: Existing Local Road Network

3.5 Existing Pedestrian and Cycle Network

3.5.1 Pedestrian facilities including footpaths are provided on the R117 adjacent to the proposed development. There is an existing pedestrian/cycle crossing on the R117 at the junction with St. Columbanus' Road, which facilitates pedestrian and cycle access to the Windy Arbour Luas stop.

3.5.2 St. Columbanus' Road to the immediate west of the site facilitate direct cycle connectivity between the subject site and the Windy Arbour Luas stop. St. Columbanus' Road only has local access inward off Dundrum Road and has a one-way contra flow cycle lane on the one-way section of the road.

3.5.3 In addition to the pedestrian facilities adjacent to the existing road network, there are pedestrian routes in the adjacent Rosemount Green to the south which can be linked into from the proposed development.

3.5.4 There are no dedicated cycle provisions on the R117 Dundrum Road. The R825 Goatstown Road to the east is also located within 350m of the eastern boundary of the site and has dedicated cycle lanes in place.

3.6 Existing Luas and Bus Services

3.6.1 The subject site is to the east of the Luas Green Line running from Brides Glen to Broombridge via the City Centre, with the Windy Arbour stop in closest proximity. A number of bus services are also located in the area. Public transport services were reduced during the covid-19 pandemic with new service introduced recently. More detailed examinations of the capacity and frequency or both Luas and Bus services are presented in sections 4.7 and 4.8 respectively.

3.7 Planned Road Improvements

3.7.1 There are no major road improvements planned for the local road network. This is consistent with the desire to promote future growth in the use of sustainable travel modes and to encourage more people to use these sustainable modes ahead of the private car.

3.8 Planned Bicycle Network and Delivery

3.8.1 The NTA published the Greater Dublin Area Cycle Network Plan in 2013 which includes extensive proposals for cycle network improvements throughout Dublin and the Greater Dublin Area, which are being implemented on an ongoing basis. This includes the designation of Goatstown Road as a Primary Cycle Route and Dundrum Road as a feeder Cycle Route. Goatstown Road already has dedicated cycle lanes in place which accords with its Primary Route classification. Dundrum Road is also designated as a feeder route in this plan. Further cycle network improvements in the vicinity of the subject site in line with the NTA's published proposals would further promote cycling for residents of the proposed development.

3.8.2 The planned network in the vicinity of the subject site is shown in Figure 3.3.

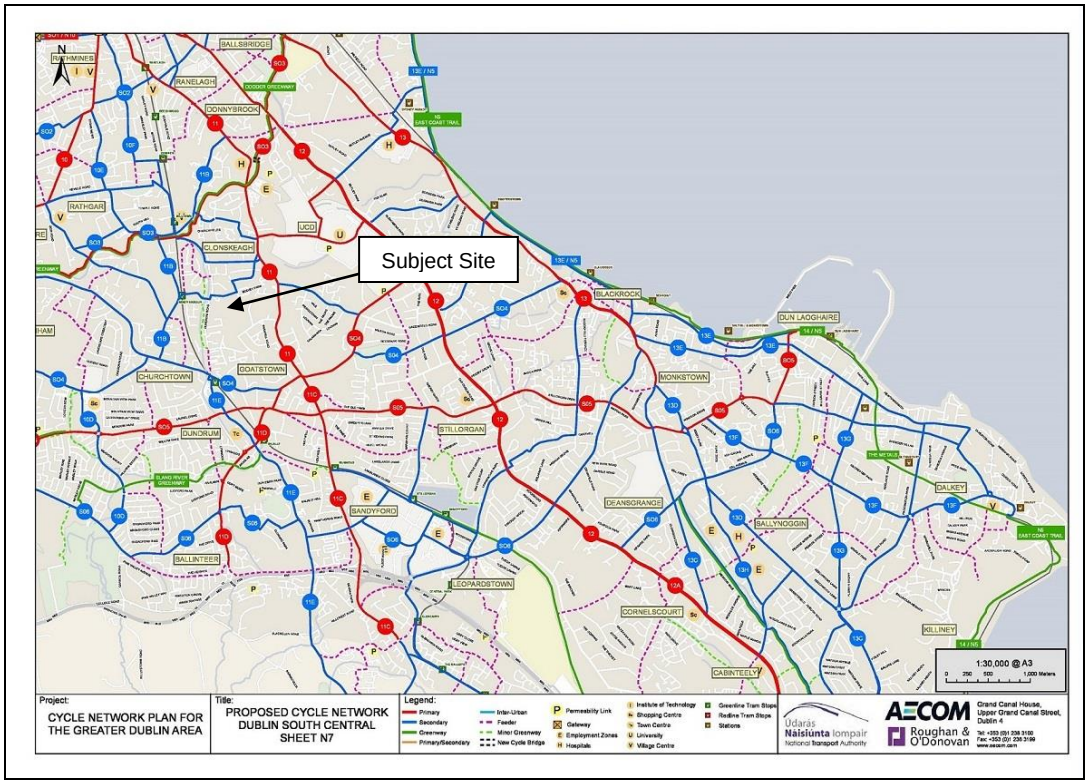


Figure 3.3: Planned Cycle Network (Source: NTA – GDA Cycle Network Plan)

3.8.3 A primary cycle network is planned on Goatstown Road to the east of the subject site and a feeder network is planned adjacent to Dundrum Road.

3.8.4 The roll-out of the cycle network in the Greater Dublin Area (GDA) has already resulted in large increases in cycling numbers. This growth in cycle level in the GDA is now higher than at any time in the past 30 years the NTA are proposing a 14% mode share target for cycling in their recent consultation document for the transport strategy for the GDA.

3.8.5 The NTA provides significant funding for active travel measure to local authorities and has allocated €39millon for 2022 for funding a variety of walk and cycle project to DLR. This represents a very significant investment in sustainable travel modes and will see the delivery of improved walking and cycle facilities in the area over time.

3.9 Current and Future Bus Service Improvements

Bus Connects Network and Ongoing Upgrades

3.9.1 The NTA is in the process of implementing a new Dublin Area Bus Network, which is being implemented on a phased basis and commenced in June 2021. This includes a series of primary Spine routes classified as ‘A’ routes, with additional Radial, Orbital, Local and Peak-Only / Express routes.

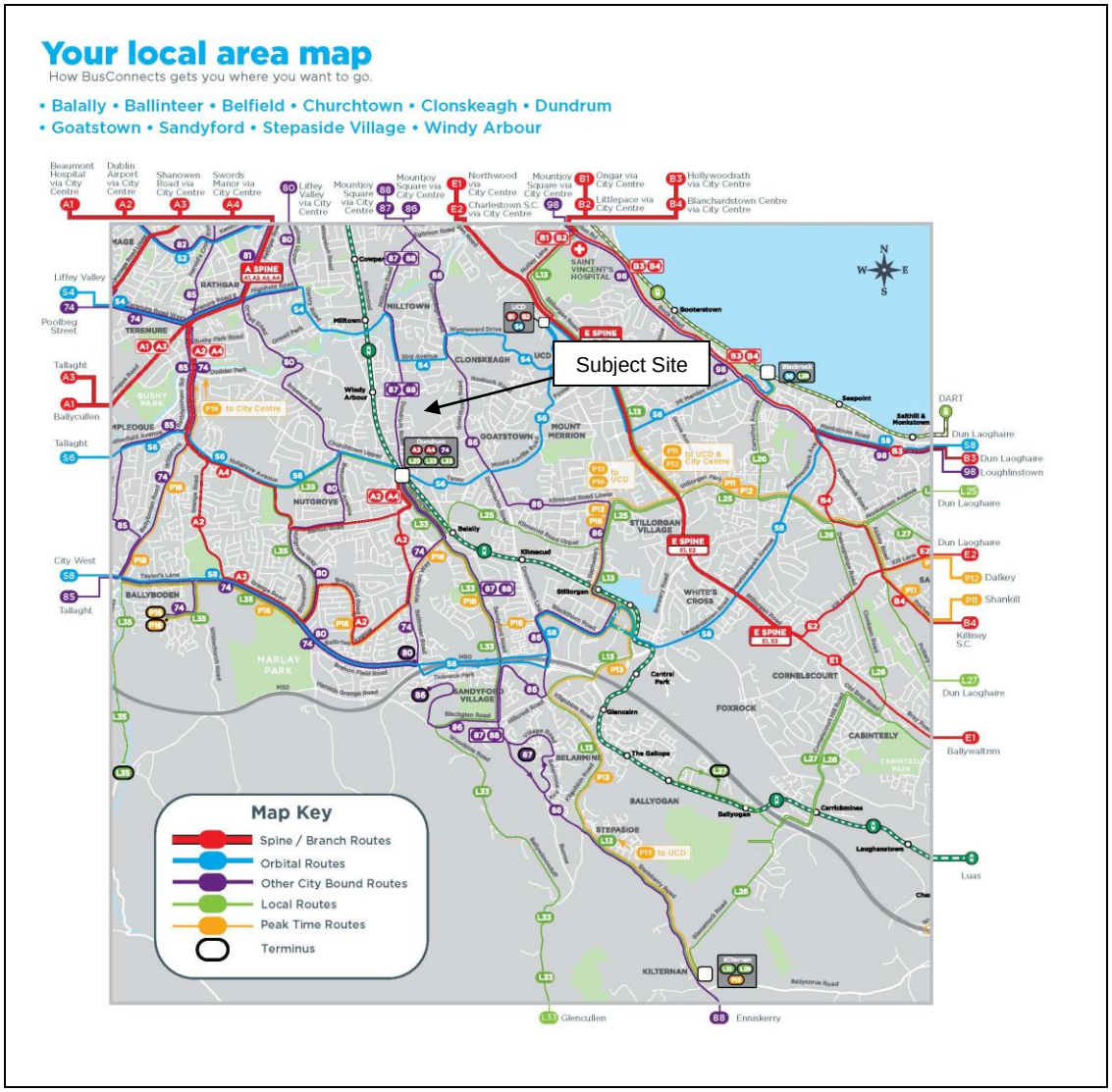


Figure 3.4: New Dublin Area Bus Network in Vicinity of Subject Site (Source: NTA)

3.9.2 These proposed routes will replace the existing routes serving the site, including routes 11, 44, 61 and 142.

3.9.3 Spine Route A2, connecting to Dublin Airport via the City Centre, and A4 to Swords via the City Centre, will operate at 12 minute intervals and can be accessed to the south of the Central Mental Hospital (CMH) site at the Dundrum Luas stop. Route A2, in particular, provides a more frequent and direct service to and from the city centre, which would benefit the proposed development.

3.9.4 The new Dublin Area Bus Network also include for increased orbital connectivity and frequency for the subject site. This includes Orbital Route S4 on Bird Avenue linking to Liffey Valley at 10 minute intervals and Orbital Route S6 on Taney Road serving Tallaght at 15 minute intervals.

3.9.5 New citybound routes 86 along Goatstown Road and 87 and 88 along Dundrum Road are also included in the proposed network, which replace existing Dublin Bus routes 11, 44 and 61. The new bus network proposals maintain the frequency of service along Dundrum Road, however, the interval between peak hour bus services on Goatstown Road is proposed to increase to 20 minutes from 30 minutes.

3.9.6 The NTA is also proposing to implement Core Bus Corridors (CBCs) and new transport interchanges, which are proposed to deliver better and more reliable bus frequencies across the bus network. These will also include for improved cycle and pedestrian facilities as part of these proposed schemes. These schemes are planned to be implemented on a phased basis, subject to the necessary statutory approvals.

3.10 Recent Luas Green Line Upgrades

3.10.1 Since its initial opening in 2004, the Luas Green Line has been upgraded in terms of capacity, frequency and extent of service in response to passenger demand on an ongoing basis. The Luas Green line was recently extended to Broombridge as part of the Luas Cross City project, where it connects to the main national rail network. This increased the overall catchment of the Luas network and provided for better integration of public transport services generally.

3.10.2 Transport Infrastructure Ireland (TII) published plans for the Luas Green Line Capacity Enhancement (LGCE) project in 2019, to provide extra capacity in the short to medium term in the Luas Green Line. This included lengthening the existing green line trams to 55m in length, purchasing 8 additional 55m long trams and a major expansion of Sandyford Depot, which is currently underway, to facilitate the growth in the green line fleet.

3.10.3 In October 2019, the first of the newly extended trams to run on the Luas Green Line was introduced, and 25 more were to be extended and enter service over the next 14 months. The 11.1m extension increases the length of the tram from 44m to 55m and increases passenger capacity.

3.10.4 The increases in capacity and frequency of services on the Luas Green Line will benefit the proposed development and will further promote a greater uptake of public transport services as an alternative to the private car.

3.10.5 The main objectives of the GLCE are summarised as follows:

- 40% overall increase in service capacity
- Increase of 3,000 passengers per direction per hour (pdph)
- Future proof line capacity into 2030’s
- Purchase of 8 new trams
- Increase length of the existing fleet (26 trams) to 55m long
- Increased tram capacity
- Increased service frequency

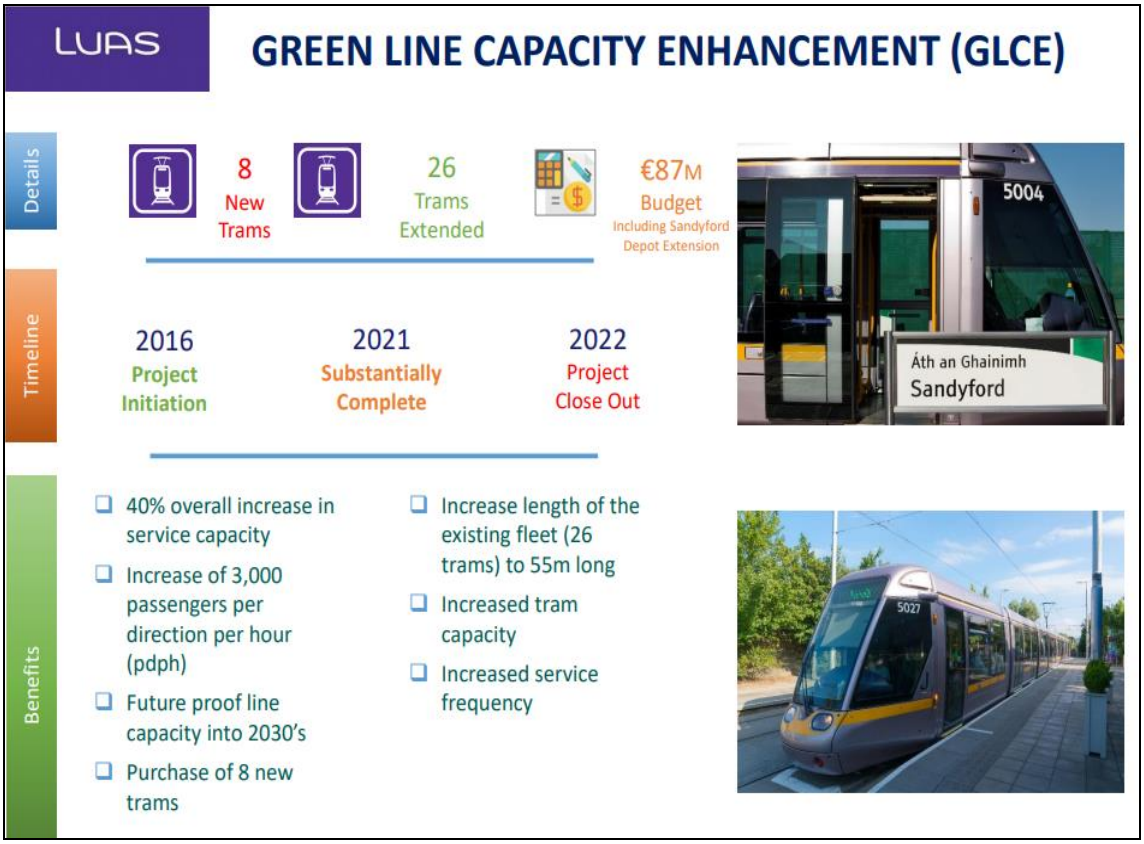


Figure 3.5: Luas Green Line Capacity Enhancement (Source: TII)

3.10.6 The TII has recently confirmed that Luas upgrades are now completed. There is, therefore, significant additional capacity available on the Luas Green Line to accommodate significant increase in demand among the corridor and this capacity increase the future-proofed to accommodate anticipated demand to 2030.

3.11 Luas Green Line Capacity and Frequency

3.11.1 The new Luas 55m trams have a theoretical capacity of 408 passengers/tram. This increased the tram capacity from 319 passengers/tram, which is over 25% of an increase.

3.11.2 The new improvement works to the line have also allowed for increased frequencies on the line. Based on the new capacity of the Luas trams the estimated Luas line capacity in persons per direction per hour (pdph) at peak periods based on the following frequencies are:

- 408 @ 5min frequency = 4,896 pdph
- 408 @ 3min frequency = 8,160 pdph
- 408 @ 2min frequency = 12,240 pdph

3.11.3 It's assumed an 80% operational capacity of 367 passengers/tram can readily be accommodated on the new Luas 55m trams. Based on the operational capacity of the Luas trams the estimated Luas line capacity in person per direction per hour(pdph) at peak periods based on the following frequencies are:

- 367@ 5min frequency = 4,404 pdph
- 367@ 3min frequency = 7,340 pdph
- 367@ 2min frequency = 11,010 pdph

3.11.4 The Luas system is also future proofed to accommodate 2minute frequencies. This means that additional capacity can be added to the Luas to meet future growth demands on an incremental basis.

3.11.5 The capacity and frequency of the public transport services are assessed further in the following chapters.

4 ACCESS LAYOUT AND PUBLIC TRANSPORT CAPACITY ASSESSMENT

4.1 Delivering Sustainable Lands Use and Transport Planning

4.1.1 In terms of promoting the delivery of sustainable travel, the following criteria were applied to the CMH lands in descending order of priority.

- Reduced the need to travel
- Reduce the distance travelled
- Reduce time spent travelling
- Promote walking as cycle use
- Located new development in areas well served by public transport
- Make appropriate provision for the private car

4.1.2 The provision of residential development along with local facilities helps reduce the need to travel in the first instance. The promotion of increased working from home likewise reduces the overall demand on the transport network.

4.1.3 Reducing the distance travelled can have a significant impact on reducing the demand for travel on the wider transport network. Put simply, if the overall distance travelled per trip was reduced by 20% this would reduce the overall demand on both the public transport and road networks by 20%.

4.1.4 Reducing the time spent travelling has clear economic and environmental benefits. It also has wider societal benefits through ensuring greater time is available for family life, community participation and personal wellness.

4.1.5 Promoting travel by walk and cycle modes ahead of public transport and the private car is clearly preferable on a cost basis and provides associated health and fitness benefits.

4.1.6 Where other modes of travel are required, the emphasis should be to promote the use of public transport (Luas and Bus) ahead of the private car.

4.1.7 The above criteria were applied to the CMH lands in developing the overall sustainable transport strategy of the CHM lands and in informing the overall access strategy and layout of the subject site.

4.2 Review of Existing Access Arrangement off Dundrum Road

4.2.1 There are a number of junctions along Dundrum Road in the vicinity of the proposed development. The junctions are either priority or signal-controlled. The main junctions location along Dundrum Road and their spacings are illustrated in Figure 4.1.

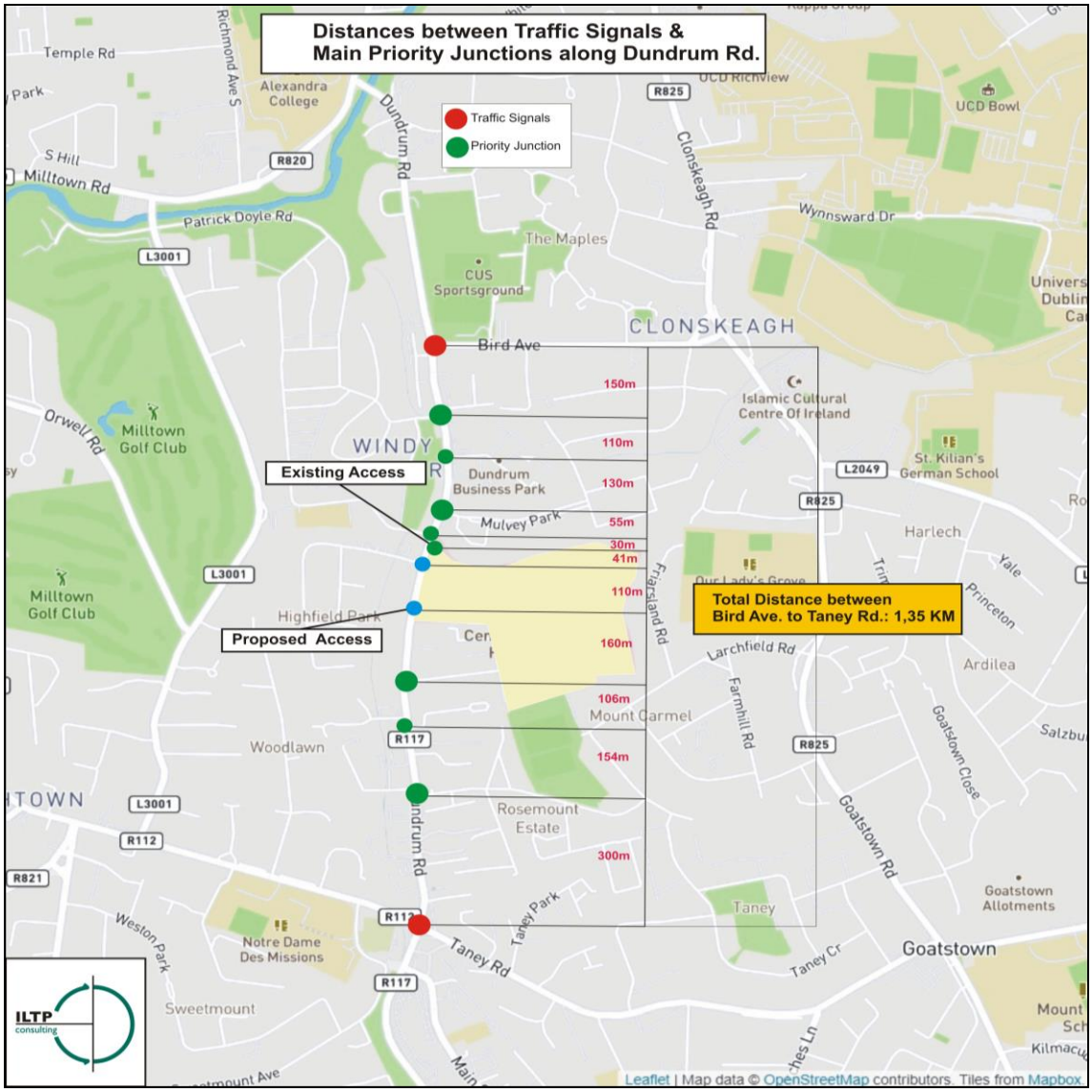


Figure 4.1: Evaluation of Junction Strategy

4.2.2 There are two signal-controlled junctions on Dundrum Road, at Bird Avenue and at the Taney Road. The remainder of junctions along Dundrum Road are priority junctions that mainly serve local residential developments. It was, therefore, decided that the new accesses proposed off Dundrum Road should also be priority junctions.

4.3 Access Proposals Off Dundrum Road

4.3.1 The proposed access for the development is via 2 no. priority junctions off R117 Dundrum Road along the western boundary of the site.

4.3.2 The northern access junction is proposed as an upgrade of the existing access to the CMH lands, the proposed southern access is proposed as a newly constructed priority junction off the R117. The proposed road layout is shown in Figure 4.2.

Figure 4.2: Proposed Road Layout (Source: BMCE)

4.3.3 During pre-planning discussions, DLRCC raised concerns surrounding the prospect of singular vehicular access to the site (as per the current access arrangements) given the number of units proposed. In order to address this, various access strategies were explored by the Applicant team. This included an option to introduce a second vehicular access point to the south of the lands, via Rosemount Green which would provide vehicular access onto Larchfield Road. Whilst this was welcomed by DLRCC, various constraints were identified by the Applicant team in respect of the proposal and delivery of this route, including land zoning constraints and challenges associated with Rosemount Green being outside of the Applicant's control.

4.3.4 We therefore propose an alternative strategy that is fully deliverable by the Applicant and achieves a second vehicular access point without giving rise to traffic related issues either within or outside the subject site. We consider that the proposed access strategy in this regard is acceptable for the following reasons:

- The second access will ensure that all site related traffic is not concentrated at one access point.
- It will reduce potential congestion on Dundrum Road that might arise with a single access point.
- It will reduce traffic congestion pedestrian crossing on Dundrum Road;
- It will ensure that vehicular access to the site is maintained should an access be blocked due to an emergency, road maintenance etc.
- It will contribute to the creation of filtered permeability through the development and reduce concentration of vehicular traffic.

4.4 Proposed Permeability Through Dundrum Central – Sustainable Travel Modes

4.4.1 The proposed development site is strategically located within the Dundrum area, with key attractors in the immediate vicinity of the site.

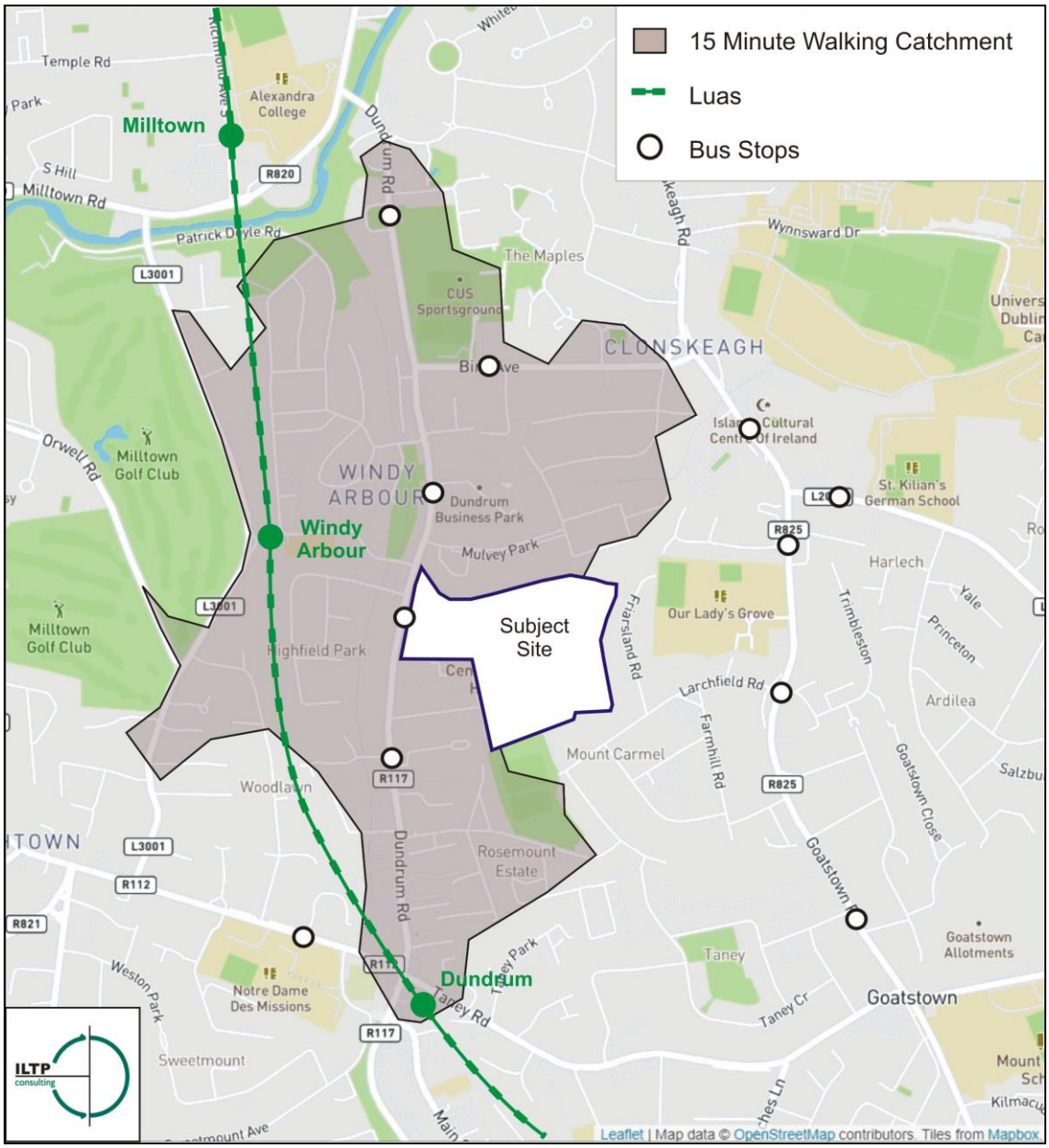


Figure 4.3: Existing 15-minute Walking Catchment from the Masterplan Lands

4.4.2 The current site is bounded by a high stone wall which restricts movement through the lands for cyclists and pedestrians as illustrated in Figure 4.3 and has good accessibility to the Luas stop at Windy Arbour and a variety of bus routes and local facilities.

4.4.3 The proposed development site layout is designed to include a new pedestrian and cycle link through the lands which will provide increased permeability in the area. As well as increasing access to the surrounding facilities this will also improve connectivity to the wider area and provide improved access to public transport services.

4.4.4 The proposed SHD application includes for a new cycle and pedestrian route through the subject lands which will be provided as part of the first phase of the development.

4.4.5 The proposals to include walk and cycle permeability through the SHD proposed development is fully in accordance with the principles set out in the Design Manual for Urban Roads and Streets (DMURS), which puts pedestrians and cyclists at the top of user priority list, followed by access to public transport and then vehicular access to the wider road network.

4.4.6 By providing a new pedestrian and cycle route through the site as part of the proposed development the pedestrian and cycle connectivity and linkages in the area will also be enhanced for both existing residents and new residents of the proposed development.

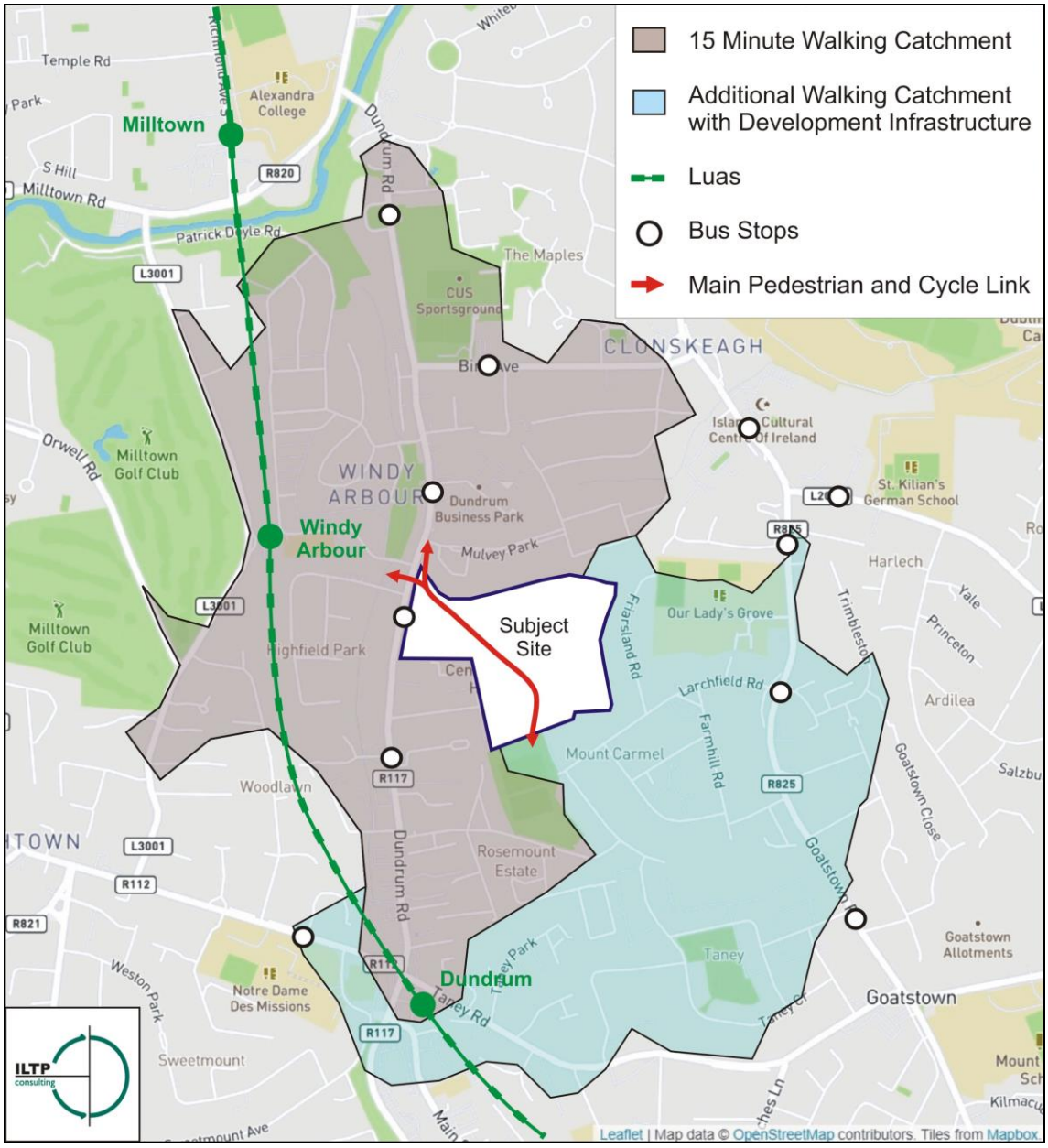


Figure 4.4: Improved 15-minute Walking Catchment with Development in Place

4.4.7 This additional pedestrian route significantly increases the walking catchment as illustrated in Figure 4.4. This extends the walk catchment significantly, particularly to the south and east of the subject lands and improves accessibility by foot to additional public transport services and to other local destinations.

4.4.8 This new route will significantly benefit existing residents of the area also and provide increased accessibility to public transport and other local services in the area, as illustrated in Figure 4.4.

4.4.9 The total walk distance between the Windy Arbour and Dundrum stops is approximately 1,500m. The distance to the Windy Arbour Stop is less than a 10-minute walk.

4.4.10 With the new walking and cycling permeability provided through the proposed development shorter walking distances will also be provided to the Dundrum Luas stop. Residents of the proposed development will have the choice of going to either of these Luas stops, thus reducing the average walking distances further.

4.4.11 The walking and cycling routes included through the proposed development further increase the accessibility to the public transport network in the area, which will benefit both the new and existing community and will provide increased accessibility to employment, retail, educational and leisure facilities in the area.

4.5 Summary of Proposed Pedestrian & Cyclist Accesses

4.5.1 In addition to the proposed access junctions off Dundrum Road a number of other pedestrian and cycle access points are proposed:

- Removal of section of perimeter wall adjacent to Mulvey Park to enable a pedestrian and cyclist access.
- Creation of a dedicated pedestrian and cycle route proposed to run through the site connecting Mulvey Green to Rosemount Green.
- Formation of a new opening in perimeter wall at Annaville Grove to provide for local pedestrian and cyclist access.
- Additional internal cycle and pedestrian facilities also proposed

4.5.2 The proposed new pedestrian and cycle link through the development of the site will significantly improve connectivity to public transport and to local services in the area. It will also benefit the existing local community by providing a new public link through the subject site. The proposed link to Annaville Grove will provide a more local connection for the existing residents and allow for access to the new facilities included as part of the proposed new development.

4.6 East-West Permeability - Assessment

4.6.1 As part of the submission to An Bord Pleanála, in advance of the tri-partite meeting, DLR suggested that an east west pedestrian and cycle link from the subject site to Friarsland Road to the east should be considered.

4.6.2 While this link could not be delivered by the applicant, as it involves lands in third party ownership, an evaluation of this option was nevertheless undertaken.

4.6.3 An indicative route from the proposed development to Friarsland Road linking to the proposed development is illustrated in Figure 4.5 along with the distance from the centre of the proposed development to an external point.

4.6.4 Given that Friarsland Road is currently a cul-de-sac the assessment demonstrates that this route would offer little if any benefits as the alternative link via Rosemount Green provides similar linkages for pedestrians and cyclists to the surrounding area.

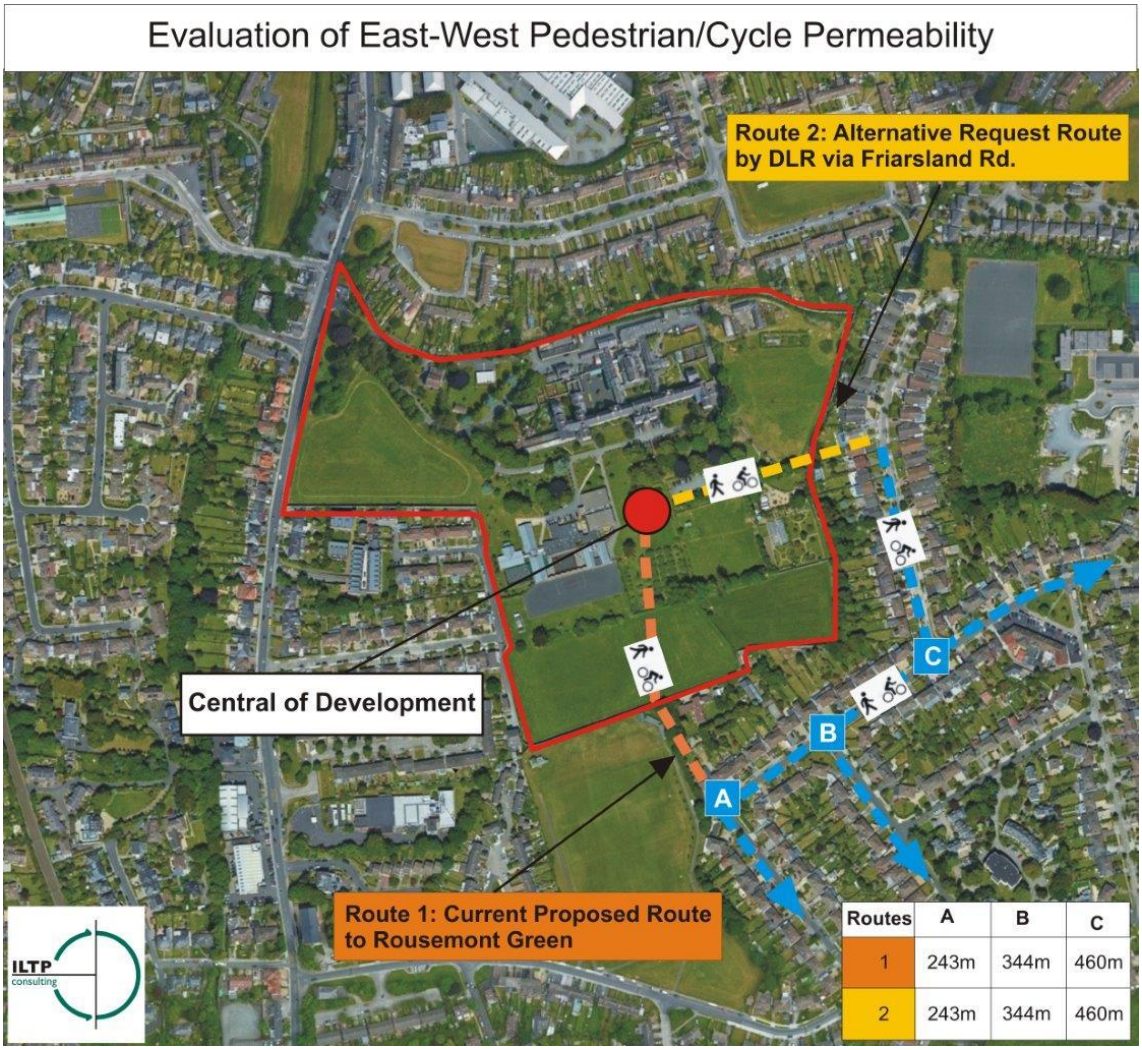


Figure 4.5: Evaluation of East-West Cycle and Pedestrian Link

4.6.5 The detailed design of the access arrangements and internal street layouts are detailed in the separate architects and engineers' drawings and reports accompanying this planning application.

4.7 The Urban Development Building Height Guidelines (2018) - Transport Requirement

4.7.1 The Urban Development and Building Height Guidelines (2018) require that for increases in building height to be considered the following should be required:

> *"The site is well served by public transport with high-capacity, frequency service and good links to other modes of public transport"*

4.7.2 For this, we have taken the requirements of these guidelines in respect to public transport as meaning having both a high capacity and high-frequency service.

4.7.3 In terms of capacity, different forms of public transport have different capacities per vehicle type operating on a route. The capacity of the transport service is therefore a combination of both capacity and frequency.

4.7.4 The location of the proposed development will therefore require to be considered in the context of its accessibility to public transport and other services.

4.7.5 The Apartment Guidelines provide further useful guidance on how to assess particular locations for planned development with regard to public transport availability.

4.8 Apartment Guidelines 2020 Guidance - Transport Accessibility, Capacity and Frequency

4.8.1 The *Sustainable Urban Housing: Design Standards for New Apartments* guidelines, published in 2020, further clarification and guidance on development locations and their accessibility to public transport and services such as high employment centres. These urban locations are described in the guidelines as follows:

1) "Central and/or Accessible Urban Locations

Such locations are generally suitable for small- to large-scale (will vary subject to location) and higher density development (will also vary), that may wholly comprise apartments, including:

- *Sites within walking distance (i.e. up to 15 minutes of 1,000-1,500m), of principal city centres, or significant employment locations that may include hospitals and third level institutions.*
- *Sites within reasonable walking distance (i.e. up to 10 minutes or 800-1,000m) to/from high capacity urban public transport stops (such as DART or Luas); and*
- *Sites within easy walking distance (i.e. up to 5 minutes or 400-500m) to/from high frequency (i.e. min 10 minute peak hour frequency) urban bus services.*

The range of locations outlined above is not exhaustive and will require local assessment that further considers these and other relevant planning factors.

2) Intermediate Urban Locations

Such locations are generally suitable for smaller-scale (will vary subject to location), higher density development that may wholly comprise apartments, or alternatively, medium-high density residential development of any scale that includes apartments to some extent (will also vary, but broadly >45 dwellings per hectare net) including:

- *Sites within or close to i.e. within reasonable walking distance (i.e. up to 10 minutes or 800-1,000m), of principal town or suburban centres or employment locations, that may include hospitals and third level institutions;*
- *Sites within walking distance (i.e. between 10-15 minutes or 1,000-1,500m) of high capacity urban public transport stops (such as DART, commuter rail or Luas) or within reasonable walking distance (i.e. between 5-10 minutes or up to 1,000m) of high frequency (i.e. min 10 minute peak hour frequency) urban bus services or where such services can be provided;*
- *Sites within easy walking distance (i.e. up to 5 minutes or 400-500m) of reasonably frequent (min 15 minute peak hour frequency) urban bus services.*

The range of locations is not exhaustive and will require local assessment that further considers these and other relevant planning factors.

3) Peripheral and/or Less Accessible Urban Locations

Such locations are generally suitable for limited, very small-scale (will vary subject to location), higher density development that may wholly comprise apartments, or residential development of any scale that will include a minority of apartments at low-medium densities (will also vary, but broadly <45 dwellings per hectare net), including:

- *Sites in suburban development areas that do not meet proximity or accessibility criteria;*
- *Sites in small towns or villages.*

The range of locations outlined above is not exhaustive and will require local assessment that further considers these and other relevant planning factors."

4.8.2 The Apartment Guidelines 2020 do however provide good guidance as to how a particular location might be classified in terms of accessibility to a high capacity and high frequency public transport service.

4.8.3 Central and/or accessible urban location are, in transport terms, defined as those within 10 minutes or 800-1,000m walk to/from high-capacity urban public transport stops (such as DART or Luas) or site within a 5minutes of 400-500m of a high frequency urban bus service.

4.9 Application of Guidelines to SHD Application Lands

4.9.1 In transportation terms proposed Dundrum Central development will be located within a 10-minute or 800-1,000m walk from Luas Green Line Windy Arbour Luas Stop, which is a high-capacity public transport service.

4.9.2 High-frequency services are defined as those having a frequency of 10 minutes or less. The recorded LUAS frequencies of 3 to 5 minutes at peak times confirm that the subject lands are also served by very-high frequency public transport.

4.9.3 In addition, there are several bus services in the area that provide access by public transport to a wide range of destinations. The proposed walking and cycle facilities also provide improved linkage to the public transport service in the area for both the new and existing residents.

4.9.4 The subject lands are, therefore, well served by an existing high-capacity and high-frequency transport service.

4.10 Summary of Transport and Connectivity Strategy

4.10.1 The proposed Dundrum Central SHD site is currently well served by the high frequency and high capacity Luas services that are already in place. The travel demands of the proposed SHD development will be further mitigated through the implementation of the MMP measures, set out later in this report.

5 PROPOSED CAR PARKING ASSESSMENT AND PROPOSALS

5.1 Introduction

5.1.1 The proposed development is currently well served by high capacity and high frequency public transport. It is therefore appropriate and in keeping with sustainable transport objectives that the level of car and cycle parking be set at an appropriate level. The CDP sets out car parking standards and guidance on car parking provision while the Government's Apartment Guideline 2020 gives more recent guidance for setting appropriate car and cycle levels.

5.2 CDP - Car Parking Standards and Guidance

5.2.1 The County Development Plan (CDP) set out maximum car parking standards for residential development. Section 8.2.4.5 of the Development Plan which sets out further commentary in relation to car parking standards which includes provision for reduced car parking standards for development, dependent upon consideration against a number of criteria.

5.2.2 Section 8.2.4.5 of the Development Plan provides for reduced car parking standards and provides the following guidance.

> *"Reduced car parking standards for any development (residential and non-residential) may be acceptable dependant on:*
>
> - *The location of the proposed development and specifically its proximity to Town Centres and District Centres and high density commercial/business areas.*
> - *The proximity of the proposed development to public transport.*
> - *The precise nature and characteristics of the proposed development.*
> - *Appropriate mix of land uses within and surrounding the proposed development.*
> - *The availability of on-street parking controls in the immediate area.*
> - *The implementation of a Travel Plan for the proposed development where a significant modal shift towards sustainable travel modes can be achieved.*
> - *Other agreed special circumstances where it can be justified on sustainability grounds.*

5.2.3 The CDP therefore allows for reductions is car parking where appropriate.

5.3 Application of Apartment Guidelines 2020

5.3.1 The *Sustainable Urban Housing: Design Standards for New Apartments* guidelines, published in 2020, include recommendations for provision of car and cycle parking for apartments depending on the urban location of the proposed development

5.3.2 The Apartment Guidelines recommend the following approach to car parking provision based on the location of a proposed development:

"Central and/or Accessible Urban Locations:

In larger scale and higher density developments, comprising wholly of apartments in more central locations that are well served by public transport, the default policy is for car parking provision to be minimised, substantially reduced or wholly eliminated in certain circumstances. The policies above would be particularly applicable in highly accessible areas such as in or adjoining city cores or at a confluence of public transport systems such rail and bus stations located in close proximity.

Intermediate Urban Locations:

In suburban/urban locations served by public transport or close to town centres or employment areas and particularly for housing schemes with more than 45 dwellings per hectare net (18 per acre), planning authorities must consider a reduced overall car parking standard and apply an appropriate maximum car parking standard.

Peripheral and/or Less Accessible Urban Locations:

As a benchmark guideline for apartments in relatively peripheral or less accessible urban locations, one car parking space per unit, together with an element of visitor parking, such as one space for every 3-4 apartments, should generally be required."

5.3.3 For central and /or accessible urban locations the Apartment Guidelines recommend that the level of car parking should be minimised, substantially reduced or wholly eliminated in certain circumstances.

5.4 Proposed Car Parking Rational:

5.4.1 The proposed development site, in transport and accessibility terms, is located in a Central and/or Accessible Urban Location and well served by high capacity and high-frequency public transport as demonstrated in the assessment set out earlier in this report. Therefore, reduced car parking provision is required for the proposed subject site.

5.4.2 The applicant, the LDA, is likewise committed to delivering a low carbon development with the emphasis on sustainable travel modes and reduced private car dependency in line with wider transport and sustainability policies. The proposed development includes for a variety of local facilities, which means that many services will be available within the development or within a short walk of the new residential development. This will further reduce the need to travel and also encourage more people to use local facilities.

5.4.3 Many of these non-residential elements will be available to the existing surrounding community, which can readily access these facilities by foot or bike, which will provide wider community benefits as well as reducing car dependency on existing communities which will over time help to reduce overall traffic in the area. The internal street layout and the provision of cycle and pedestrian connectivity through the site will further promote sustainable travel patterns for both the existing and new communities.

5.4.4 The applicant is also keen to promote less car dependency and are committed to including support measure to encourage those that wish not to own a car to reside in the new development. Such support measures are set out in the Mobility Management Plan (MMP) section of this report.

5.4.5 The proposed car parking provision and allocation is set out in Table 5.1 and has a general car parking ratio of approximately 0.5 spaces per dwelling for the proposed development, which is generally consistent with national policy for new residential developments and is consequently below the maximum CDP standards.

5.5 Car Parking Provision

5.5.1 The proposed parking schedule is shown in Table 5.1. This includes reducing the level of parking allocated for studio and 1-bed apartments to a ratio of 0.15 per unit, while the 2 bed apartments will be allocated a ratio of 0.5 car parking space per apartment unit. The final allocation of apartment spaces will be based on the needs of the particular residents of the area.

5.5.2 It is assumed that 3-bed apartments and houses would attract a wide range of occupant categories, including families who would require a wider range of travel needs. The schedule includes a dedicated car parking ratio of 1 per 3 bed apartment or 3 bed house.

5.5.3 In accordance with the CDP, a minimum of 4% of total parking provision should be suitable for disabled access use. The disabled spaces will be allocated on the basis of need by the Management Company to ensure that those who need such spaces will be given priority access to disabled car parking.

5.5.4 A minimum of 10% of all car spaces will have Electric Vehicle (EV) charge facilities at the outset of the development as required by the CDP.

5.5.5 A total of 49 no. motorcycle spaces are provided, which equates to 5% of the number of residential units for the residential elements of the scheme.

5.5.6 It is also desirable to provide for those households in the proposed development who do not own a car to have occasional access to a private car if required. Therefore, parking allocation for car share schemes is provided for within the proposed development.

5.5.7 In addition, the residential units should also have some allocation for visitor car parking. It is also proposed that an additional 15% of car parking proposed (62 no.) will be provided for visitor car parking

5.5.8 Car parking spaces are also reserved for car share schemes.

5.6 Non-Residential Car Parking Proposals

5.6.1 It is anticipated that the provision of the proposed local retail and other commercial units within the proposed development would cater primarily for residents' needs. As many of the residents are a short walk from the commercial elements of the proposed development and will have low car ownership the parking needs for the non-residential elements of the proposed development will also be low. However, there will be a need to provide appropriate car parking for these facilities, which can also be used by residents who own a car or by those who reside in the surrounding area.

5.6.2 The creche is proposed to mainly facilitate residents of the proposed development many will be dropped off at the crèche on foot. A total of 11 no. car parking spaces is included for the crèche, which includes for vehicular drop-off demand and limited staff parking.

5.6.3 The proposed car parking for the restaurant is 1/50 sqm GFA and for the retail elements at 1/100 sqm GFA. For the proposed medical centre, a total of 6 no. spaces are proposed.

5.6.4 The community facility will be used mainly by the local community, and it is proposed to provide 17 no. spaces dedicated to the community centre.

5.6.5 In addition, a further 21 no. motorcycle spaces will be provided to meet the needs of the non-residential elements of the proposed development.

Table 5.1: Car Parking Provision for Proposed Development:

Proposed Use	Assumed Size / No. of Units	DLRCC Parking Standards	DLRCC Parking Requirement	Proposed Car Parking Allocation	Proposed Car Parking Provision
1 bed studios & apartments	476	1 space per Unit	476	(0.15 per unit)	71
2 bed apartments + duplex	357	1.5 spaces per Unit	536	(0.5 spaces per unit)	179
3 bed apartments + duplex	124	2 spaces per Unit	248	(1 space per unit)	124
3 bed houses	7	2 spaces per Unit	14	(1 space per unit)	7
4 bed houses	13	2 spaces per Unit	26	(1.5 spaces per unit)	20
Allocated Residential Subtotal	**977**		**1,300**		**400**
Additional 15% of Residential Parking for Visitor Parking					**62**
12 no. Car Share					**12**
15 no. Travel Club					**15**
Total Resi Car Parking				**0.50**	**489**
Total Motorcycle Parking				**5% of Residential Units**	**49**
Non Residential Car Parking					
Café	78sq. m GFA	1 per 15 sq. m GFA	5	1 per 150 sq. m GFA	0
Medical	245sq. m GFA	2 spaces per consulting room	6	2 spaces per consulting room	6
Retail (Blocks 3 & 7)	1112 sq.m GFA	1 per 50 sq. m GFA	22	1 per 60 sq. m GFA	19
Restaurant	307 sq.m GFA	1 per 15 sq. m GFA	21	1 per 50 sq. m GFA	5
Community	1684 sq. m GFA	1 per 50 sq. m GFA*	34	1 per 100 sq. m GFA	17
Creche	463 sq. m GFA	1 per staff member (including set down)	5	1 per staff member	5
				Drop off Surface	3
				Drop off Basement	3
Non- Resi Total			**93**		**58**
Motorcycle Parking					**21**
Total Car Parking (Ex M/C)					**547**
Disabled Parking					**4% of parking allocated for Disabled**

5.7 Other Considerations and Support Measures

5.7.1 To support reductions in car parking numbers that align with the Apartment Guidelines, the Mobility Management Plan (MMP) sets out details of support mechanisms that would help promote sustainable travel in accordance with national, regional and wider local policy objectives.

5.8 Proposed Cycle Parking Provision

5.8.1 It is proposed that cycle parking for the residential elements of the development will be provided in accordance with national Apartment Guidelines 2020 at a ratio of 1no. long stay space per bedroom, plus additional short stay spaces at a ratio of 1no space per 2 units.

5.8.2 Table 5.2 shows the proposed short and long stay cycle parking provision and allocation for the residential apartment elements of the proposed development. Details of cycle parking locations and facilities are detailed in the architect's drawings.

Table 5.2: Proposed Residential Cycle Parking Provision

Residential Cycle Parking	No. of Units	Apartment Guidelines Cycle Parking Standards		Proposed Cycle Parking Allocation	Proposed Cycle Parking Provision
		Short Stay	Long Stay	Short Stay	Long Stay
1 bed studios & apartments	476	1 per 2 units	1 per bedroom	238	476
2 bed apartments + duplex	357	1 per 2 units	1 per bedroom	180	714
3 bed apartments + duplex	124	1 per 2 units	1 per bedroom	62	372
3 bed houses	7	1 per 2 units	1 per bedroom	4	21
4 bed houses	13	1 per 2 units	1 per bedroom	7	52
Allocated Residential Subtotal	**977**			**491**	**1635**
Total Residential Cycle Parking				**2,126**	

5.8.3 Cargo bike parking will also be provided within the proposed development. It is proposed that 1% of the residential cycle parking spaces provided will allocated for cargo bikes. These spaces are dispersed throughout the development and are detailed in the overall scheme layout drawings. They include for both short and long stay use.

5.8.4 The proposed cycle parking provision for the non-residential element of the proposed development is set out in Table 5.3. The proposed non-residential cycle parking is far in excess of the DLRCC requirements. This will ensure that there is more than sufficient cycle parking to meet the needs of the proposed development.

Table 5.3: Proposed Non-Residential Cycle Parking Provision

Non-residential Cycle Parking	Gross Floor Area (GFA)	DLRCC Minimum Cycle Parking Standards			DLRCC Minimum Cycle Parking Requirements		Proposed Cycle Parking Allocation	Proposed Cycle Parking Provision
		Short Stay (Minimum 2no. Spaces)	Long Stay (Minimum 2no. Spaces)	Assumed Staff	Short Stay (Minimum 2no. Spaces)	Long Stay (Minimum 2no. Spaces)	Short Stay (2.5 x DLRCC Min. Standards)	Long Stay (3 x DLRCC Min. Standards)
Café	78sq. m GFA	1 per 100sq. m GFA	1 per 5 Staff	10	2	2	5	6
Medical	245sq. m GFA	1 per 2 Consultation Rooms	1 per 5 Staff	15	2	3	6	9
Retail (Blocks 3 & 7)	1112 sq. m GFA	1 per 100sq. m GFA	1 per 5 Staff	50	11	10	28	30
Restaurant	307 sq. m GFA	1 per 100sq. m GFA	1 per 5 Staff	20	3	4	8	12
Community	1684 sq. m GFA	1 per 100sq. m GFA	1 per 5 Staff	23	17	5	43	14
Creche	463 sq. m GFA	1 per 10 Children	1 per 5 Staff	10	8	2	20	6
Total Non-residential Cycle Parking					**43**	**26**	**110**	**77**
Combined Short and Long Stay					**69**		**187**	

5.8.5 There are a number of providers of public bike schemes in Dublin at present. The “dublinbikes” scheme operates in central areas of the city. “Bleeperbike” operates a dock less scheme, which means they can use existing Sheffield stands, within a designated area. Moby e-bikes, which are battery power assisted, allows cyclists to cover longer distances. Shared bike schemes are generally operated under licence from the local authority.

5.8.6 A public bike share scheme is proposed to be provided as part of the proposed development. These will be located near the centre of the proposed development and at locations where demand for shared bikes is likely to be greatest. The bike share spaces will be located within the areas proposed for taking in charge.

5.8.7 The LDA is required to tender for any public bike schemes and as the scheme may need to be licenced by DLRCC it is proposed that the location and operation of the public bike share scheme will be agreed with DLRCC prior to the occupation of any of the proposed development.

5.8.8 The use of the bike share and cargo bike schemes will be monitored and reviewed and additional bike spaces can be provided if deemed necessary.

5.9 Car Park Management Strategy

5.9.1 The car parking spaces will be allocated by the management company at the time units are allocated or occupied. The car parking will be managed centrally and will be tied to contracts.

5.9.2 Generous amounts of unallocated car parking is also provided, to accommodate occasional car users or visitors to the development.

5.9.3 The commercial spaces will be available for these uses exclusively during trading hours. Outside these times the management company will allocate some of these spaces for use as overnight car parking for residents that occasionally use a car. The use of shared car parking is an efficient and sustainable use of resources.

5.9.4 To determine if overspill car parking does arise in adjacent areas it is proposed that a Before and After car parking study of the adjacent residential areas be undertaken. If any parking issues are identified, then the management company will engage with DLRCC in consultation with local residents. Car parking controls in such areas could then be introduced if required.

6 TRAFFIC SURVEY & SITE APPRAISAL

6.1 Overview

6.1.1 For the Tri-Partite traffic assessment, some historic traffic data pre-March 2020 was sourced to provide traffic volumes on the adjoining road network.

6.1.2 ILTP obtained traffic count survey data available for some junctions on Dundrum Road in the vicinity of the proposed development, including the existing CMH site access junction.

6.1.3 ILTP commissioned new additional traffic counts along the Dundrum Road in November 2021, which were more comprehensive and detailed compared to the previous data. This more localised data was then compared with pre-covid traffic data and appropriately factored to account for any likely covid distortions. This provided a robust data set on which to undertake a traffic assessment of the proposed development.

6.2 Summary of Traffic Count Surveys

6.2.1 The traffic county survey data undertaken by specialist firm IDASO for ILTP for junctions on the are shown in Figure 6.1.

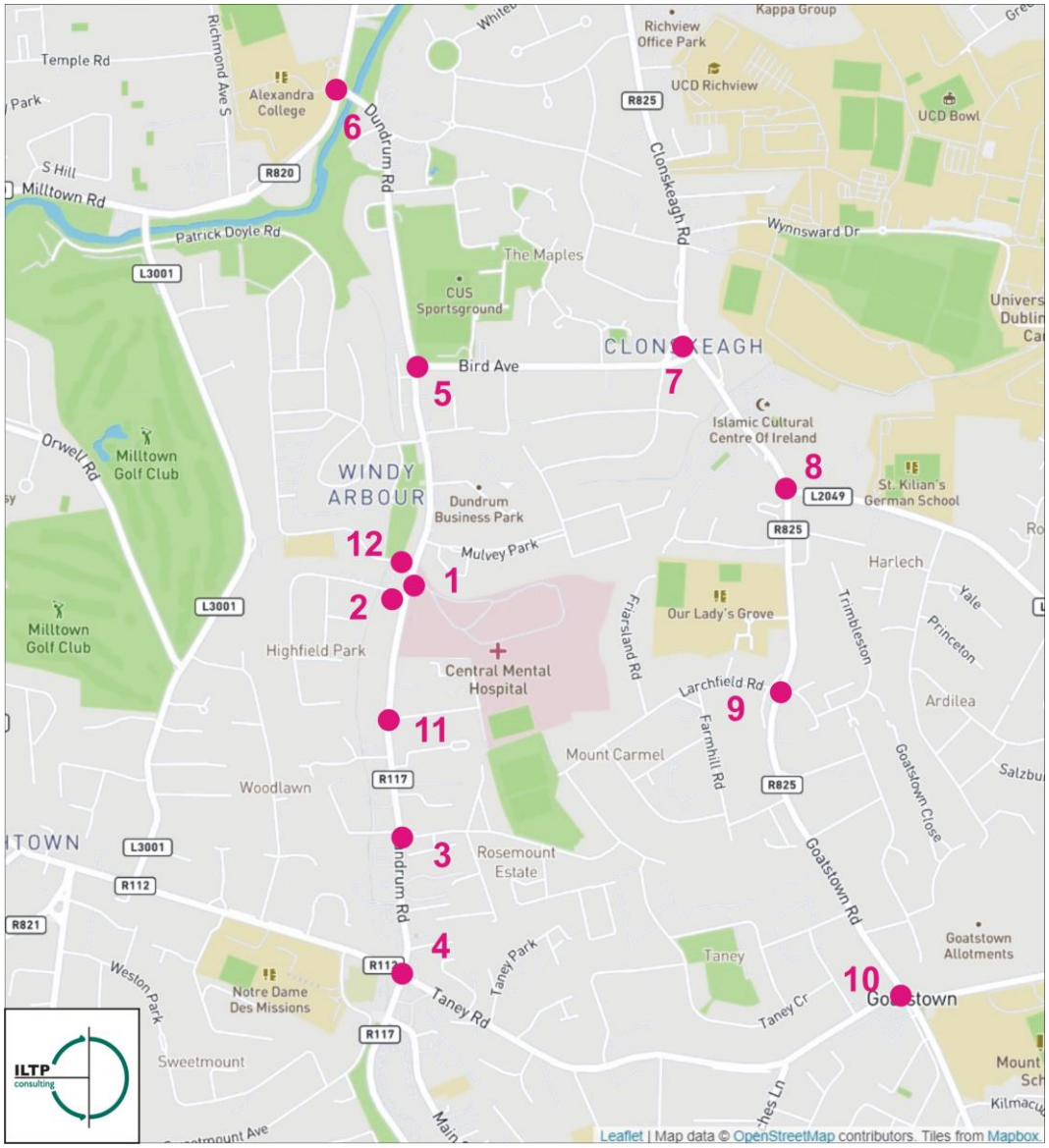


Figure 6.1: Location of Traffic Count Survey Data Obtained for the Proposed CMH SHD Lands

6.2.2 The traffic data collected is summarised in Figure 6.2 for the AM peak hour.

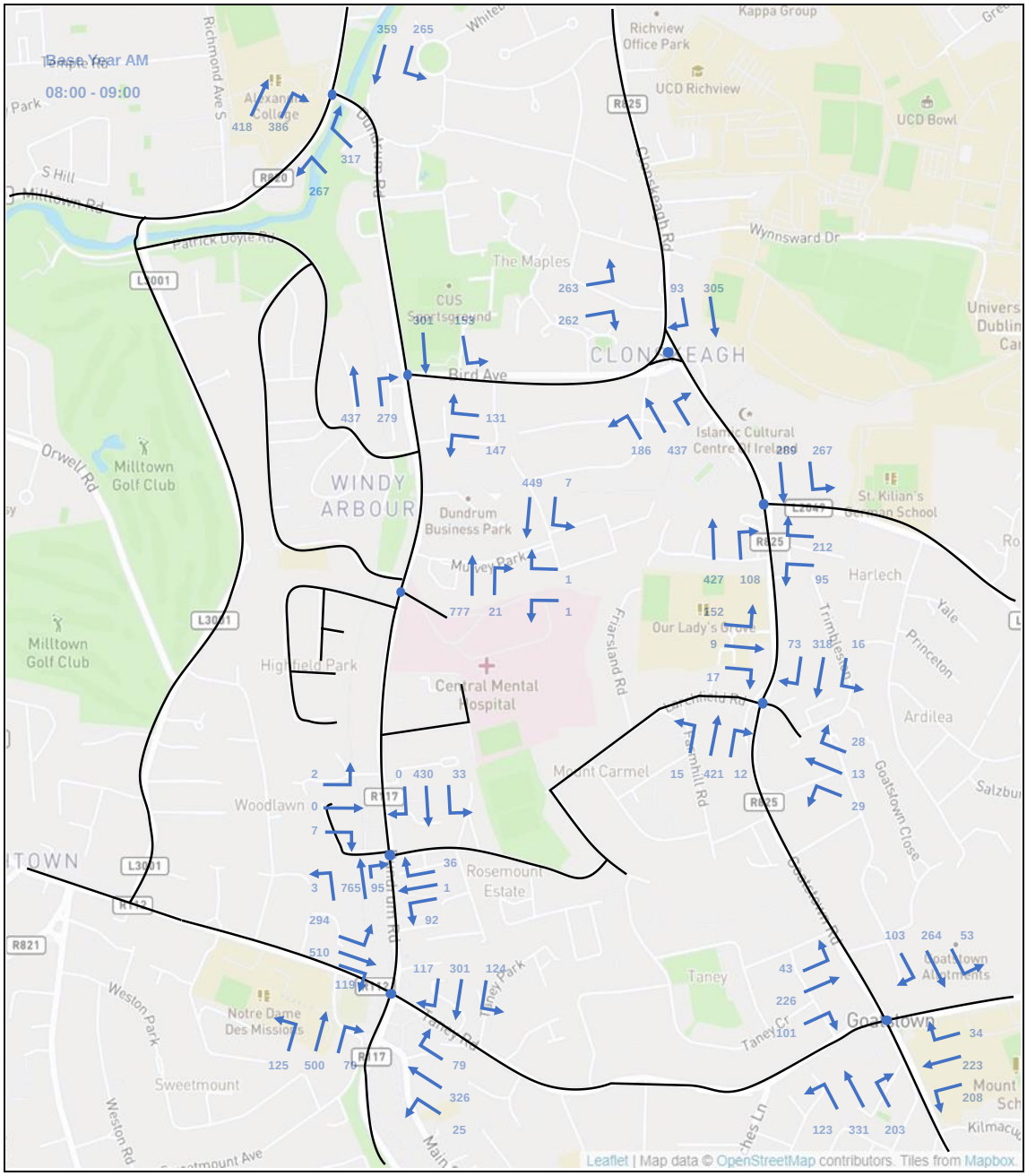


Figure 6.2: 2021 Base Year AM Peak Hour Turning Counts

6.2.3 The corresponding turning counts and flows for the PM 17:00 – 18:00 peak hour are shown in Figure 6.3 for the main junctions.

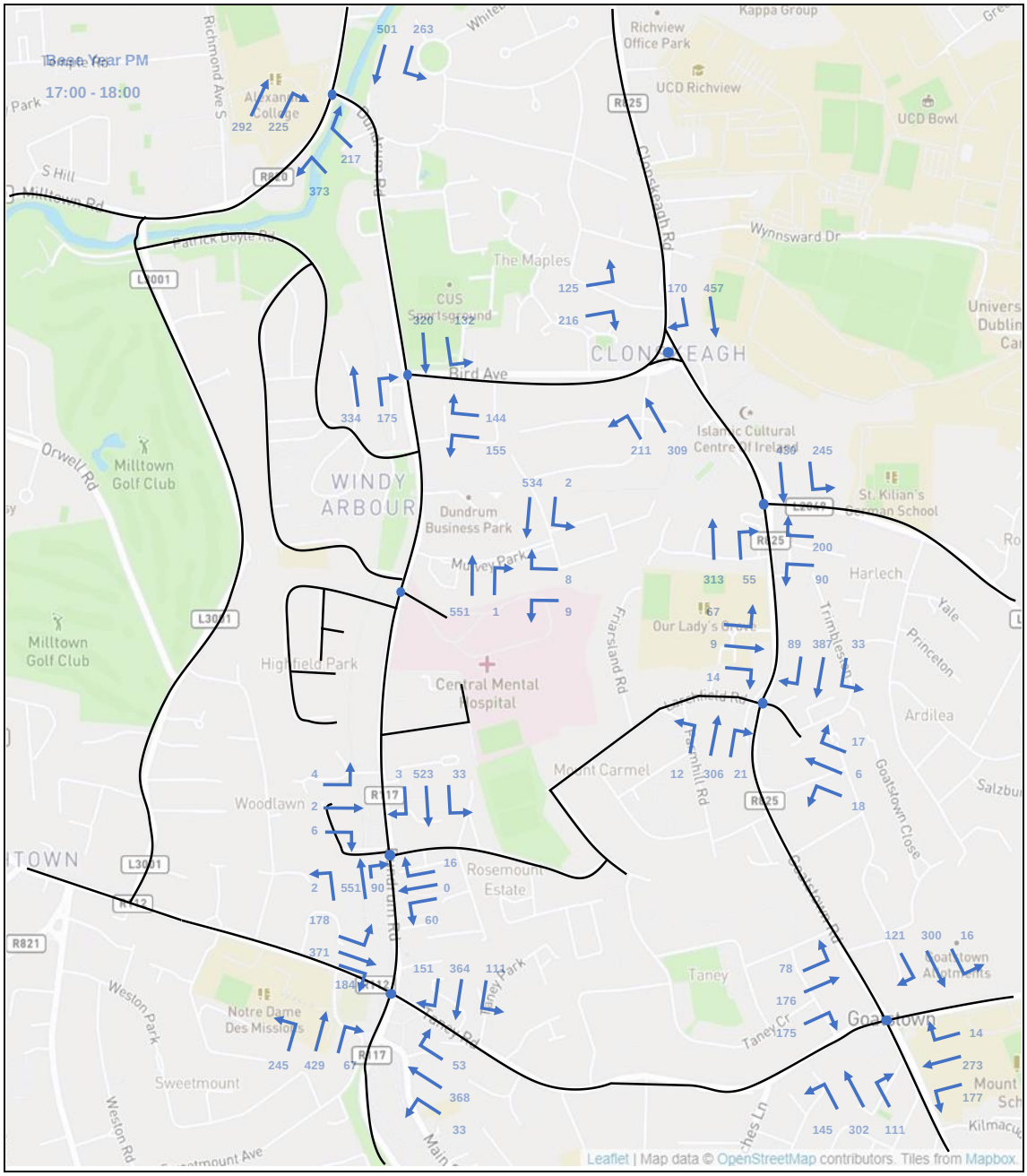


Figure 6.3: 2021 Base Year PM Peak Hour Turning Counts

6.3 Traffic Data Comparison and Adjustment

6.3.1 The November 2021 traffic data was compared with earlier traffic data collected in 2019 to check for data consistency. The results show that at peak hour periods traffic flows were slightly lower than those recorded in 2019 as a likely result of covid-19 changes. ILTP applied a 4% growth factor to the November 2021 data, which was used as the baseline traffic for assessment purposes. These adjusted flows compared to the 2019 data are summarised in Table 6.1. The traffic assessment using either data set would therefore produce an almost identical result, however, as the 2021 data was more comprehensive it was decided to use this data but appropriately factored.

Table 6.1: Traffic Survey Data Comparison

Total PCUs Through Junction

Junction		Survey Date Nov-21	Feb-19	% Change Feb-19 to Nov-21
CMH Access	AM	1294	1366	-5.27%
	PM	1109	1125	-1.42%
Rosemount/Frankfort Park	AM	1515	1521	-0.39%
	PM	1307	1349	-3.11%
Highfield Park	AM	1326	1389	-4.54%
	PM	1146	1147	-0.09%

Adjusted Data for Covid-19 Fluctuations

		Nov-21 + 4%	Feb-19	% Change Feb-19 to Nov-21
CMH Access	AM	1346	1366	-1.48%
	PM	1153	1125	2.52%
Rosemount/Frankfort Park	AM	1576	1521	3.59%
	PM	1359	1349	0.76%
Highfield Park	AM	1379	1389	-0.72%
	PM	1192	1147	3.91%

6.3.2 In terms of future traffic growth rates, TII has general traffic projections for the period 2016 – 2050. There are different growth rates for different areas and do not distinguish between central areas and those well serviced by high frequency public transport, so they are not appropriate to apply in locations such as the subject land.

6.3.3 A recent Department of Transport publication, **Transport Trends 2020**, sets out the overall trends of transport movement for the state. This report, while acknowledging that traffic on national roads is increasing, also shows that traffic on the wider road network is decreasing overall. It also shows that traffic has declined in both 2018 and 2019 from its peak in 2017 at 35.5bn kilometres.

> *"The total number of vehicle kilometres driven on Irish Roads currently show a downward trend..."*

6.3.4 Due to the subject site also being in a long-established urban area with a high degree of public transport provision it is not expected that growth in background traffic levels for the future year assessments which is supported by evidence and policy at all levels.

6.3.5 Furthermore, current Government modal shift targets to more sustainable forms of transport are likely to yield a further drop in background traffic in the short to medium term, particularly where frequent and reliable public transport services are in operation within a convenient short walking distance, as is the case with the proposed development.

6.3.6 Working for home has significantly increased in recent times and this trend is set to continue as Government legislation to support working from home is planned. This is likely to further reduce traffic movements at peak periods and particularly in areas well served by sustainable travel modes.

6.4 Pedestrian and Cycle Survey Results at Columbanus Road /Dundrum Road

6.4.1 Figure 6.4 shows the total of pedestrian movements in the vicinity of the proposed development, on Dundrum Road in the AM and PM peak hours.

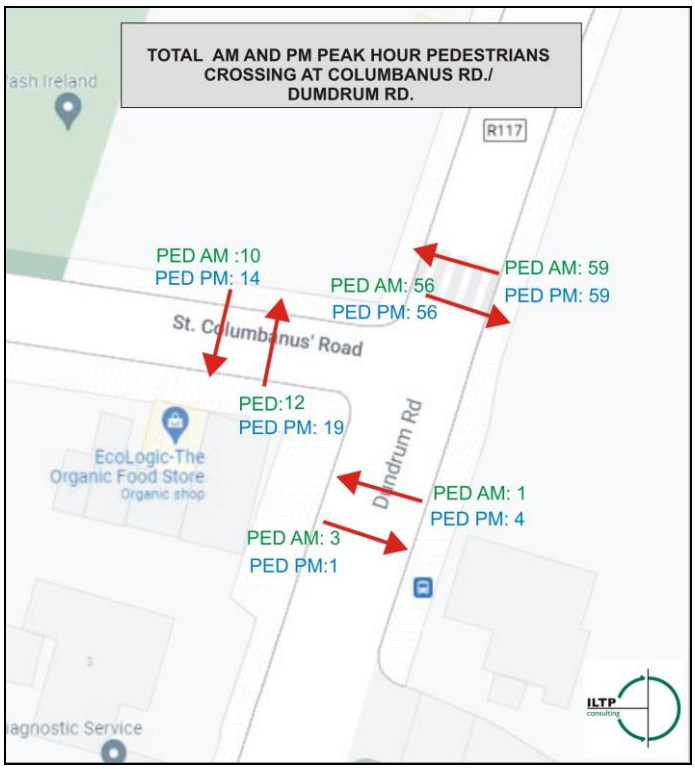


Figure 6.4: Total AM and PM Peak Hour Pedestrians Movements

6.4.2 The results show that the vast majority of pedestrians crossing Dundrum Road use the existing controlled crossing facility.

6.4.3 The existing cycle movements through the junction are shown in Figure 6.5. This shows a tidal cycle flow pattern with reasonable levels of cyclists using Dundrum Road at present.

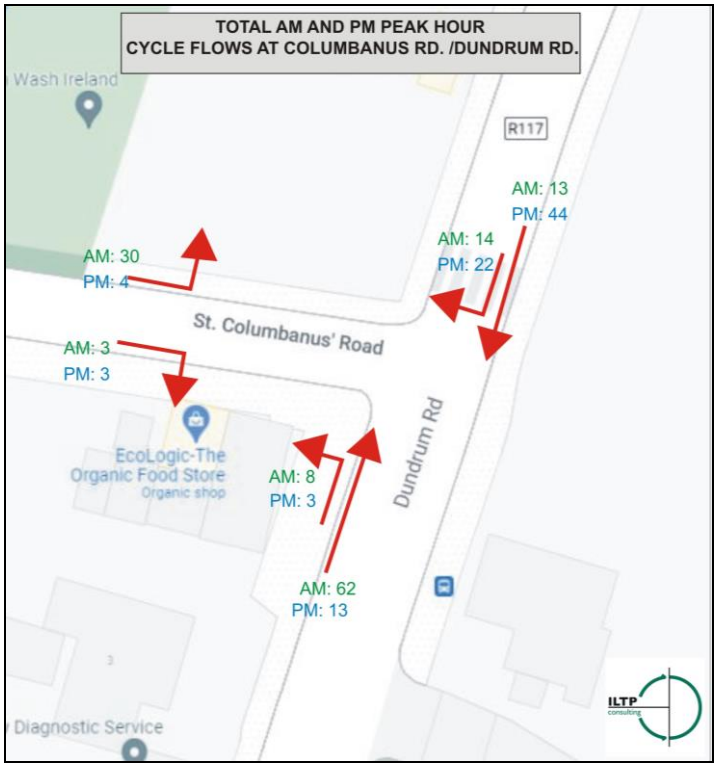


Figure 6.5: Total AM and PM Peak Hour Cycle Flows

6.4.4 The proposed internal cycle and pedestrian routes included in the proposed SHD application will offer many existing cyclists and pedestrians an alternative dedicated route through the development.

6.5 Cumulative Traffic Impact of other Permitted Developments

6.5.1 There are two permitted SHD developments along Dundrum Road, Mount St. Mary's SHD and Frankford Castle SHD and one that was recently submitted for planning permission, the Sommerville SHD. ILTP has reviewed the TTAs for these developments.

6.5.2 The Mount St Mary's SHD TTA shows very little additional traffic along Dundrum Road towards the subject site and the additional traffic associated with this development in the vicinity of the proposed development is insignificant. The Mount St. Mary's TTA forecasted an additional 16 two-way trips along Dundrum Road in the AM peak.

6.5.3 The Frankford Castle SHD TTA also forecasted an additional 16 two-way trips along Dundrum Road in the vicinity of the subject site in the AM peak.

6.5.4 The Sommerville SHD TTA also forecasted an additional 7 two-way trips along Dundrum Road in the vicinity of the subject site in the AM peak.

6.5.5 The recent traffic surveys found that the existing CMH currently generates 23 two-way trips along Dundrum Road in the AM peak, which will be removed with the closure of the existing facility. Therefore, the net overall increase of the combined impacts is approximately 16 two-way movements along Dundrum Road adjacent to the proposed development or approximately 1% of recorded two-way flows. This represents a very minor overall increase in traffic. This is summarised in Table 6.2.

6.5.6 To account for this cumulative traffic impact ILTP increased the traffic flows by a further 3%.

Table 6.2: Cumulative Impact of Adjacent Developments

	Additional Two-way Trips Immediately South of Southern Access - Vehicles Per Hour	
	AM Peak	**PM Peak**
ABP31013821 (Mount St. Mary's SHD)	16	18
ABP31128721 (Highfield/Frankfort SHD)	16	5
ABP312935-22 (Sommerville SHD)	7	10
Total Additional Trips	**37**	**33**
Existing Peak Hour Flows	1323	1271
Percentage Increase	2.9%	2.6%
Less Existing CMH Traffic	(39-23) 16	(33-11) 21
Net Increase	**1.2%**	**1.6%**

6.5.7 It should be noted that what are termed trips, for assessment purposes, are more accurately trip ends as each trip has both an origin and a destination. If all trip ends from new developments were assumed to be new trips, and this was applied to all developments, then this would result in the doubling of forecasted trips on the network.

6.5.8 As set out earlier in the report, the overall evidence shows that new residential developments in areas well served by public transport, such as the subject site, result in reductions in traffic flows, coupled with an increased use of sustainable travel modes.

7 TRIP GENERATION AND DISTRIBUTION FOR THE PROPOSED DEVELOPMENT

7.1 Introduction

7.1.1 The overall trip generation rates were derived for each element of the development to produce trip rates. For development that have different uses then some internal trips will also be generated depending on the mix of uses proposed.

7.2 Trip Generation Rates

7.2.1 The proposed development will generate an increased level of traffic on the local road network and demand for public transport.

7.2.2 To calculate the likely increase in traffic volumes trip rates were established for each proposed land use type and quantum using ILTP's own experience of comparable developments of similar size and nature in Ireland, and with reference to the TRICS (Trip Rate Information Computer System) database.

7.2.3 Using TRICS, ILTP estimated the total number of person-based trips each individual element of the development is likely to produce and combined to produce gross trip rates. These person base trips also allowed us to calculate public transport demands to and from the new development.

7.3 Assumed Mode Share

7.3.1 The proposed development is in an area well served by public transport and higher mode share by public transport can be anticipated. The CSO 2016 data illustrated in Figure 7.1 shows approximately 58% of trips in Dublin were made by car and the balance by sustainable travel modes.

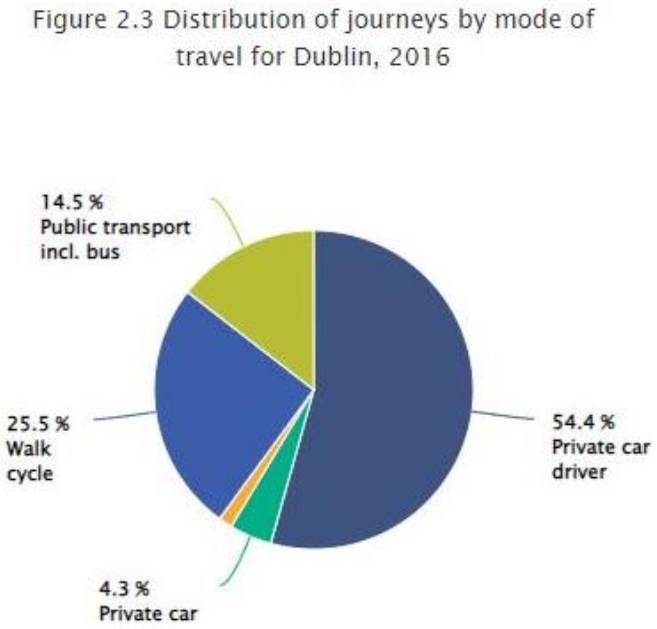


Figure 7.1: Extract from 2016 CSO Data – Distribution of Travel by Mode in Dublin Area

7.3.2 For locations such as the subject site, a lower trip rate should be assumed given its location and accessibility to public transport. ILTP have assumed a car mode share of 50% of all movements to and from the proposed development. This is consistent with findings of the Dundrum LAP Issues Paper (2018) which states the following on mode share:

> *"Dundrum is relatively well served by public transport, with the opening of the Luas Green Line transforming the connectivity of the Town with the City Centre and Sandyford/Cherrywood—and more recently with the north-west Inner City.*
>
> *The area has a broadly positive modal share of commuters who use public transport/walking and cycling.*
>
> *For residents of Dundrum, **10%** walk to work (higher than both the State and County average) **7%** cycle (more than twice the national rate) and **34%** use public transport (compared to County rate of **23%** and State rate of just **9%**). All told, more than **50%** of residents of Dundrum commute by sustainable modes.*
>
> *Those who commute to Dundrum to work have a similarly positive modal split—**13%** walk, **4%** cycle and **26%** use public transport. The rate of cycling to Dundrum is, however, lower than the County average of **6%**."*

7.3.3 ILTP applied a modal split to calculate the likely number of non-car-based trips also, based on existing walking, cycling and public transport facilities. The final modal split was calculated based on a combination of data from TRICS and with reference to the CSO data and is as follows:

- Car (Driver) 44.6%
- Car (Passenger) 5.4%
- Pedestrian & Cycle 20%
- Bus 5%
- Luas 25%

7.3.4 Figure 7.2 shows a graphical breakdown of the mode share distribution, without the mitigation measures as set out later in the MMP section of the report.

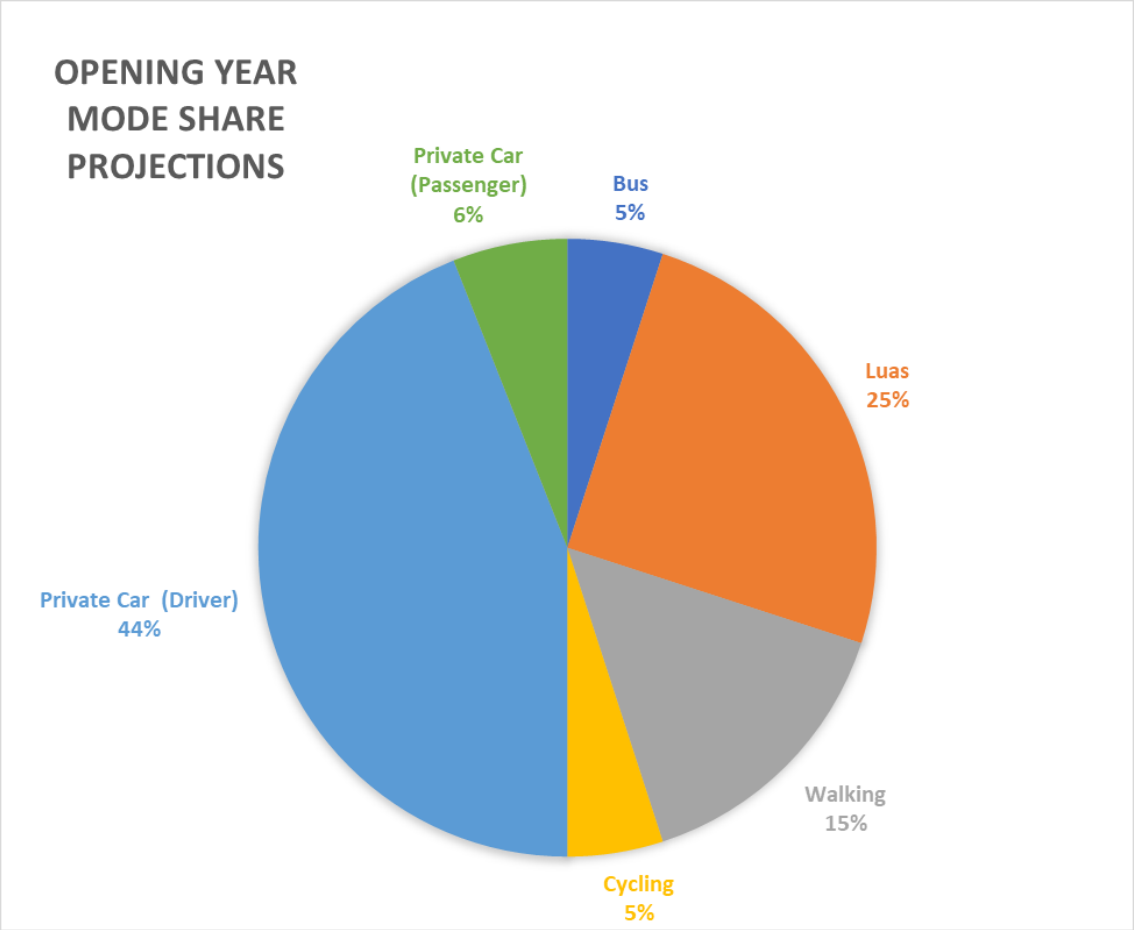


Figure 7.2: Opening Year Mode Share Projections

7.3.5 The assumed car mode share used in the traffic assessment is likely to be lower than that generated by the actual development, due to the lower car parking ratio proposed in the development. Also, the mode share assumption does not take into consideration the recent improvement to the public transport service in the area. The walk and cycle route through the development is also likely to increase walk and cycle use by existing residents of the area. Therefore, the assumed vehicular trip rates used in the traffic capacity assessment are robust assessments and represent a robust assessment.

7.3.6 The proposed non-residential aspect of the development will cater primarily for residents of the proposed development. Some additional staff movements may be generated, however, the majority of which would be likely to be generated outside of the traditional AM and PM peak periods.

Table 7.1: Proposed Total Person Based Trip Rates for Proposed Development

Type	Rate Type	Number of Units	AM Rate		PM Rate		AM Trips		PM Trips	
			Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep
SHD										
Apartments	**per Unit**	940	0.1	0.493	0.347	0.169	94	463	326	159
Houses	**per Unit**	37	0.205	0.767	0.602	0.289	8	28	22	11
S34 Application										
Apartments	**per Unit**	40	0.103	0.52	0.403	0.191	4	21	16	8
Houses	**per Unit**	31	0.202	0.772	0.611	0.281	6	24	19	9

Non-Residential	Rate Type	GFA (sqm)	AM Rate		PM Rate		AM Trips		PM Trips	
SHD			Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep
Creche	**per 100sqm**	**463**	6.203	2.278	2.373	4.525	29	11	11	21
Retail Cluster	**per 100sqm**	**1112**	6.966	6.875	8.049	8.31	77	76	90	92
Restaurant/Café	**per 100sqm**	**307**	3.093	1.031	5.255	2.801	9	3	16	9
Community	**per ha.**	**0.168ha**	79.452	13.014	82.353	46.324	13	2	14	8
Medical	**per 100sqm**	**245**	3.822	1.549	1.918	3.401	9	4	5	8
S34 Application										
Enterprise	**per 100sqm**	**5566**	1.886	0.123	0.128	1.807	105	7	7	101

7.3.7 Given the mix of uses, not all trips will be external as many of the proposed facilities will be used by the residents. ILTP have assumed that internal trips to and from the creche, retail uses, and other facilities would account for 15% of the overall residential trips and have assumed that the external trips would account for 85%. Similarly, the trips to and from the retail and the other facilities provided on-site would be mainly used by the local residents, but 20% were assumed to be external trips. The trip rates used for the enterprise centre are assumed to be 90% external with 10% coming from within the development.

7.3.8 The mode share assumption was then applied to the overall external vehicle trip forecasts as set out in Table 7.2.

Table 7.2: Final External Vehicular Based Trip Generation for Proposed Development

Type	AM Trips		PM Trips	
	Arr	Dep	Arr	Dep
SHD				
Apartments	36	176	124	60
Houses	3	11	8	4
S34 Application				
Apartments	2	8	6	3
Houses	2	9	7	3
Total Residential	42	204	146	71
Non-Residential				
SHD				
Creche	3	1	1	2
Retail Cluster	7	7	8	8
Restaurant/Café	1	1	1	1
Community	1	1	1	1
Medical	1	1	1	1
S34 Application				
Enterprise	42	3	3	40
Total Non-Residential	55	14	16	53
SHD	51	197	145	77
S34	46	20	16	47
Total	**97**	**217**	**161**	**123**

7.3.9 Overall the Trip Generation assessment of the masterplan lands yielded an estimate of an additional 97 no. inward and 217 no. outward vehicular trips for the AM peak hour (08:00 – 09:00). An additional 161 no. inward vehicular trips and 123 no. outward vehicular trips were estimated for the PM peak hour (17:00 – 18:00).

7.3.10 The traffic survey results show that the AM and PM peaks are the times of the day when traffic volumes are at their highest. It can be assumed that if the road network can perform effectively at these times, then it will meet all demands placed upon it.

Table 7.3: Final External Trip Generation for Proposed Development By Mode of Travel

	Mode Share	AM		PM	
		Arr	Dep	Arr	Dep
Total External Person Trips	100%	217	482	359	276
Bus	5%	11	24	18	14
Luas	25%	54	121	90	69
Walking	15%	33	72	54	41
Cycling	5%	11	24	18	14
Private Car (Driver)	44.6%	97	217	161	123
Private Car (Passenger)	5.4%	12	26	19	15

7.3.11 Overall the Trip Generation assessment of the masterplan lands yielded an estimate of an additional 65 no. inward and 145 no. outward public transport trips for the AM peak hour (08:00 – 09:00). An additional 108 no. inward public transport trips and 83 no. outward public transport trips were estimated for the PM peak hour (17:00 – 18:00).

Table 7.4: Final External Trip Generation for Proposed Development By Mode of Travel Design Year

	Mode Share	AM		PM	
		Arr	Dep	Arr	Dep
Total External Person Trips	100%	217	482	359	276
Bus	10%	22	48	36	28
Luas	25%	54	121	90	69
Walking	18%	39	87	65	50
Cycling	10%	22	48	36	28
E-mobility	3%	7	14	11	8
Private Car (Driver)	27%	58	129	96	74
Private Car (Passenger)	3.2%	7	16	12	9
Car Share Schemes	4.0%	9	19	14	11

7.4 Trip Distribution

7.4.1 Given the central location of the proposed development and the wide range of services and facilities in the area, the vehicular traffic generated by the development is likely to dissipate across the local road network. ILTP also examined the traffic movements to and from the adjacent Annaville Park when determining the trip distribution. In the AM Peak, approximately 40% of movements are to and from Dundrum Road north of Annaville Park with 60% of movements going to and from Dundrum Road south of Annaville Park. This pattern is repeated in the PM Peak.

7.4.2 The trip distribution for the proposed development is as follows:

Vehicles departing

- 57% estimated to turn left onto Dundrum Road and 43% to turn right.

Vehicles arriving

- 57% of total traffic arriving to the Site is estimated to arrive from the south with 43% estimated to arrive from the north.

7.4.3 Vehicles departing the site will then dissipate throughout the local road network through a number of different junctions. The total estimated Trip Distribution for the proposed development during the morning 08:00 – 09:00 and evening 17:00 – 18:00 peak hours is summarised in Figure 7.3.

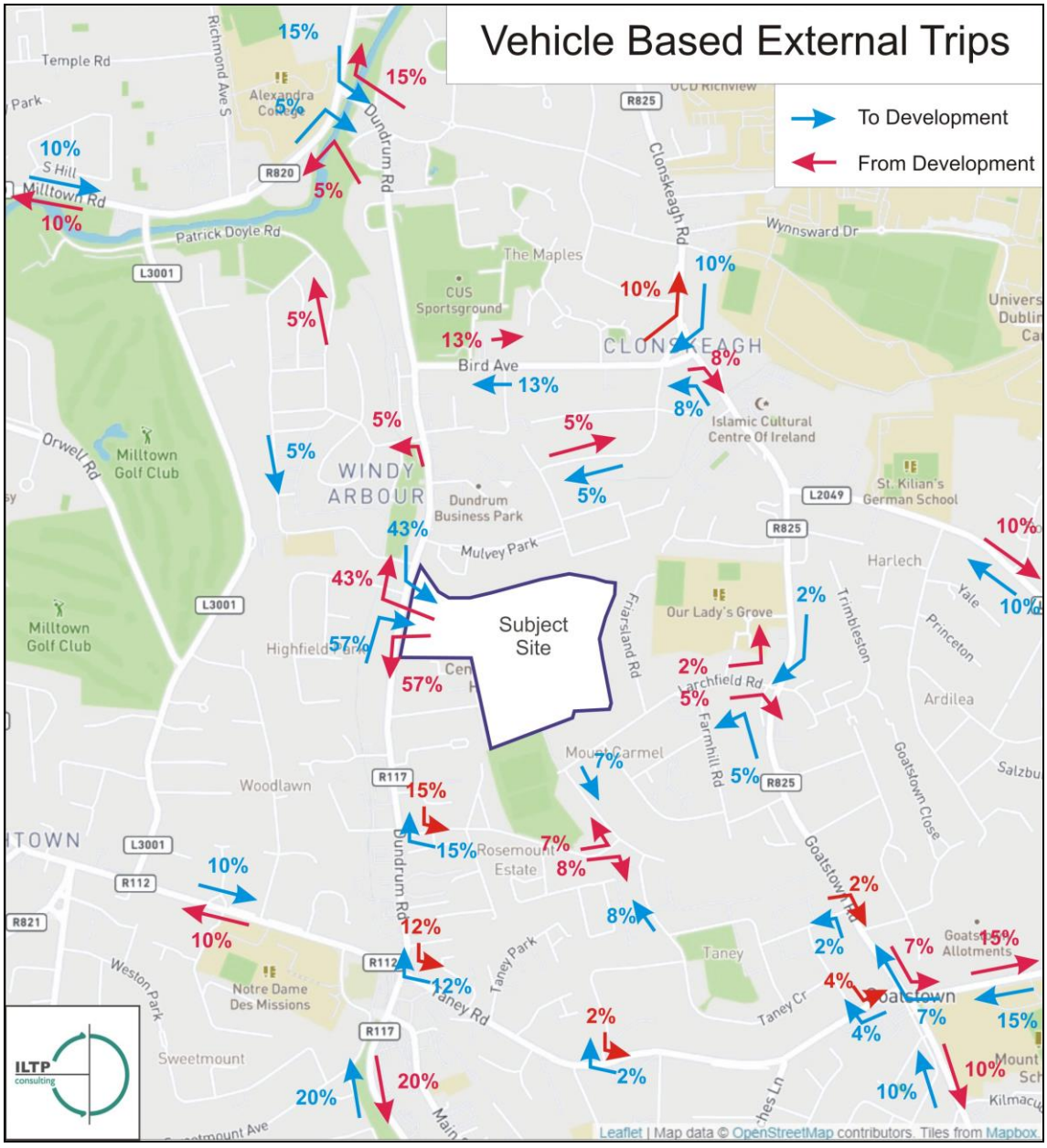


Figure 7.3: Projected Trip Distribution for Proposed Development

8 TRAFFIC MODELLING RESULTS AND TRANSPORT CAPACITY ASSESSMENT

8.1 Opening Year and Design Year Scenarios

8.1.1 For EIAR purposes the Opening Year of the proposed development is projected to be 2024, and the corresponding Design Year is taken to be 2039, which is 15 years after the Opening Year.

8.1.2 As set out above, for the 2039 Design Year it is assumed that the 2024 Opening Year traffic volumes both without and with the proposed development would persist.

8.2 Traffic Impact Assessment of Adjoining Roads and Junctions in context of Traffic Impact Assessment Thresholds

8.2.1 The projected increases in traffic as a result of the proposed development have been assessed with regard to the vehicle movement threshold levels above which a Transport Assessment is automatically required, as defined in the *NRA Traffic and Transport Assessment Guidelines* (May 2014), which include:

> *"Traffic to and from the development exceeds 10% of the traffic flow on the adjoining road.*
>
> *Traffic to and from the development exceeds 5% of the traffic flow on the adjoining road where congestion exists, or the location is sensitive."*
>
> Residential development in excess of 200 dwellings.
>
> Retail and leisure development in excess of 1,000m^2*."*

8.2.2 From the Trip Generation and Trip Distribution projections set out above, the additional traffic flows and turning movements on the adjoining road network could be estimated. As shown in Table 8.1, it is estimated that the proposed development will increase two-way flows on the adjoining Dundrum Road by up to 357 no. vehicles during the AM peak hour, and 340 no. vehicles during the PM peak hour.

Table 8.1: Projected Increases in Two-Way Traffic Flows from Proposed Development

Link	Estimated 2024 Opening Year Peak Two-Way Traffic Count Volumes Without Proposed Development		Estimated 2024 Opening Year Peak Two-Way Traffic Count Volumes With Proposed Development		% Increase	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
R117 North of Existing Access	1308	1267	1443	1389	10.32%	9.63%
R117 South of Existing Access	1323	1271	1410	1341	6.58%	5.51%

8.2.3 This gives a projected 2024 Opening Year peak hour increase of up to 14% over background traffic flows on Dundrum Road.

8.2.4 The projected additional traffic resulting from the proposed development on the adjoining junctions was assessed, as per Table 8.2.

Table 8.2: Projected Increases in Traffic Flows from Proposed Development through Adjoining Junctions in Vicinity of Proposed Development Access

Junction		Estimated 2024 Opening Year Total Traffic Count Volumes through Junction - Without Proposed Development		Estimated 2024 Opening Year Total Traffic Count Volumes through Junction - With Proposed Development		% Increase through Junction	
		AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
R117	Bird Ave	1549	1348	1640	1420	5.87%	5.34%
R117	Frankfort Park	1571	1380	1709	1475	8.78%	6.88%
R117	Highfield	1367	1184	1399	1213	2.34%	2.45%
R117	Mulvey Park	1336	1154	1469	1273	9.96%	10.31%
R117	Annaville Park	1344	1159	1511	1321	12.43%	13.98%
R117	Taney Road	2771	2733	2903	2852	4.76%	4.35%
R117	Milltown Road	2153	2003	2216	2059	2.93%	2.80%

8.2.5 The proposed future development is projected to increase traffic through the R117-Bird Avenue junction, R117-Frankfort Park, R117-Mulvey Park junction and R117-Annaville Park by up to 5.87%, 8.78%, 10.31% and 13.98% respectively, which exceeds this threshold.

8.2.6 It is, therefore, considered appropriate that the R117-Bird Avenue junction, R117-Frankfort Park be assessed to ensure they have adequate capacity to accommodate the proposed development. For completeness, and to ensure the nearest adjoining junctions on both sides of the proposed development access are assessed. While the increase in traffic through the R117-Highfield junction is sub-threshold, it was still deemed appropraite to assess this junction due to its proximity to the proposed access junctions. Other smaller junctions and accesses along Dundrum Road did not require detailed assessment as the traffic movement were small and therefore would continue to operate satisfactorily.

8.2.7 As shown in Table 8.2, the projected additional traffic from the proposed future development through the nearby R117-Milltown Road junction and R117-Taney Road junction is within the relevant 5% TII / NRA threshold for both the AM and PM peak traffic periods, and are therefore projected to have no material impact on this junction.

8.2.8 From the assessments presented in Tables 8.1 and 8.2 it is projected that additional traffic flows from the proposed development, beyond the junctions listed in Table 8.2, would dissipate to well below threshold levels.

8.2.9 The TTA also made no reduction to allow for the impacts of diverted or transferred trips, which would reduce the net traffic impact of the overall development. The further away from a development, the greater the reduction in net traffic impact due to diverted and transferred trips.

8.2.10 Therefore, no further Traffic Impact Assessment is proposed beyond the adjoining junctions included in Table 8.2.

8.3 Capacity Assessments of Proposed Development Access Junctions

8.3.1 In order to test the performance of the proposed access junction on Dundrum Road with the proposed development in place, a Picady analysis was conducted.

8.3.2 The Picady software package was used to calculate RFC (ratio of flow to capacity) factors for the approaches to the junction. This is often used to assess capacity of priority junctions. This measures the observed flow of a link against the theoretical capacity of the link. RFC is calculated thus;-

$$\% \text{ RFC} = \frac{\text{Observed Flow}}{\text{Link capacity}} \times 100$$

8.3.3 In transport Terms, RFC values of 85% or less are considered satisfactory, meaning at levels of RFC below 85% the junction is normally deemed to be operating within the design capacity and that no significant delays or queues arise.

8.3.4 For each junction three scenarios were assessed:

- Scenario A - 2021 Base Year (2021 Survey Results factored as per Table 6.1)
- Scenario B - 2024 Opening Year with Cumulative Impact of Other Permitted Developments
- Scenario C - 2024 Opening Year with Cumulative Impact and with Proposed Development Traffic

8.3.5 The peak hour traffic flows and turning movements as input into Picady, are shown in Figures 8.1 to 8.12 for Scenario A, Figures 8.13 to 8.24 for Scenario B and in Figures 8.25 to 8.36 for Scenario C.

8.3.6 The pedestrian crossing close to the proposed Northern Access Junction/St Columbanus Junction was included in the traffic model and pedestrian flows were also input into Picady model.

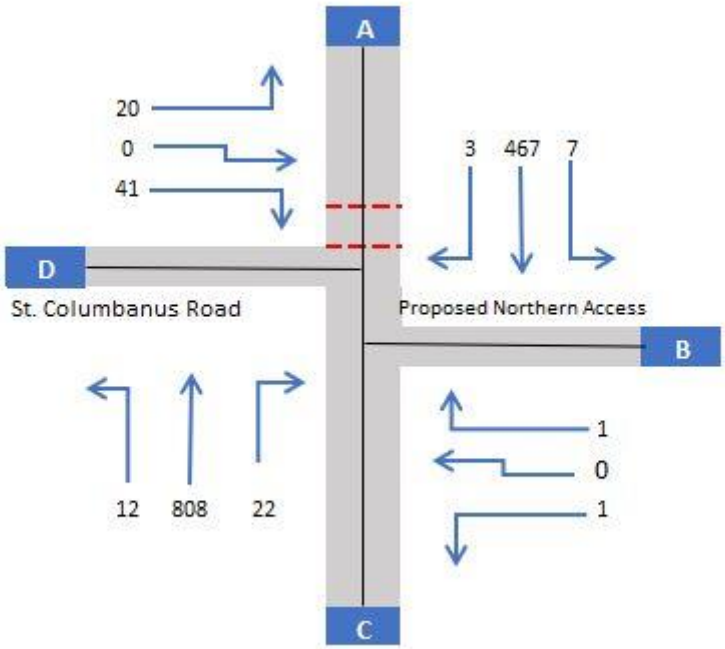


Figure 8.1: Picady Input for St. Columbanus Road/Northern Access Junction with Pedestrian Crossing included – AM Peak Hour – Scenario A

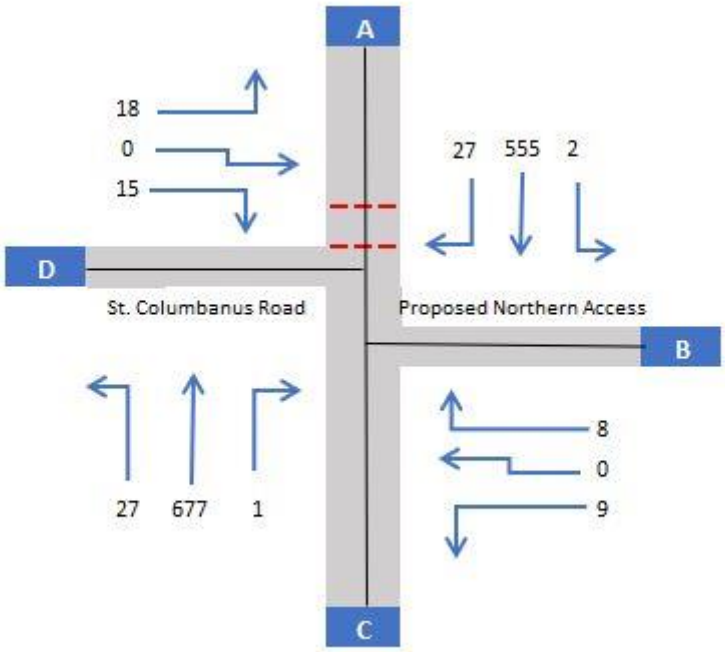


Figure 8.2: Picady Input for St. Columbanus Road/Northern Access Junction with Pedestrian Crossing included – PM Peak Hour – Scenario A

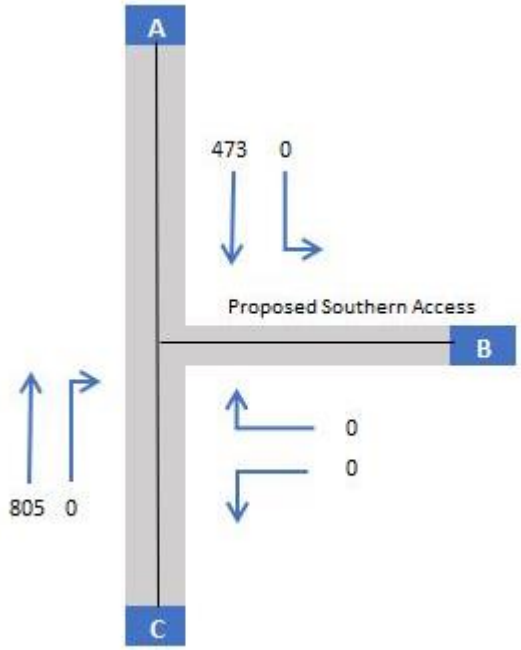


Figure 8.3: Picady Input for Proposed Southern Access Junction – AM Peak Hour – Scenario A

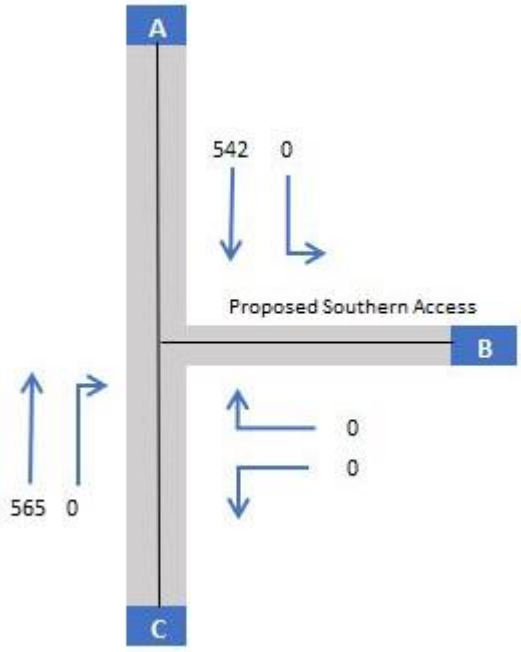


Figure 8.4: Picady Input for Proposed Southern Access Junction – PM Peak Hour – Scenario A

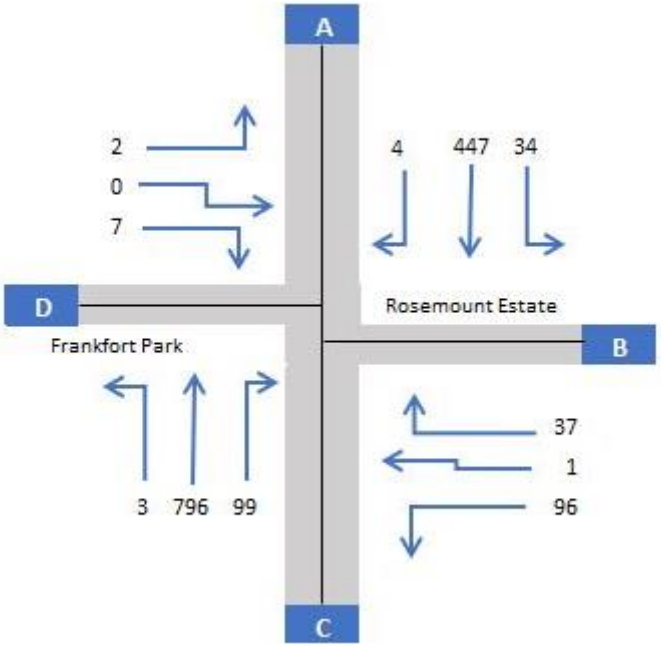


Figure 8.5: Picady Input for R117 – Frankfort Park - Rosemount Junction AM Peak Hour – Scenario A

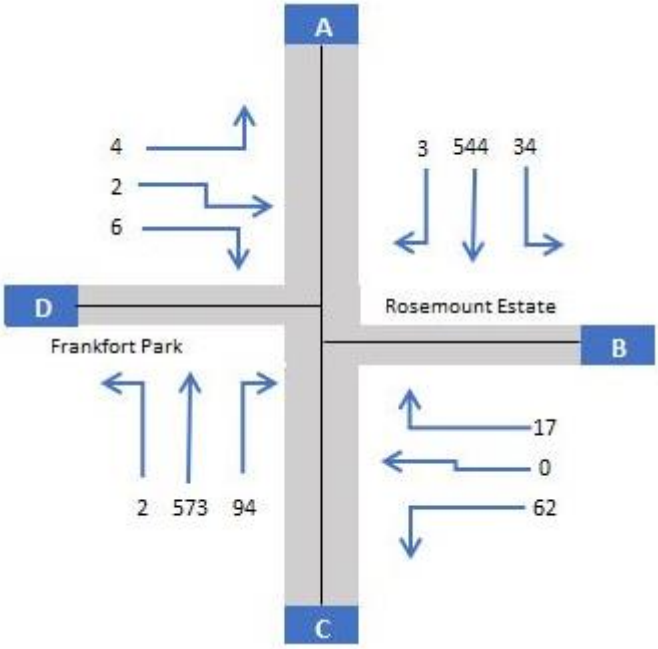


Figure 8.6: Picady Input for R117 – Frankfort Park - Rosemount Junction PM Peak Hour – Scenario A

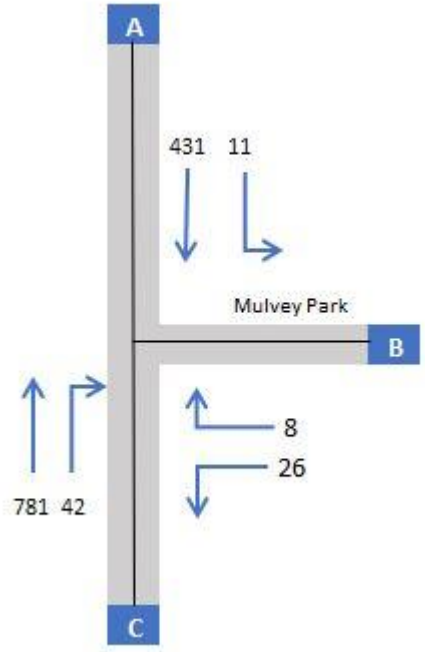


Figure 8.7: Picady Input for R117 – Mulvey Park Junction AM Peak Hour – Scenario A

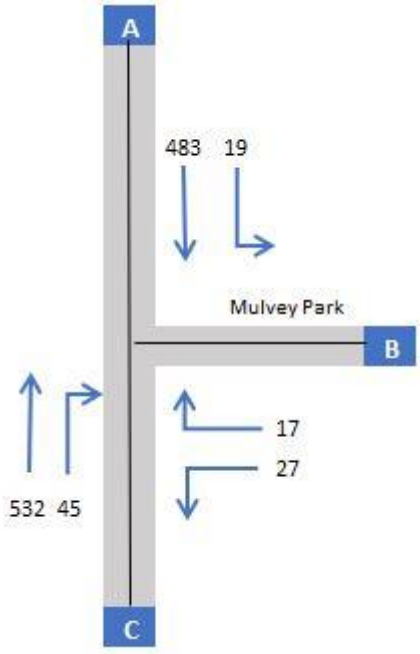


Figure 8.8: Picady Input for R117 – Mulvey Park Junction PM Peak Hour – Scenario A

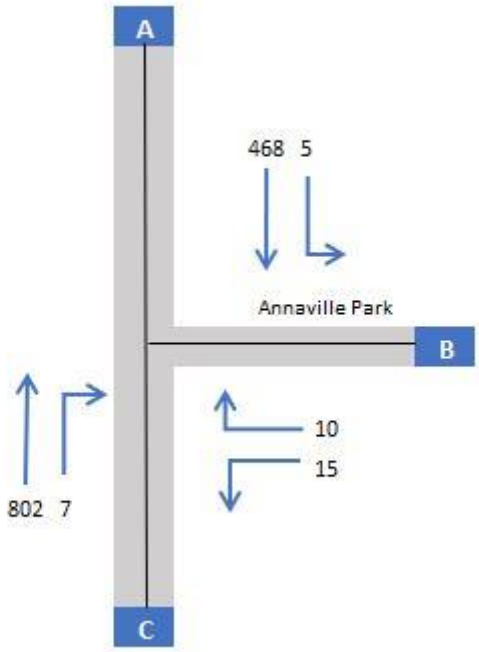


Figure 8.9: Picady Input for R117 – Annaville Park Junction AM Peak Hour – Scenario A

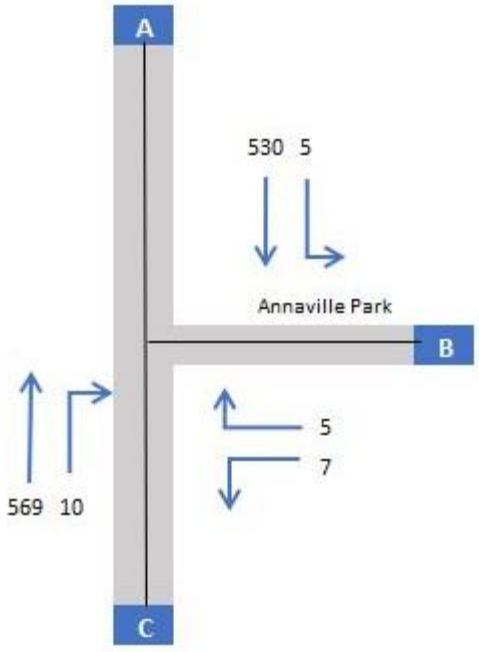


Figure 8.10: Picady Input for R117 – Annaville Park Junction PM Peak Hour – Scenario A

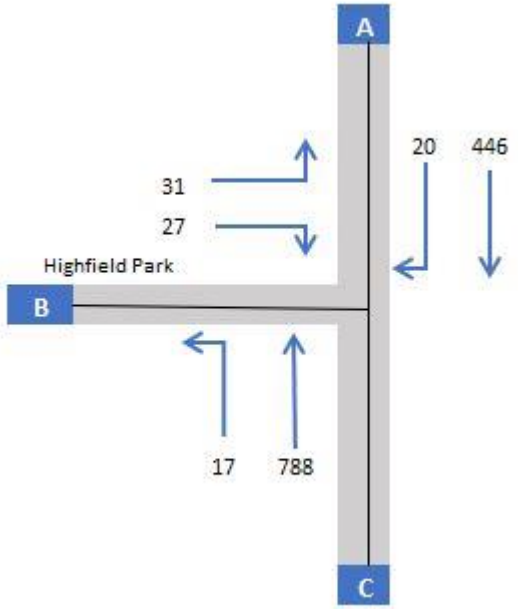


Figure 8.11: Picady Input for R117 – Highfield Junction AM Peak Hour – Scenario A

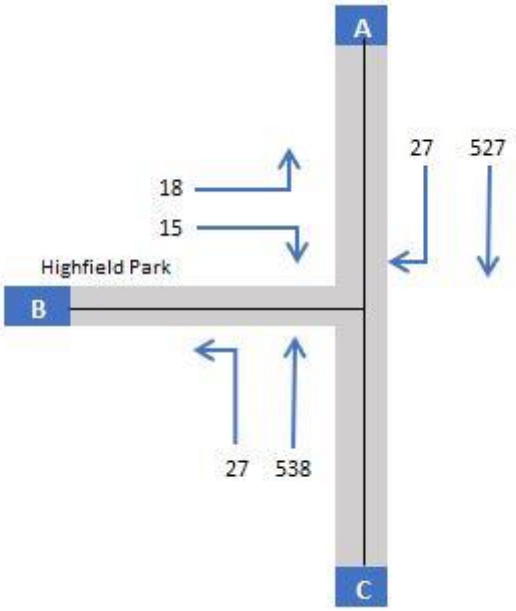


Figure 8.12: Picady Input for R117 – Highfield Park Junction PM Peak Hour – Scenario A

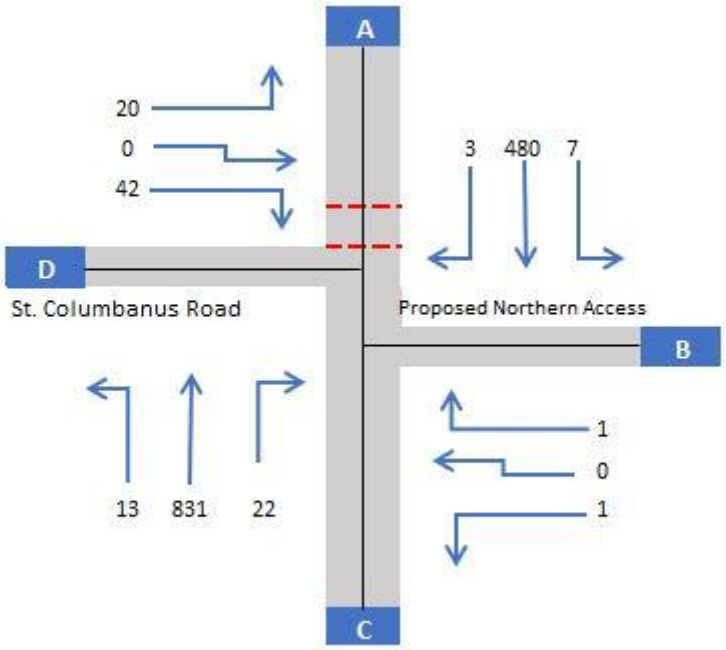


Figure 8.13: Picady Input for St. Columbanus Road/Northern Access Junction with Pedestrian Crossing included – AM Peak Hour – Scenario B

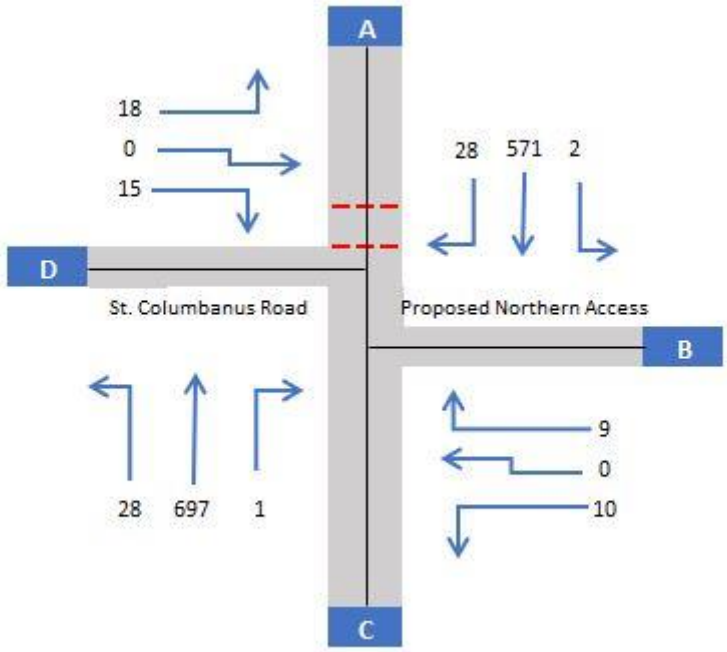


Figure 8.14: Picady Input for St. Columbanus Road/Northern Access Junction with Pedestrian Crossing included – PM Peak Hour – Scenario B

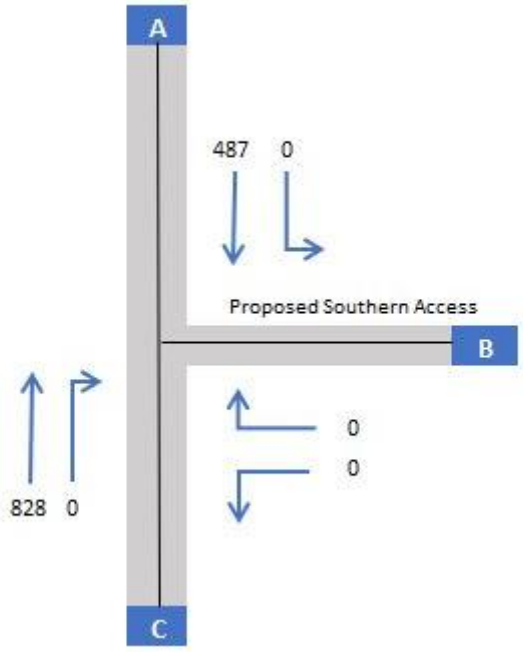


Figure 8.15: Picady Input for Proposed Southern Access Junction – AM Peak Hour – Scenario B

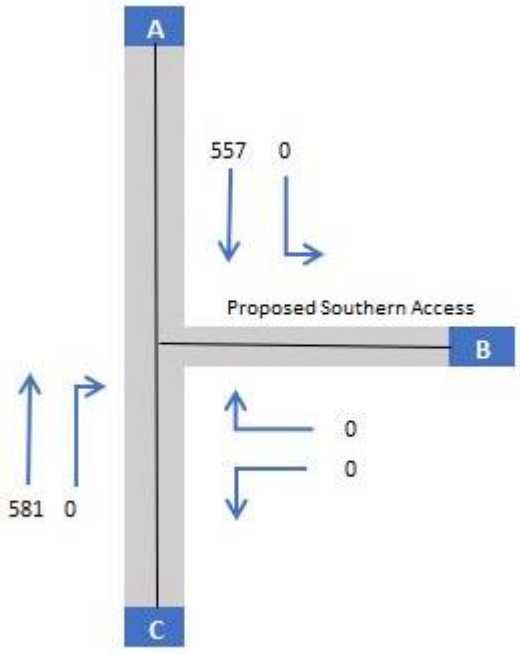


Figure 8.16: Picady Input for Proposed Southern Access Junction – PM Peak Hour – Scenario B

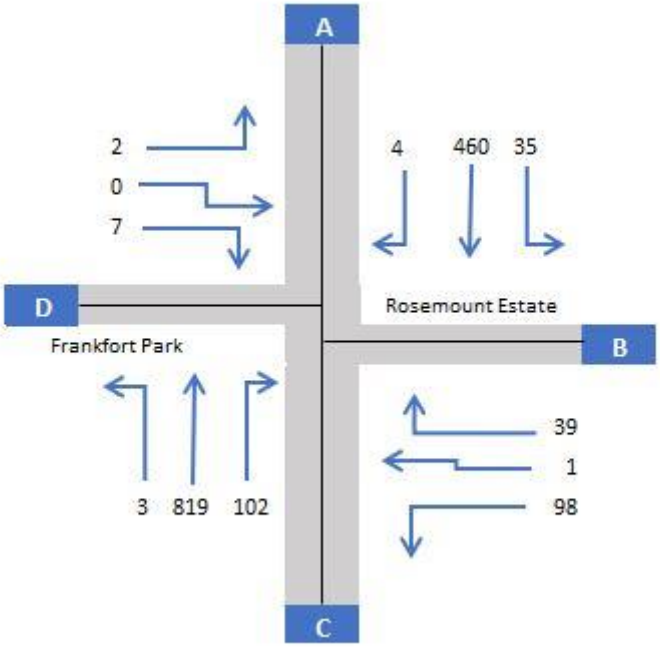


Figure 8.17: Picady Input for R117 – Frankfort Park - Rosemount Junction AM Peak Hour – Scenario B

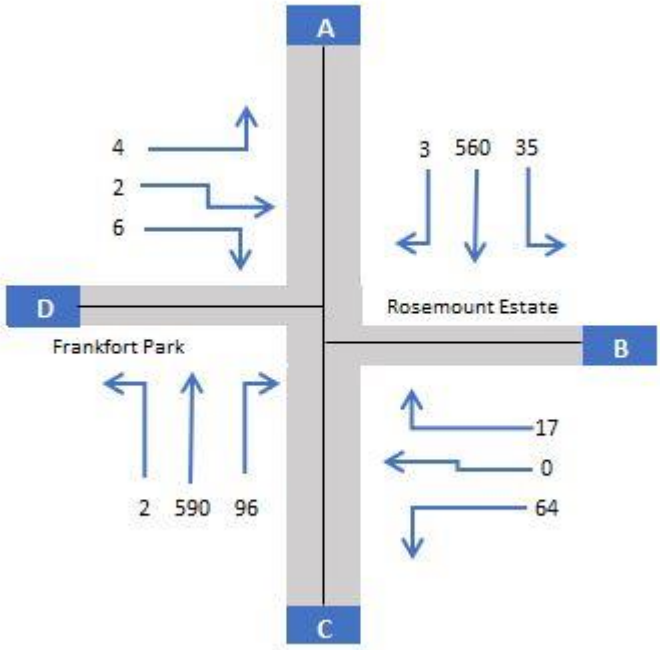


Figure 8.18: Picady Input for R117 – Frankfort Park - Rosemount Junction PM Peak Hour – Scenario B

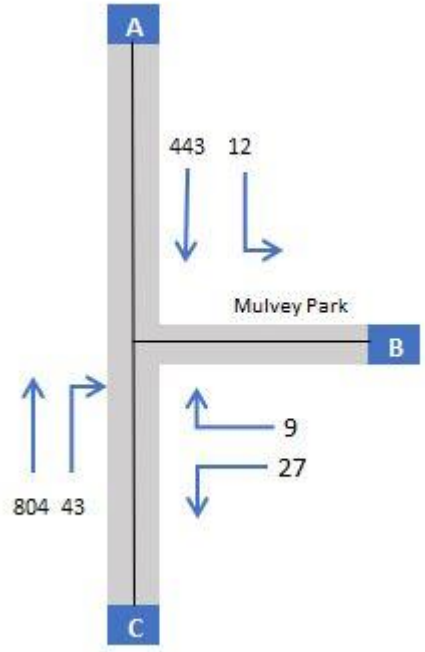


Figure 8.19: Picady Input for R117 – Mulvey Park Junction AM Peak Hour – Scenario B

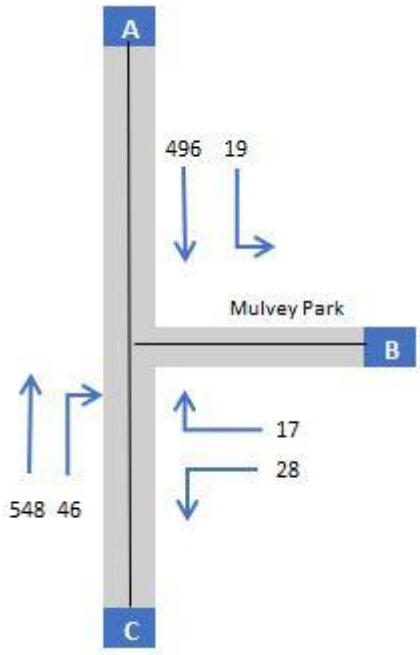


Figure 8.20: Picady Input for R117 – Mulvey Park Junction PM Peak Hour – Scenario B

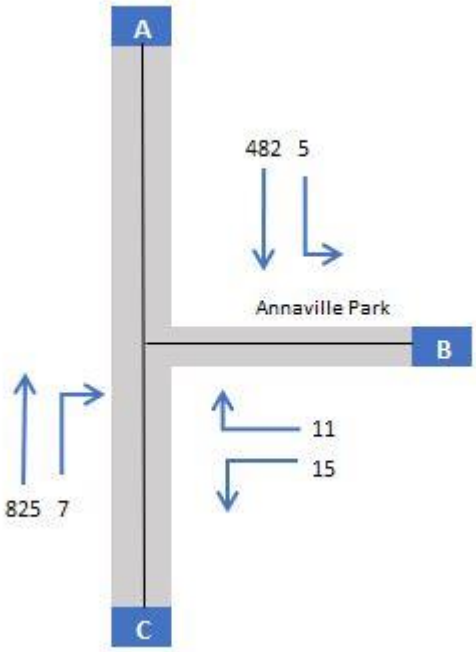


Figure 8.21: Picady Input for R117 – Annaville Park Junction AM Peak Hour – Scenario B

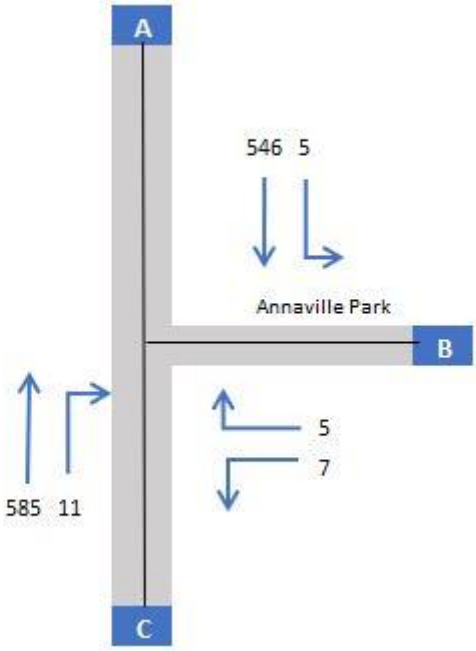


Figure 8.22: Picady Input for R117 – Annaville Park Junction PM Peak Hour – Scenario B

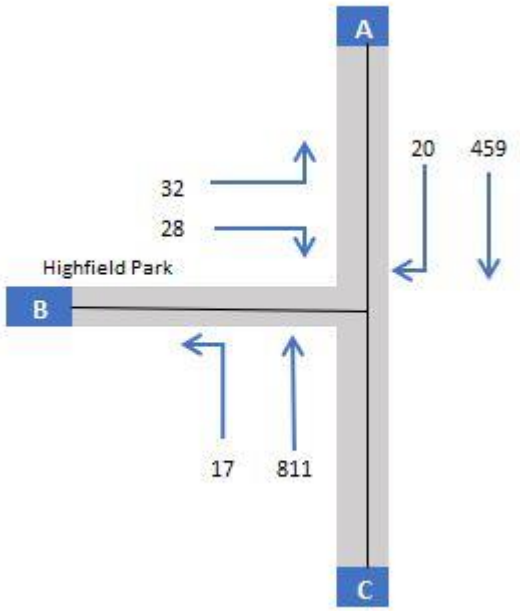


Figure 8.23: Picady Input for R117 – Highfield Park Junction AM Peak Hour – Scenario B

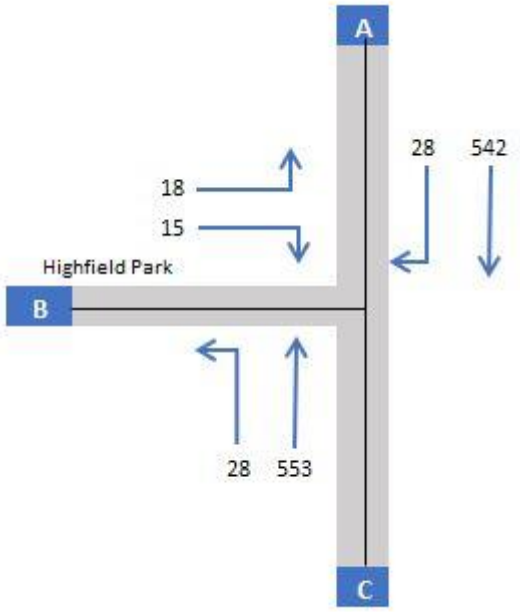


Figure 8.24: Picady Input for R117 – Highfield Park Junction PM Peak Hour – Scenario B

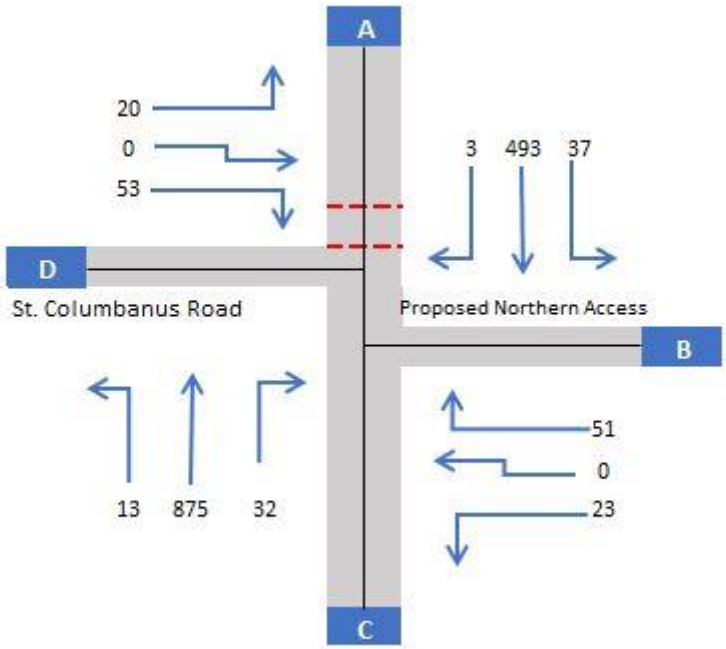


Figure 8.25: Picady Input for St. Columbanus Road/Northern Access Junction with Pedestrian Crossing included – AM Peak Hour - Scenario C - 2024 Opening Year with Cumulative Impact and with Proposed Development Traffic

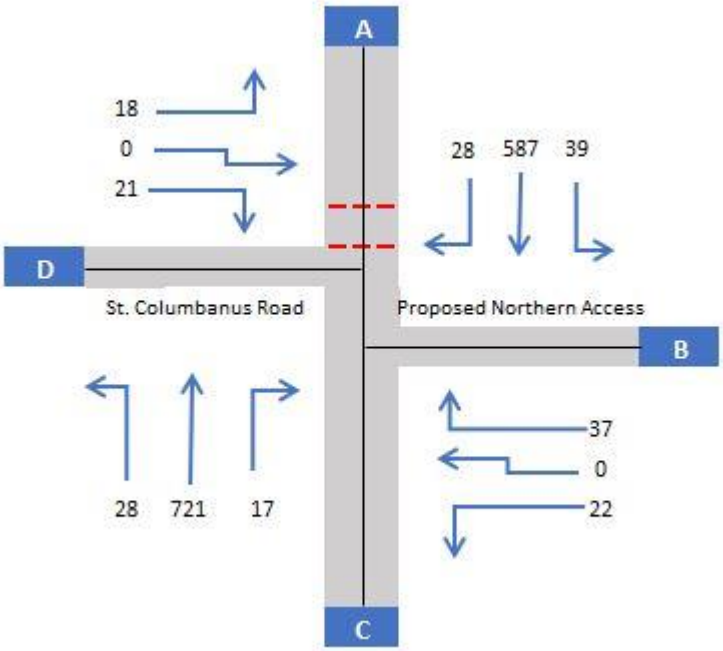


Figure 8.26: Picady Input for St. Columbanus Road/Northern Access Junction with Pedestrian Crossing included – PM Peak Hour - Scenario C - 2024 Opening Year with Cumulative Impact and with Proposed Development Traffic

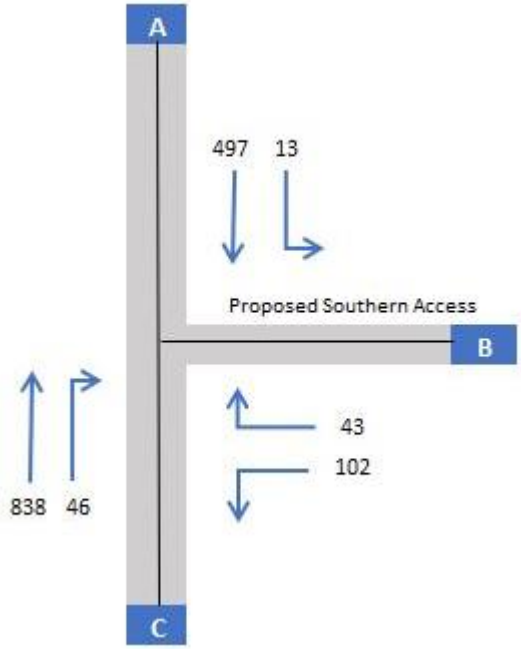


Figure 8.27: Picady Input for Proposed Southern Access Junction – AM Peak Hour - Scenario C - 2024 Opening Year with Cumulative Impact and with Proposed Development Traffic

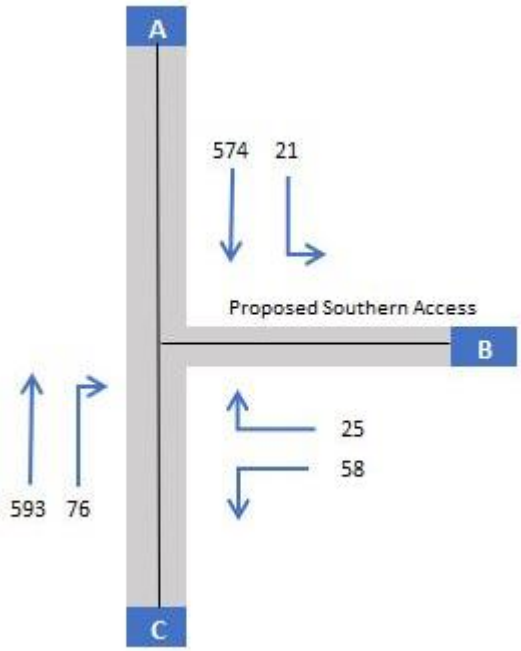


Figure 8.28: Picady Input for Proposed Southern Access Junction – PM Peak - Scenario C - 2024 Opening Year with Cumulative Impact and with Proposed Development Traffic

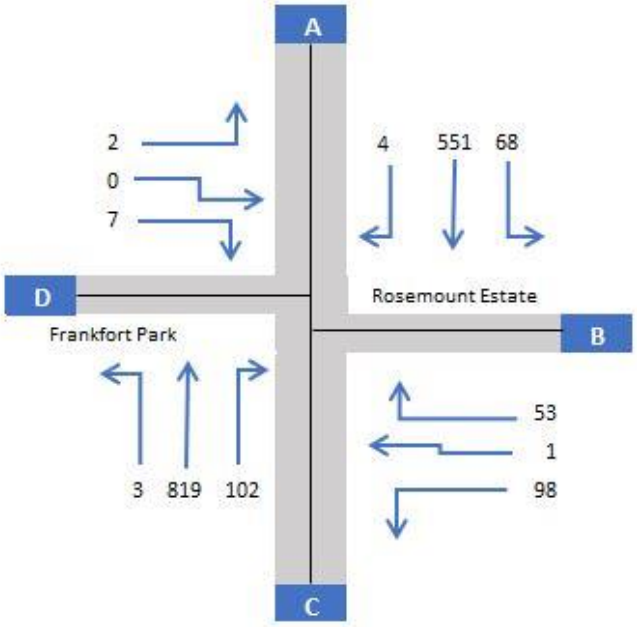


Figure 8.29: Picady Input for R117 – Frankfort Park - Rosemount Junction AM Peak Hour - Scenario C - 2024 Opening Year with Cumulative Impact and with Proposed Development Traffic

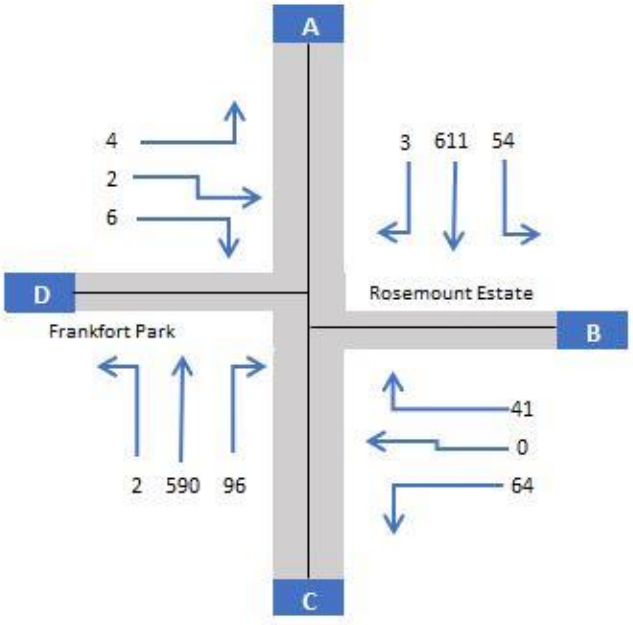


Figure 8.30: Picady Input for R117 – Frankfort Park - Rosemount Junction PM Peak Hour - Scenario C - 2024 Opening Year with Cumulative Impact and with Proposed Development Traffic

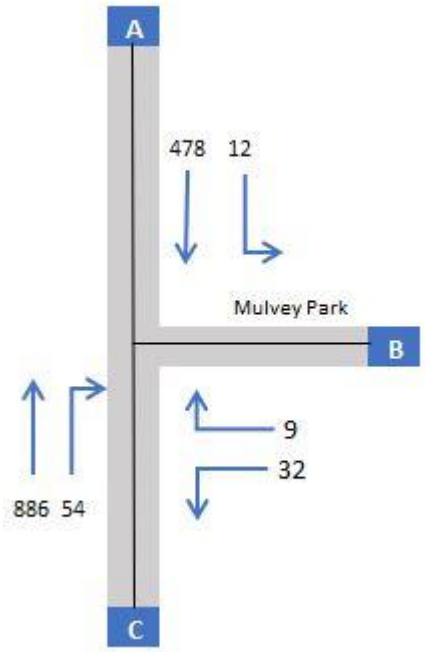


Figure 8.31: Picady Input for R117 – Mulvey Park Junction AM Peak Hour - Scenario C - 2024 Opening Year with Cumulative Impact and with Proposed Development Traffic

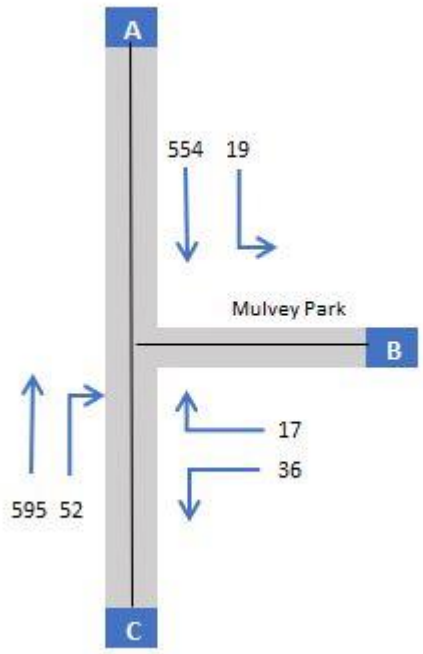


Figure 8.32: Picady Input for R117 – Mulvey Park Junction PM Peak Hour - Scenario C - 2024 Opening Year with Cumulative Impact and with Proposed Development Traffic

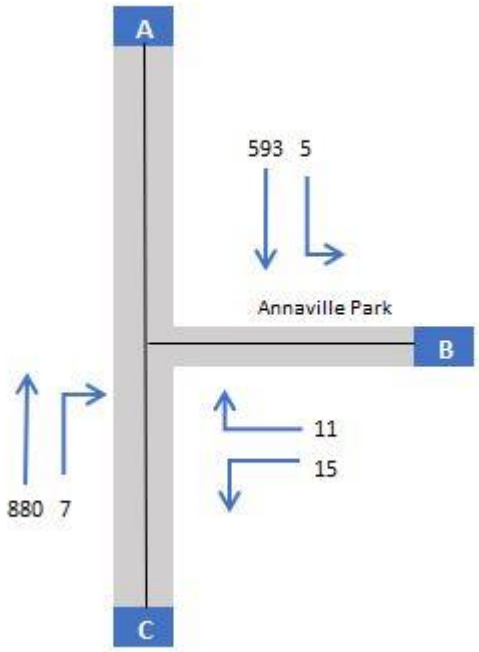


Figure 8.33: Picady Input for R117 – Annaville Park Junction AM Peak Hour - Scenario C - 2024 Opening Year with Cumulative Impact and with Proposed Development Traffic

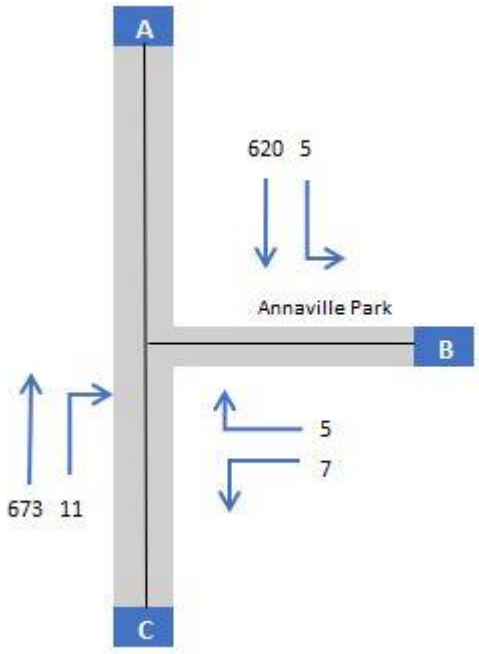


Figure 8.34: Picady Input for R117 – Annaville Park Junction PM Peak Hour - Scenario C - 2024 Opening Year with Cumulative Impact and with Proposed Development Traffic

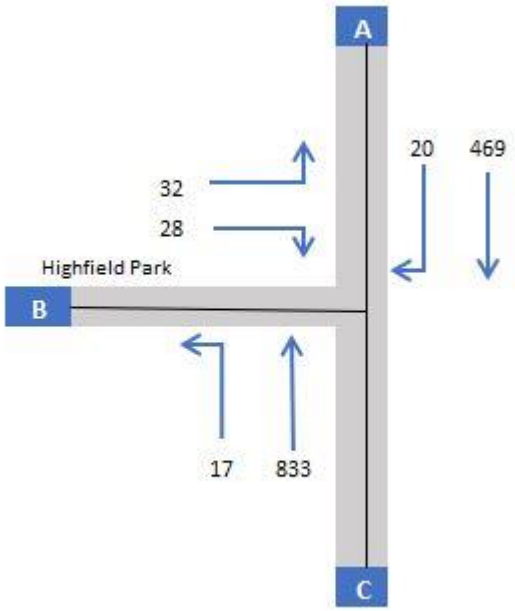


Figure 8.35: Picady Input for R117 – Highfield Park Junction AM Peak Hour - Scenario C - 2024 Opening Year with Cumulative Impact and with Proposed Development Traffic

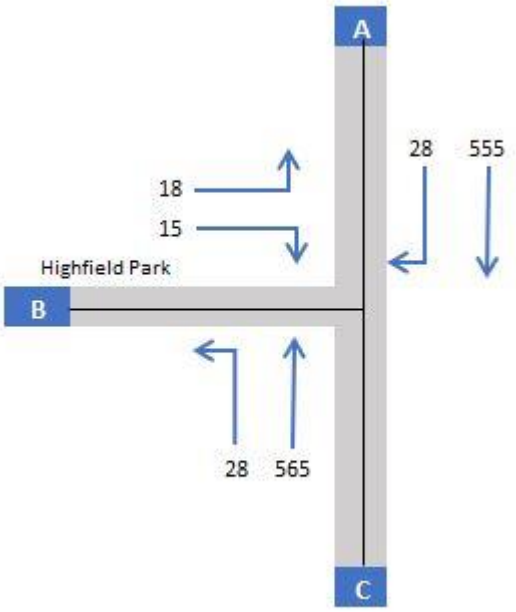


Figure 8.36: Picady Input for R117 – Highfield Park Junction PM Peak Hour - Scenario C - 2024 Opening Year with Cumulative Impact and with Proposed Development Traffic

8.3.7 The results of the PICADY Assessment for the Columbanus Road/Northern Access Junction are shown in Tables 8.3 to 8.8 and the results for the Proposed Southern Access Junction are shown in Tables 8.9 to 8.14.

Table 8.3: AM Peak Hour PICADY Analysis - St. Columbanus Road/Northern Access Junction – Scenario A

Segment	Stream	Demand	Capacity	RFC	Start Queue (veh)	End Queue (veh)	Delay	Mean Arriving Vehicle Delay (min)
08:00-09:00	B-C	0.01	7.80	0.002	0.000	0.00	0.00	0.13
	B-AD	0.01	3.78	0.004	0.000	0.00	0.10	0.27
	D-ABC	1.02	4.00	0.255	0.33	0.34	5.00	0.34
	C-A	13.46	-	-	-	-	-	-
	C-B	0.37	7.75	0.047	0.05	0.05	0.70	0.14
	C-D	0.20	-	-	-	-	-	-
	A-BC	7.90	22.73	0.348	1.04	1.05	15.70	0.07
	A-D	0.05	0.14	0.350	0.01	0.01	0.10	8.58

Table 8.4: AM Peak Hour PICADY Analysis - St. Columbanus Road/Northern Access Junction – Scenario B

Segment	Stream	Demand	Capacity	RFC	Start Queue (veh)	End Queue (veh)	Delay	Mean Arriving Vehicle Delay (min)
08:00-09:00	B-C	0.01	7.75	0.002	0	0	0.00	0.13
	B-AD	0.01	3.71	0.004	0	0	0.10	0.27
	D-ABC	1.03	3.92	0.263	0.350	0.35	5.30	0.35
	C-A	13.65	-	-	-	-	-	-
	C-B	0.36	7.71	0.047	0.05	0.05	0.70	0.14
	C-D	0.21	-	-	-	-	-	-
	A-BC	8.07	22.73	0.355	1.09	1.09	16.40	0.07
	A-D	0.05	0.14	0.357	0.01	0.01	0.10	8.61

Table 8.5: AM Peak Hour PICADY Analysis - St. Columbanus Road/Northern Access Junction – Scenario C

Segment	Stream	Demand	Capacity	RFC	Start Queue (veh)	End Queue (veh)	Delay	Mean Arriving Vehicle Delay (min)
17:00-18:00	B-C	0.15	7.50	0.020	0.020	0.02	0.30	0.14
	B-AD	0.13	3.94	0.033	0.030	0.03	0.50	0.26
	D-ABC	0.55	4.80	0.115	0.13	0.13	1.90	0.24
	C-A	11.28	-	-	-	-	-	-
	C-B	0.02	7.52	0.002	0	0	0.00	0.13
	C-D	0.45	-	-	-	-	-	-
	A-BC	9.28	20.83	0.446	1.51	1.52	22.80	0.09
	A-D	0.45	0.98	0.461	0.08	0.08	1.20	1.66

Table 8.6: PM Peak Hour PICADY Analysis - St. Columbanus Road/Northern Access Junction 2024 – Scenario A

Segment	Stream	Demand	Capacity	RFC	Start Queue (veh)	End Queue (veh)	Delay	Mean Arriving Vehicle Delay (min)
17:00-18:00	B-C	0.15	7.50	0.020	0.020	0.02	0.30	0.14
	B-AD	0.13	3.94	0.033	0.030	0.03	0.50	0.26
	D-ABC	0.55	4.80	0.115	0.13	0.13	1.90	0.24
	C-A	11.28	-	-	-	-	-	-
	C-B	0.02	7.52	0.002	0	0	0.00	0.13
	C-D	0.45	-	-	-	-	-	-
	A-BC	9.28	20.83	0.446	1.51	1.52	22.80	0.09
	A-D	0.45	0.98	0.461	0.08	0.08	1.20	1.66

Table 8.7: PM Peak Hour PICADY Analysis - St. Columbanus Road/Northern Access Junction 2024 – Scenario B

Segment	Stream	Demand	Capacity	RFC	Start Queue	End Queue	Delay	Mean Arriving Vehicle Delay (min)
17:00-18:00	B-C	0.17	7.42	0.023	0.02	0.02	0.30	0.14
	B-AD	0.15	3.83	0.040	0.04	0.04	0.60	0.27
	D-ABC	0.55	4.66	0.118	0.130	0.13	2.00	0.24
	C-A	11.62	-	-	-	-	-	-
	C-B	0.02	7.45	0.002	0	0	0.00	0.13
	C-D	0.47	-	-	-	-	-	-
	A-BC	9.55	20.78	0.460	1.59	1.61	24.10	0.09
	A-D	0.47	0.98	0.475	0.09	0.09	1.30	1.69

Table 8.8: PM Peak Hour PICADY Analysis - St. Columbanus Road/Northern Access Junction 2024 – Scenario C

Segment	Stream	Demand	Capacity	RFC	Start Queue	End Queue	Delay	Mean Arriving Vehicle Delay (min)
17:00-18:00	B-C	0.37	7.02	0.052	0.05	0.05	0.80	0.15
	B-AD	0.61	3.54	0.174	0.2	0.21	3.10	0.34
	D-ABC	0.65	4.04	0.161	0.19	0.19	2.80	0.30
	C-A	12.02	-	-	-	-	-	-
	C-B	0.28	7.21	0.039	0.04	0.04	0.60	0.14
	C-D	0.47	-	-	-	-	-	-
	A-BC	10.43	20.88	0.500	1.87	1.89	28.30	0.10
	A-D	0.47	0.91	0.512	0.09	0.09	1.40	1.89

8.3.8 The Picady results for the proposed northern access junction show that the approach arms of the proposed junction will operate at or below 52% capacity with the projected peak hour development traffic in place. This confirms the proposed access has more than adequate capacity for the proposed development.

Table 8.9: AM Peak Hour PICADY Analysis – Proposed Southern Access Junction – Scenario A

Segment	Stream	Demand	Capacity	RFC	Start Queue	End Queue	Delay	Mean Arriving Vehicle Delay (min)
08:00-09:00	B-A	0.00	4.28	0.000	0.00	0.00	0.00	0.00
	B-C	0.00	8.13	0.000	0.00	0.00	0.00	0.00
	C-AB	0.00	7.94	0.000	0.00	0.00	0.00	0.00
	C-A	13.42	-	-	-	-	-	-
	A-B	0.00	-	-	-	-	-	-
	A-C	7.88	-	-	-	-	-	-

Table 8.10: AM Peak Hour PICADY Analysis – Proposed Southern Access Junction – Scenario B

Segment	Stream	Demand	Capacity	RFC	Start Queue	End Queue	Delay	Mean Arriving Vehicle Delay (min)
08:00-09:00	B-A	0.00	4.17	0.000	0.00	0.00	0.00	0.00
	B-C	0.00	8.07	0.000	0.00	0.00	0.00	0.00
	C-AB	0.00	7.88	0.000	0.00	0.00	0.00	0.00
	C-A	13.80	-	-	-	-	-	-
	A-B	0.00	-	-	-	-	-	-
	A-C	8.12	-	-	-	-	-	-

Table 8.11: AM Peak Hour PICADY Analysis – Proposed Southern Access Junction – Scenario C

Segment	Stream	Demand	Capacity	RFC	Start Queue	End Queue	Delay	Mean Arriving Vehicle Delay (min)
08:00-09:00	B-A	0.72	3.82	0.188	0.22	0.23	3.40	0.32
	B-C	1.70	7.63	0.223	0.28	0.29	4.30	0.17
	C-AB	3.46	17.61	0.196	0.65	0.67	10.10	0.07
	C-A	11.27	-	-	-	-	-	-
	A-B	0.22	-	-	-	-	-	-
	A-C	8.28	-	-	-	-	-	-

Table 8.12: PM Peak Hour PICADY Analysis – Proposed Southern Access Junction – Scenario A

Segment	Stream	Demand	Capacity	RFC	Start Queue	End Queue	Delay	Mean Arriving Vehicle Delay (min)
17:00-18:00	B-A	0.00	4.61	0.000	0.00	0.00	0.00	0.00
	B-C	0.00	7.85	0.000	0.00	0.00	0.00	0.00
	C-AB	0.00	7.66	0.000	0.00	0.00	0.00	0.00
	C-A	9.42	-	-	-	-	-	-
	A-B	0.00	-	-	-	-	-	-
	A-C	9.03	-	-	-	-	-	-

Table 8.13: PM Peak Hour PICADY Analysis – Proposed Southern Access Junction – Scenario B

Segment	Stream	Demand	Capacity	RFC	Start Queue	End Queue	Delay	Mean Arriving Vehicle Delay (min)
17:00-18:00	B-A	0.00	4.51	0.000	0.00	0.00	0.00	0.00
	B-C	0.00	7.79	0.000	0.00	0.00	0.00	0.00
	C-AB	0.00	7.60	0.000	0.00	0.00	0.00	0.00
	C-A	9.68	-	-	-	-	-	-
	A-B	0.00	-	-	-	-	-	-
	A-C	9.28	-	-	-	-	-	-

Table 8.14: PM Peak Hour PICADY Analysis – Proposed Southern Access Junction – Scenario C

Segment	Stream	Demand	Capacity	RFC	Start Queue	End Queue	Delay	Mean Arriving Vehicle Delay (min)
17:00-18:00	B-A	0.42	3.94	0.106	0.12	0.12	1.70	0.28
	B-C	0.96	7.47	0.129	0.15	0.15	2.20	0.15
	C-AB	3.85	14.58	0.264	0.78	0.79	12.10	0.09
	C-A	7.30	-	-	-	-	-	-
	A-B	0.35	-	-	-	-	-	-
	A-C	9.57	-	-	-	-	-	-

8.3.9 The Picady results for the proposed southern access junction show that the approach arms of the proposed junction will operate at or below 27% capacity with the projected peak hour development traffic in place. This confirms the proposed access has more than adequate capacity for the proposed development.

8.3.10 The full Picady model input and output records are included in **Appendix A**.

8.4 Capacity Assessments of Adjoining Junctions - Overview

8.4.1 As set out above, ILTP have conducted capacity assessments of adjoining junctions in the vicinity of the proposed development access, which are as follows:

- R117 – Frankfort Park – Rosemount Junction
- R117 – Mulvey Park Junction
- R117 – Annaville Park Junction
- R177 – Highfield Junction

8.5 Capacity Assessment of R117 – Frankfort Park - Rosemount Junction

8.5.1 ILTP performed a PICADY capacity assessment of R117- Frankfort Park - Rosemount junction for **Scenario A** (2021 Base Year), **Scenario B** (2024 Opening Year with Cumulative Impact of Other Permitted Developments) and **Scenario C** (2024 Opening Year with Cumulative Impact and with Proposed Development Traffic).

8.5.2 The results of the PICADY Assessment are shown in Tables 8.15 to 8.20.

Table 8.15: AM Peak Hour PICADY Analysis - R117 – Frankfort Park - Rosemount Junction – Scenario A

Segment	Stream	Demand	Capacity	RFC	Start Queue	End Queue	Delay	Mean Arriving Vehicle Delay (min)
08:00-09:00	B-ACD	2.23	5.57	0.401	0.00	0.65	8.90	0.29
	D-ABC	0.15	3.97	0.038	0.00	0.04	0.50	0.26
	C-ABD	7.13	17.18	0.415	0.00	1.63	23.70	0.10
	C-A	7.81	-	-	-	-	-	-
	C-D	0.03	-	-	-	-	-	-
	A-BCD	0.17	12.08	0.014	0.00	0.02	0.20	0.08
	A-B	0.56	-	-	-	-	-	-
	A-C	7.36	-	-	-	-	-	-

Table 8.16: AM Peak Hour PICADY Analysis - R117 – Frankfort Park - Rosemount Junction – Scenario B

Segment	Stream	Demand	Capacity	RFC	Start Queue	End Queue	Delay	Mean Arriving Vehicle Delay (min)
08:00-09:00	B-ACD	2.30	5.41	0.425	0.71	0.73	10.80	0.32
	D-ABC	0.15	3.81	0.039	0.04	0.04	0.60	0.27
	C-ABD	7.82	17.47	0.447	1.83	1.89	28.80	0.10
	C-A	7.56	-	-	-	-	-	-
	C-D	0.03	-	-	-	-	-	-
	A-BCD	0.17	12.15	0.014	0.02	0.02	0.20	0.08
	A-B	0.58	-	-	-	-	-	-
	A-C	7.57	-	-	-	-	-	-

Table 8.17: AM Peak Hour PICADY Analysis - R117 – Frankfort Park - Rosemount Junction – Scenario C

Segment	Stream	Demand	Capacity	RFC	Start Queue	End Queue	Delay	Mean Arriving Vehicle Delay (min)
08:00-09:00	B-ACD	2.53	4.65	0.544	1.11	1.15	17.00	0.47
	D-ABC	0.15	3.45	0.043	0.04	0.04	0.70	0.30
	C-ABD	8.25	17.25	0.478	2.11	2.19	33.60	0.11
	C-A	7.13	-	-	-	-	-	-
	C-D	0.03	-	-	-	-	-	-
	A-BCD	0.20	13.37	0.015	0.02	0.02	0.30	0.08
	A-B	1.12	-	-	-	-	-	-
	A-C	9.06	-	-	-	-	-	-

Table 8.18: PM Peak Hour PICADY Analysis - R117 – Frankfort Park - Rosemount Junction – Scenario A

Segment	Stream	Demand	Capacity	RFC	Start Queue	End Queue	Delay	Mean Arriving Vehicle Delay (min)
17:00-18:00	B-ACD	1.32	5.85	0.226	0.29	0.29	4.30	0.22
	D-ABC	0.20	5.00	0.040	0.04	0.04	0.60	0.21
	C-ABD	4.70	14.27	0.329	1.01	1.03	15.70	0.11
	C-A	6.43	-	-	-	-	-	-
	C-D	0.02	-	-	-	-	-	-
	A-BCD	0.13	13.73	0.009	0.01	0.01	0.20	0.07
	A-B	0.56	-	-	-	-	-	-
	A-C	8.99	-	-	-	-	-	-

Table 8.19: PM Peak Hour PICADY Analysis - R117 – Frankfort Park - Rosemount Junction – Scenario B

Segment	Stream	Demand	Capacity	RFC	Start Queue	End Queue	Delay	Mean Arriving Vehicle Delay (min)
17:00-18:00	B-ACD	1.35	5.78	0.234	0.30	0.30	4.50	0.23
	D-ABC	0.20	4.88	0.041	0.04	0.04	0.60	0.21
	C-ABD	5.05	14.48	0.348	1.11	1.13	17.20	0.11
	C-A	6.40	-	-	-	-	-	-
	C-D	0.02	-	-	-	-	-	-
	A-BCD	0.13	13.84	0.010	0.01	0.01	0.20	0.07
	A-B	0.58	-	-	-	-	-	-
	A-C	9.26	-	-	-	-	-	-

Table 8.20: PM Peak Hour PICADY Analysis - R117 – Frankfort Park - Rosemount Junction – Scenario C

Segment	Stream	Demand	Capacity	RFC	Start Queue	End Queue	Delay	Mean Arriving Vehicle Delay (min)
17:00-18:00	B-ACD	1.75	4.77	0.367	0.56	0.57	8.50	0.33
	D-ABC	0.20	4.62	0.043	0.04	0.04	0.70	0.23
	C-ABD	5.19	14.31	0.362	1.19	1.22	18.60	0.11
	C-A	6.26	-	-	-	-	-	-
	C-D	0.02	-	-	-	-	-	-
	A-BCD	0.14	14.43	0.010	0.01	0.01	0.20	0.07
	A-B	0.89	-	-	-	-	-	-
	A-C	10.09	-	-	-	-	-	-

8.5.3 The Picady results for the R117 – Frankfort Park - Rosemount junction show that the approach arms of the junction will operate at or below 54% capacity with the projected peak hour development traffic in place. This confirms the junction has adequate capacity for the proposed development.

8.6 Capacity Assessment of R117 – Mulvey Park Junction

8.6.1 ILTP performed a PICADY capacity assessment of R117 - Mulvey Park junction for **Scenario A** (2021 Base Year), **Scenario B** (2024 Opening Year with Cumulative Impact of Other Permitted Developments) and **Scenario C** (2024 Opening Year with Cumulative Impact and with Proposed Development Traffic).

8.6.2 The results of the PICADY Assessment are shown in Tables 8.21 and 8.26.

Table 8.21: AM Peak Hour PICADY Analysis - R117 – Mulvey Park Junction – Scenario A

Segment	Stream	Demand	Capacity	RFC	Start Queue	End Queue	Delay	Mean Arriving Vehicle Delay (min)
08:00-09:00	B-AC	0.57	7.11	0.080	0.09	0.09	1.30	0.15
	C-AB	2.70	16.99	0.159	0.44	0.45	6.90	0.07
	C-A	11.02	-	-	-	-	-	-
	A-B	0.18	-	-	-	-	-	-
	A-C	7.19	-	-	-	-	-	-

Table 8.22: AM Peak Hour PICADY Analysis - R117 – Mulvey Park Junction – Scenario B

Segment	Stream	Demand	Capacity	RFC	Start Queue	End Queue	Delay	Mean Arriving Vehicle Delay (min)
08:00-09:00	B-AC	0.60	6.93	0.087	0.09	0.09	1.40	0.16
	C-AB	2.99	17.36	0.172	0.51	0.52	8.00	0.07
	C-A	11.13	-	-	-	-	-	-
	A-B	0.20	-	-	-	-	-	-
	A-C	7.38	-	-	-	-	-	-

Table 8.23: AM Peak Hour PICADY Analysis - R117 – Mulvey Park Junction – Scenario C

Segment	Stream	Demand	Capacity	RFC	Start Queue	End Queue	Delay	Mean Arriving Vehicle Delay (min)
08:00-09:00	B-AC	0.68	6.76	0.101	0.11	0.11	1.70	0.16
	C-AB	4.50	18.29	0.246	0.87	0.91	13.90	0.07
	C-A	11.17	-	-	-	-	-	-
	A-B	0.20	-	-	-	-	-	-
	A-C	7.97	-	-	-	-	-	-

Table 8.24: PM Peak Hour PICADY Analysis - R117 – Mulvey Park Junction – Scenario A

Segment	Stream	Demand	Capacity	RFC	Start Queue	End Queue	Delay	Mean Arriving Vehicle Delay (min)
17:00-18:00	B-AC	0.73	6.58	0.111	0.12	0.12	1.90	0.17
	C-AB	2.00	14.11	0.142	0.36	0.37	5.60	0.08
	C-A	7.62	-	-	-	-	-	-
	A-B	0.32	-	-	-	-	-	-
	A-C	8.05	-	-	-	-	-	-

Table 8.25: PM Peak Hour PICADY Analysis - R117 – Mulvey Park Junction – Scenario B

Segment	Stream	Demand	Capacity	RFC	Start Queue	End Queue	Delay	Mean Arriving Vehicle Delay (min)
17:00-18:00	B-AC	0.75	6.52	0.115	0.13	0.13	1.90	0.17
	C-AB	2.10	14.26	0.148	0.39	0.40	6.00	0.08
	C-A	7.80	-	-	-	-	-	-
	A-B	0.32	-	-	-	-	-	-
	A-C	8.26	-	-	-	-	-	-

Table 8.26: PM Peak Hour PICADY Analysis - R117 – Mulvey Park Junction – Scenario C

Segment	Stream	Demand	Capacity	RFC	Start Queue	End Queue	Delay	Mean Arriving Vehicle Delay (min)
17:00-18:00	B-AC	0.88	6.38	0.138	0.16	0.16	2.40	0.18
	C-AB	2.62	14.65	0.179	0.52	0.53	8.00	0.08
	C-A	8.16	-	-	-	-	-	-
	A-B	0.32	-	-	-	-	-	-
	A-C	9.23	-	-	-	-	-	-

8.6.3 The Picady results for the R117 – Mulvey Park junction show that the approach arms of the junction will operate at or below 18% capacity with the projected peak hour development traffic in place. This confirms the junction has more than adequate capacity for the proposed development.

8.7 Capacity Assessment of R117 – Annaville Park Junction

8.7.1 ILTP performed a PICADY capacity assessment of R117- Annaville junction for **Scenario A** (2021 Base Year), **Scenario B** (2024 Opening Year with Cumulative Impact of Other Permitted Developments) and **Scenario C** (2024 Opening Year with Cumulative Impact and with Proposed Development Traffic).

8.7.2 The results of the PICADY Assessment are shown in Tables 8.27 and 8.32.

Table 8.27: AM Peak Hour PICADY Analysis - R117 –Annaville Junction – Scenario A

Segment	Stream	Demand	Capacity	RFC	Start Queue	End Queue	Delay	Mean Arriving Vehicle Delay (min)
08:00-09:00	B-AC	0.42	6.31	0.067	0.07	0.07	1.10	0.17
	C-A	14.16	-	-	-	-	-	-
	C-B	0.12	7.43	0.016	0.02	0.02	0.20	0.14
	A-B	0.08	-	-	-	-	-	-
	A-C	7.80	-	-	-	-	-	-

Table 8.28: AM Peak Hour PICADY Analysis - R117 –Annaville Junction – Scenario B

Segment	Stream	Demand	Capacity	RFC	Start Queue	End Queue	Delay	Mean Arriving Vehicle Delay (min)
08:00-09:00	B-AC	0.43	6.18	0.070	0.07	0.07	1.10	0.17
	C-A	13.75	-	-	-	-	-	-
	C-B	0.12	7.38	0.016	0.02	0.02	0.20	0.14
	A-B	0.08	-	-	-	-	-	-
	A-C	8.04	-	-	-	-	-	-

Table 8.29: AM Peak Hour PICADY Analysis - R117 –Annaville Junction – Scenario C

Segment	Stream	Demand	Capacity	RFC	Start Queue	End Queue	Delay	Mean Arriving Vehicle Delay (min)
08:00-09:00	B-AC	0.43	5.45	0.079	0.08	0.08	1.30	0.20
	C-A	14.66	-	-	-	-	-	-
	C-B	0.12	6.94	0.017	0.02	0.02	0.30	0.15
	A-B	0.08	-	-	-	-	-	-
	A-C	9.89	-	-	-	-	-	-

Table 8.30: PM Peak Hour PICADY Analysis - R117 –Annaville Junction – Scenario A

Segment	Stream	Demand	Capacity	RFC	Start Queue	End Queue	Delay	Mean Arriving Vehicle Delay (min)
17:00-18:00	B-AC	0.20	6.54	0.031	0.03	0.03	0.50	0.16
	C-A	9.48	-	-	-	-	-	-
	C-B	0.17	7.19	0.023	0.02	0.02	0.40	0.14
	A-B	0.08	-	-	-	-	-	-
	A-C	8.84	-	-	-	-	-	-

Table 8.31: PM Peak Hour PICADY Analysis - R117 –Annaville Junction – Scenario B

Segment	Stream	Demand	Capacity	RFC	Start Queue	End Queue	Delay	Mean Arriving Vehicle Delay (min)
17:00-18:00	B-AC	0.20	6.42	0.031	0.03	0.03	0.50	0.16
	C-A	9.75	-	-	-	-	-	-
	C-B	0.18	7.12	0.026	0.03	0.03	0.40	0.14
	A-B	0.08	-	-	-	-	-	-
	A-C	9.10	-	-	-	-	-	-

Table 8.32: PM Peak Hour PICADY Analysis - R117 –Annaville Junction – Scenario C

Segment	Stream	Demand	Capacity	RFC	Start Queue	End Queue	Delay	Mean Arriving Vehicle Delay (min)
17:00-18:00	B-AC	0.20	5.84	0.034	0.04	0.04	0.50	0.18
	C-A	11.22	-	-	-	-	-	-
	C-B	0.18	6.83	0.027	0.03	0.03	0.40	0.15
	A-B	0.08	-	-	-	-	-	-
	A-C	10.34	-	-	-	-	-	-

8.7.3 The Picady results for the R117 – Annaville Park junction show that the approach arms of the junction will operate at or below 8% capacity with the projected peak hour development traffic in place. This confirms the junction has more than adequate capacity for the proposed development.

8.8 Capacity Assessment of R117 – Highfield Junction

8.8.1 ILTP performed a PICADY capacity assessment of R117- Highfield junction for **Scenario A** (2021 Base Year), **Scenario B** (2024 Opening Year with Cumulative Impact of Other Permitted Developments) and **Scenario C** (2024 Opening Year with Cumulative Impact and with Proposed Development Traffic).

8.8.2 The results of the PICADY Assessment are shown in Tables 8.33 and 8.38.

Table 8.33: AM Peak Hour PICADY Analysis - R117 –Highfield Junction – Scenario A

Segment	Stream	Demand	Capacity	RFC	Start Queue	End Queue	Delay	Mean Arriving Vehicle Delay (min)
08:00-09:00	B-AC	0.97	4.77	0.203	0.25	0.25	3.8	0.26
	C-AB	1.02	16.70	0.061	0.1	0.1	1.5	0.06
	C-A	12.40	-	-	-	-	-	-
	A-B	0.33	-	-	-	-	-	-
	A-C	7.44	-	-	-	-	-	-

Table 8.34: AM Peak Hour PICADY Analysis - R117 –Highfield Junction – Scenario B

Segment	Stream	Demand	Capacity	RFC	Start Queue	End Queue	Delay	Mean Arriving Vehicle Delay (min)
08:00-09:00	B-AC	1.00	4.69	0.213	0.27	0.27	4	0.27
	C-AB	1.06	16.89	0.063	0.1	0.1	1.6	0.06
	C-A	12.74	-	-	-	-	-	-
	A-B	0.33	-	-	-	-	-	-
	A-C	7.65	-	-	-	-	-	-

Table 8.35: AM Peak Hour PICADY Analysis - R117 –Highfield Junction – Scenario C

Segment	Stream	Demand	Capacity	RFC	Start Queue	End Queue	Delay	Mean Arriving Vehicle Delay (min)
08:00-09:00	B-AC	1.00	4.60	0.217	0.27	0.27	4.1	0.28
	C-AB	1.09	17.07	0.064	0.11	0.11	1.6	0.06
	C-A	13.08	-	-	-	-	-	-
	A-B	0.33	-	-	-	-	-	-
	A-C	7.82	-	-	-	-	-	-

Table 8.36: PM Peak Hour PICADY Analysis - R117 –Highfield Junction – Scenario A

Segment	Stream	Demand	Capacity	RFC	Start Queue	End Queue	Delay	Mean Arriving Vehicle Delay (min)
17:00-18:00	B-AC	0.55	4.85	0.113	0.13	0.13	1.9	0.23
	C-AB	1.19	13.93	0.085	0.16	0.16	2.5	0.08
	C-A	8.23	-	-	-	-	-	-
	A-B	0.45	-	-	-	-	-	-
	A-C	8.78	-	-	-	-	-	-

Table 8.37: PM Peak Hour PICADY Analysis - R117 –Highfield Junction – Scenario B

Segment	Stream	Demand	Capacity	RFC	Start Queue	End Queue	Delay	Mean Arriving Vehicle Delay (min)
17:00-18:00	B-AC	0.55	4.77	0.115	0.13	0.13	1.9	0.24
	C-AB	1.27	14.05	0.090	0.18	0.18	2.7	0.08
	C-A	8.41	-	-	-	-	-	-
	A-B	0.47	-	-	-	-	-	-
	A-C	9.03	-	-	-	-	-	-

Table 8.38: PM Peak Hour PICADY Analysis - R117 –Highfield Junction – Scenario C

Segment	Stream	Demand	Capacity	RFC	Start Queue	End Queue	Delay	Mean Arriving Vehicle Delay (min)
17:00-18:00	B-AC	0.55	4.70	0.117	0.13	0.13	2	0.24
	C-AB	1.30	14.14	0.092	0.18	0.18	2.8	0.08
	C-A	8.58	-	-	-	-	-	-
	A-B	0.47	-	-	-	-	-	-
	A-C	9.25	-	-	-	-	-	-

8.8.3 The Picady results for the R117 – Highfield junction show that the approach arms of the junction will operate at or below 9% capacity with the projected peak hour development traffic in place. This confirms the junction has more than adequate capacity for the proposed development.

8.9 LINSIG Signalised Junction Analysis – Existing Bird Avenue / R117 Junction

8.9.1 A LINSIG Traffic Modelling software analysis was conducted to assess the capacity of the existing Bird Avenue / R117 Junction.

8.9.2 The LinSig Model is based on the 1-hour time periods for the morning and evening peak traffic hours and presents an optimised solution for the network. The ILTP LinSig model for the Bird Avenue / R117 Junction is shown in Figure 8.37.

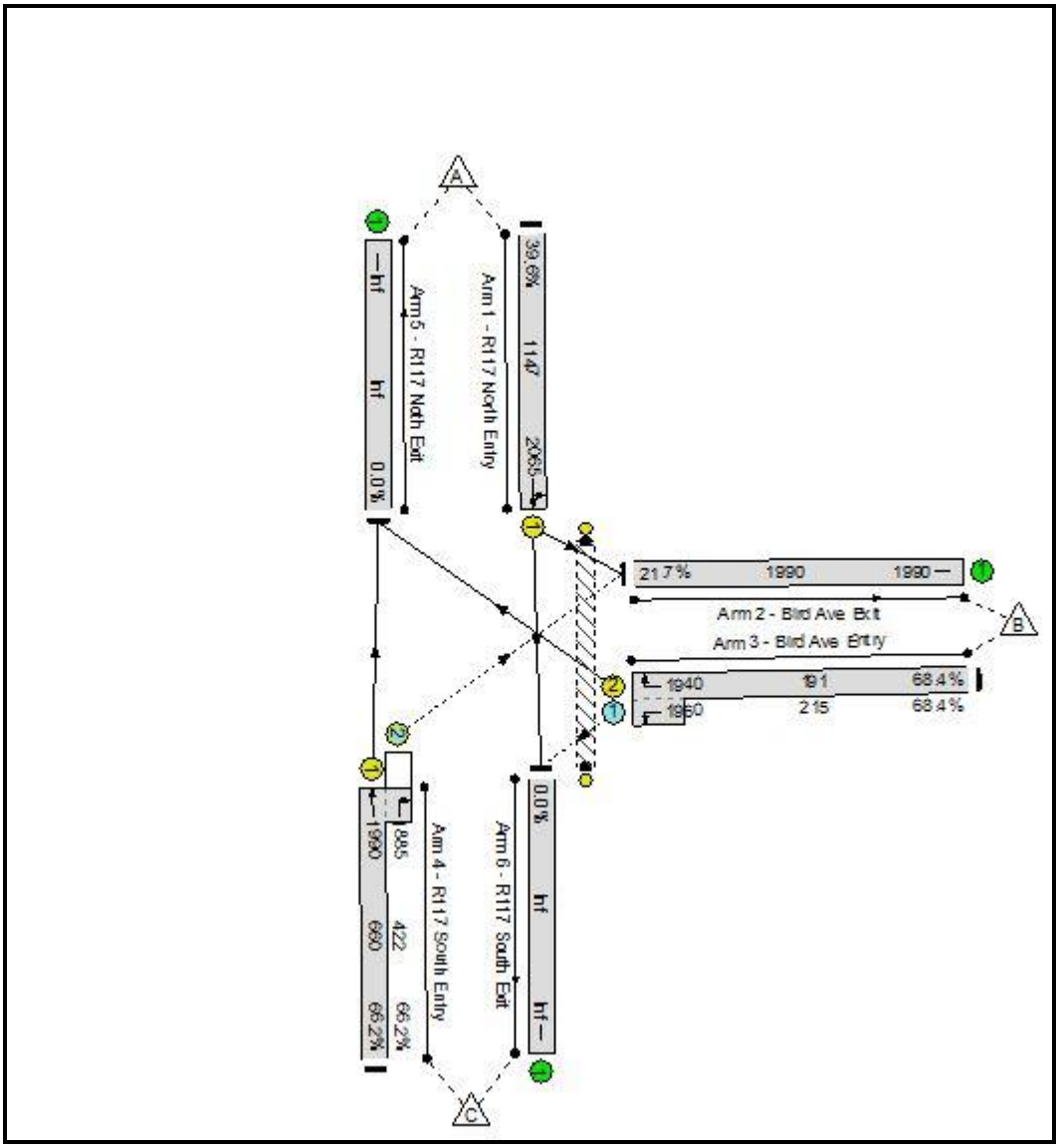


Figure 8.37: LinSig model of Bird Avenue / R117 Junction

8.9.3 The Opening year traffic volume inputs into LinSig with the development in place are shown in Figures 8.38 and 8.39. These include the AM and PM periods with the proposed development in place and fully occupied.

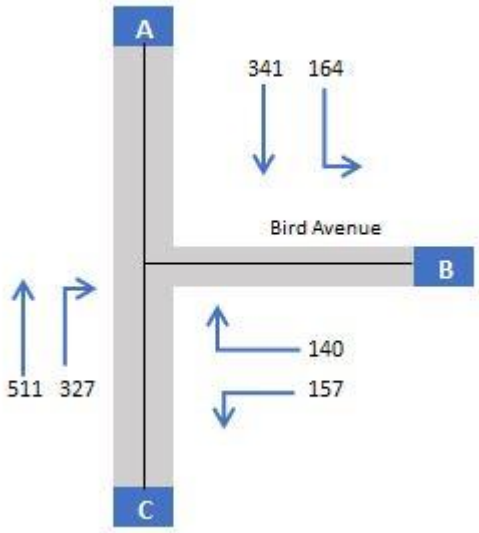


Figure 8.38: LinSig Input for R117 – Bird Avenue Junction AM Peak Hour 2024 with Dev

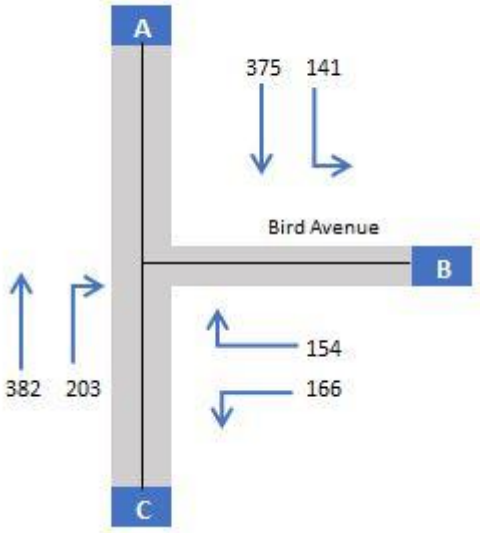


Figure 8.39: LinSig Input for R117 – Bird Avenue Junction PM Peak Hour 2024 with Dev

8.9.4 The results of the various scenarios modelled in LinSig are presented in Table 8.23 in terms of Degree of Saturation, which for an urban signalised junction should be below 90%. Values over 90% are typically regarded as experiencing occasional traffic congestion, with queues of vehicles beginning to form. It should be noted that at many urban junctions the Degree of Saturation exceeds 100% for a portion of the peak period.

8.9.5 The extent and duration of the queues which form as a result are managed, to minimise interference spreading through the network. To this end, the control of multiple signalised junctions by specialist controller software such as SCATS is used. The existing Bird Avenue / R117 junction modelled is operated by Dublin City Council (DCC), on behalf of DLRCC, using this SCATS system setting. Traffic signals are often set in favour of main roads, with side roads given minimum green time, which is in effect in the current junction arrangement.

Table 8.39: LinSig Traffic Model Output Results for Bird Avenue-R117 Junction

Scenario		R117 Southbound (A)		Bird Avenue (B)		R117 Northbound (C)	
		Degree of Saturation (%)	Mean Max Queue	Degree of Saturation (%)	Mean Max Queue	Degree of Saturation (%)	Mean Max Queue
Base Year	**AM**	39.6	6.8	68.4	4.1	66.2	12.2
	PM	45.5	8.0	54.1	3.8	53.9	8.2
Opening Year, no Development	**AM**	41.6	7.2	72.6	4.7	70.9	13.7
	PM	48.1	8.5	58.6	4.1	58.1	8.9
Opening Year, with Development	**AM**	42.0	7.3	79.4	5.1	76.5	16.2
	PM	49.5	8.9	62.3	4.5	60.8	9.4

8.9.6 The LINSIG results show that the existing Bird Avenue / R117 Junction will operate well within capacity with the peak hour development traffic in place. This confirms the existing junction has more than adequate capacity for the proposed development. The largest increase in the degree of saturation was shown to occur in Bird Avenue arm of the junction if no changes were made to the existing traffic signal phasing. However, the overall junction operates well within its overall capacity with the proposed development in place.

8.10 Luas Capacity and Frequency On-site Assessment of Luas Services

8.10.1 Exact details of Luas passenger numbers are not available as this information is commercially sensitive. ILTP undertook on site surveys to determine the up to date frequencies of the Luas services on 1st March 2022 and to also confirm that the capacity of the new upgrades are in operation. In AM peak periods the frequency of northbound Luas trams was recorded at the Windy Arbour Luas stop. In addition, the numbers boarding each Luas tram were also recorded.

8.10.2 The survey results for Northbound frequency are shown in Table 8.40.

Table 8.40: Windy Arbour Luas stop Frequency to City Centre AM Peak

Windy Arbour Luas Stop Frequency Northbound			
	Total No. of Trams	Average time interval between trams	Average No. of passengers boarding per tram
AM Peak 08:00 - 09:00	18	3.06 minute	10 passengers

8.10.3 The surveys also noted that all the trams on the line were the new 55m trams. It was also observed that there was sufficient spare capacity available on the Luas to accommodate the demands at the Luas stop.

8.10.4 Data for southbound trams were also recorded. These show lower frequencies southbound in the AM peak hour, which is to be expected as demand on the Luas is far greater than on the Luas northbound in the AM peak. The results are summarised in Table 8.41.

Table 8.41: Windy Arbour Luas Stop AM PEAK Hour – Survey Results

Trips Distribution Windy Arbour Luas Stop AM Peak (08:00 - 09:00)				
Total per Direction	No. of Trams	Trip Distribution	No. of passengers boarded	Passengers Distribution
Total Northbound	18	60%	178	82%
Total Southbound	12	40%	40	18%

8.10.5 Based on the results of the surveys in the AM peak hour the city bound Luas theoretical capacity was 7,344 per direction per hour (pdph) (408*18) and 6,606pdph using the assumed operational capacity. The recorded inbound frequency was just over 3 minutes for inbound trams.

8.11 Existing Bus Services Assessment

There are a variety of bus services in the vicinity of the proposed development. The bus routes and their frequencies in the area are illustrated in Figure 8.40. There are bus services along Dundrum Road, Goatstown Road and the R117 (Dundrum Village), all within a 15-minute walk of the proposed development.

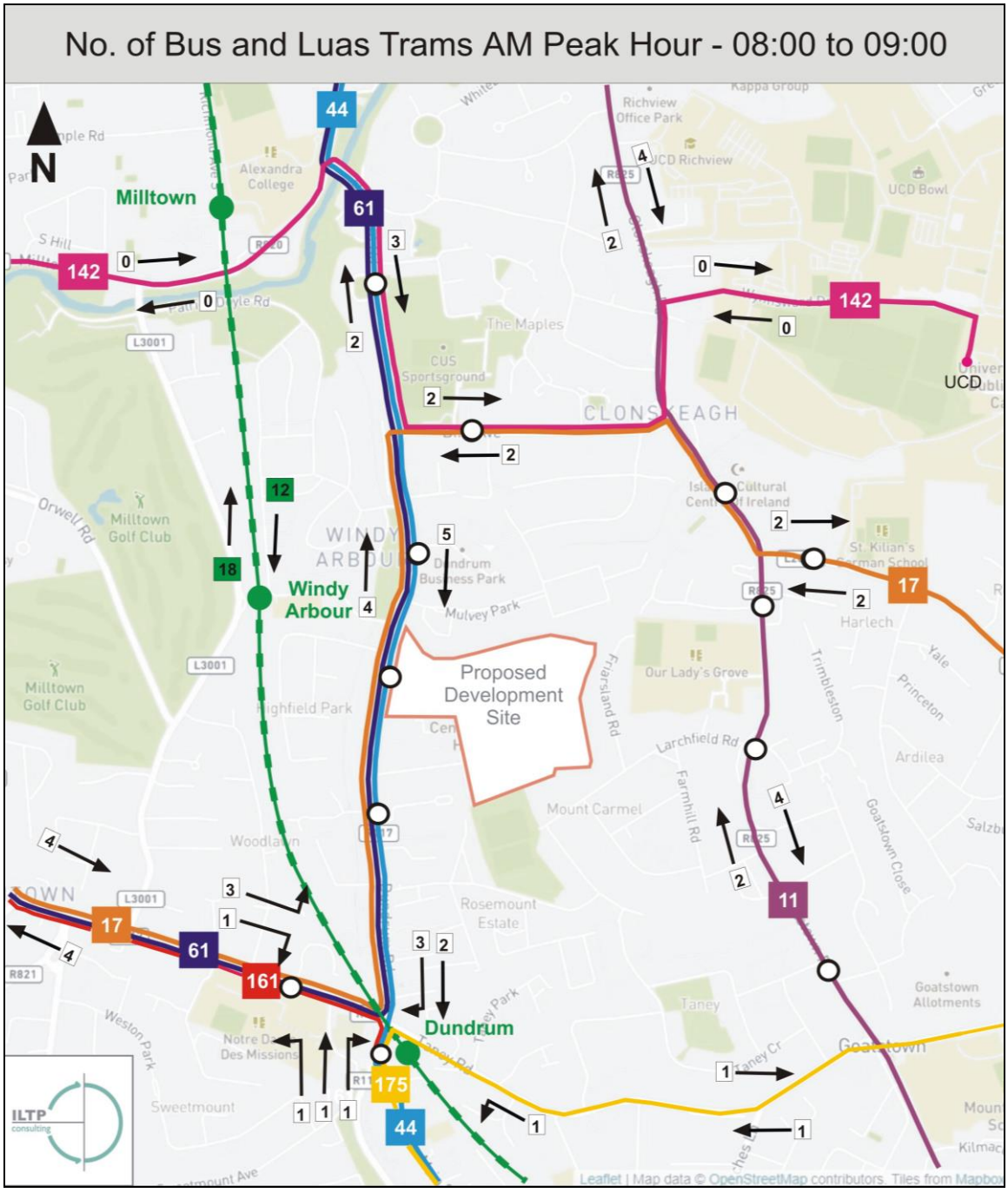


Figure 8.40: Number of Bus and Luas Trams AM Peak Hour

8.11.1 The individual bus routes and their frequency are described in Table 8.42.

Table 8.42: Bus Services Routes and Frequency During AM and PM Peak Hour

Service	Typical Frequency during Peak Periods		
	From	AM	PM
Dublin Bus Route 11: Sandyford Business District - Wadelai Park	Sandyford Business District	25 minute interval	20 minute interval
	Wadelai Park	15 minute interval	20 minute interval
Dublin Bus Route 44: Enniskerry – DCU via O'Connell Street	Enniskerry	1 per hour	1 per hour
	DCU	30 minute interval	1 per hour
Dublin Bus Route 61: Whitechurch – Eden Quay via Dundrum	Whitechurch	1 per hour	1 per hour
	Eden Quay	1 per hour	30 minute interval
Dublin Bus Route 142: UCD - Portmarnock via IFSC and Port Tunnel	UCD	–	–
	Portmarnock	–	25 minute interval
Go Ahead Route 17: Rialto - Blackrock	Rialto	20-30 minute interval	20-30 minute interval
	Blackrock	20-30 minute interval	20-30 minute interval
Go Ahead Route 161: Rockbrook - Dundrum	Rockbrook	1 per hour	1 per hour
	Dundrum	1 per hour	1 per hour
Go Ahead Route 175: UCD - Citywest	UCD	1 per hour	1 per hour
	Citywest	40 minute interval	1 per hour

8.11.2 This assessment shows that there is currently a variety of bus services available to supplement the Luas service currently in place.

8.11.3 These bus services serve a wide variety of destinations that further enhance public transport in the area. These bus services are available to serve the existing and new development in the area. In total, there are 19 buses along these routes. The average operating capacity of an urban bus is approximately 90 passengers per bus. The capacity of the existing bus services in the area are summarised in Table 8.43.

Table 8.43 Estimated Passengers Capacity AM Peak Hour

Estimated Passengers Capacity AM Peak hour (08:00 - 09:00)			
Bus Service To/From	No. Buses per hour	Operational Capacity (passengers per bus)	Total Capacity(passengers per bus)
Dundrum Road	9	90	810
Goatstown Road	6		540
Dundrum Village	4		360
TOTAL	19		1710

8.11.4 These bus services are set to be enhanced through the BusConnects projects and bus capacity are planned to be increased by 25% over the coming years. Therefore, bus service capacity and network will be improved further over the period to 2030.

8.12 Public Transport Demands

8.12.1 The opening year mode share is anticipated to be 25% using Luas. It is estimated that 80% of persons leaving the proposed development by Luas in the AM Peak will travel towards to City Centre.

8.12.2 Based on current frequencies of 18 trams per hour, this equates to approximately 6 to 7 additional persons per tram city bound in the AM peak, which can be accommodated by the existing Luas services. Based on the findings of the on-site surveys, it is anticipated that there is adequate spare capacity on the Luas Green Line to cater for this slight increase in demand.

8.12.3 Based on current bus frequencies on the buses in the area and a mode share of 5% the estimated additional passengers per bus are set out in Table 8.44.

Table 8.44: Estimated Bus Service Demand AM Peak Hour

	Estimated Additional Passengers per Bus AM Peak hour (08:00 - 09:00)		
	No. Passengers	No. Buses per hour Dundrum Road /Goatstown Road/Dundrum Village	Additional passengers per bus/ per hour
Departing	28	8	2
Arriving	12	11	
TOTAL	40	19	

8.12.4 Based on current frequencies this would result in an additional 2 passengers per bus during the AM peak hour period. Based on the findings of the on-site surveys, it is anticipated that there is adequate spare capacity on these bus services to cater for this slight increase in demand.

8.12.5 The improved walk and cycle facilities included in the development would further improve connectivity to the bus and Luas services in the area.

8.13 Summary of Assessment

8.13.1 The twin access proposed for the proposed development off Dundrum Road ensure that traffic to and from Dundrum is not concentrated at a single point and traffic to and from the proposed development can choose either access route. This also reduces the traffic movement within the development.

8.13.2 Traffic assessments have also been carried out at the Dundrum Road/Mulvey junction to the north and the Dundrum Road/Frankford/Rosemount Junction to the south and at Bird Avenue to the North for all junctions where traffic is forecast to increase by 5% or more in accordance with the assessment guidance.

8.13.3 While traffic increases are assumed at these junctions, the assessment demonstrates that the proposed development traffic can be adequately accommodated by the existing network.

8.13.4 Beyond these junctions, traffic associated with the proposed development is more dissipated through the network and the overall traffic impacts of the proposed development reduced.

8.13.5 The overall analysis confirms that the proposed development will have no significant adverse long-term impact on the capacity or operation of the surrounding road network. Traffic growth beyond the assessment opening year, therefore, represents the worst-case scenario in terms of likely traffic impacts as traffic is likely to decline over the period to the 2039 design year.

8.13.6 The Luas Green Line capacity enhancements are now complete and significant additional capacity is available to accommodate increased demands from the proposed development. There are also a variety of bus service available to service the proposed development. Both the Luas and bus services are proposed to be further upgraded over the coming years to accommodate future demand for public transport in the vicinity of the proposed development and indeed the wider area.

8.13.7 It is further noted that if current NTA mode share targets are met, then reductions in background traffic can be expected in the short to medium term in line with greater shift to more sustainable modes of transport. Therefore, over time overall traffic in the area is likely to decline in line with increased Capital Investment in non-motorised modes of travel and based on the evidence of recent traffic trends as set out in the TTA.

8.14 Other Considerations

8.14.1 The assessment did not include for any reduction in existing traffic arising from the recent public transport improvements in the area. Likewise, some of the existing residents will avail of the proposed cycle and pedestrian route through the site, thus increasing walk and cycle mode share in the area. Some will also use the non-residential elements of the proposed development. These positive outcomes have not been assumed in the traffic and transport assessments. The assessments, therefore, represent the worst-case scenario in terms of traffic impact.

8.14.2 As set out earlier in this report traffic flows as set to reduce over time in urban areas well served by public transport such as the proposed SHD development lands. Also, the reduced car parking proposed coupled with the measures as set out later in the MMP will result in reduced car use and greater use of alternative travel modes over time.

9 MOBILITY MANAGEMENT PLAN – INTRODUCTION AND OBJECTIVES

9.1 What Is Mobility Management?

9.1.1 Mobility Management aims to promote sustainable transport and manage the demand for car use by changing travellers' attitudes and behaviour. Mobility Management is about improving a site's layout by designing for and enabling and promoting sustainable travel options (e.g. walking, cycling and public transport) to residents. The use of Mobility Management is well established in Ireland through the Development Control process and policy documents. The process involves key stakeholders such as the Local Authority, public transport operators, the developer and future residents. The MMP is regarded as a mitigation measure to help promote sustainable travel and to lessen the traffic impact of any development.

9.2 The Benefits of Mobility Management

9.2.1 Implementing a Mobility Management Plan has the following potential local benefits:

- Promoting alternative uses to the car can result in less congestion and therefore improves safety on local roads by promoting alternatives to the car.
- Reduced highway capacity problems can enable more sustainable travel choices.
- The local environment will be improved from reduced congestion, carbon emissions, pollution and noise.
- A range of travel options makes the development site attractive to potential residents.
- Increases opportunities for active healthy travel, such as walking and cycling.
- Reduces demand for parking spaces, enabling land to be put to more cost-effective or commercially beneficial use and freeing space for active travel initiatives.
- Improved travel choice, quality and affordable access to services for all users.
- Helps achieve Ireland's Climate Action targets.

9.3 Mobility Management Plan Objectives

9.3.1 The overarching objectives of the MMP are to reduce levels of private car use by encouraging people to walk, cycle, use public transport and car-share facilities. It can also reduce the number and length of trips undertaken / required through the provision and promotions of on-site local services.

9.3.2 The specific objective(s) of an MMP can vary depending upon the organisation, site characteristics and specific land uses which vary with each site. Nevertheless, in the context of a residential MMP, objectives can include:

Residents

- Address residents' need for sustainable access to a full range of facilities for work, education, health, leisure, recreation and shopping.
- Promote healthy lifestyles and sustainable, vibrant local communities by improving the environment and the routes available for cycling and walking.

The Local Community

- Make local streets less dangerous, less noisy and less polluted and enhance the viability of public transport

- Reduce the traffic generated by the development for journeys both within the development and on the external road network
- Promote equal opportunities by offering wider travel choices
- Improve personal and wider community health
- Reduce air and noise pollution.

9.3.3 MMPs are evolutionary documents that should be regularly updated. In this way, MMP targets and plans can be reviewed and tailored to take account of ongoing changes in travel patterns. It is therefore intended that this MMP is the starting point of a live process and will be updated on an annual basis or when required by other circumstances.

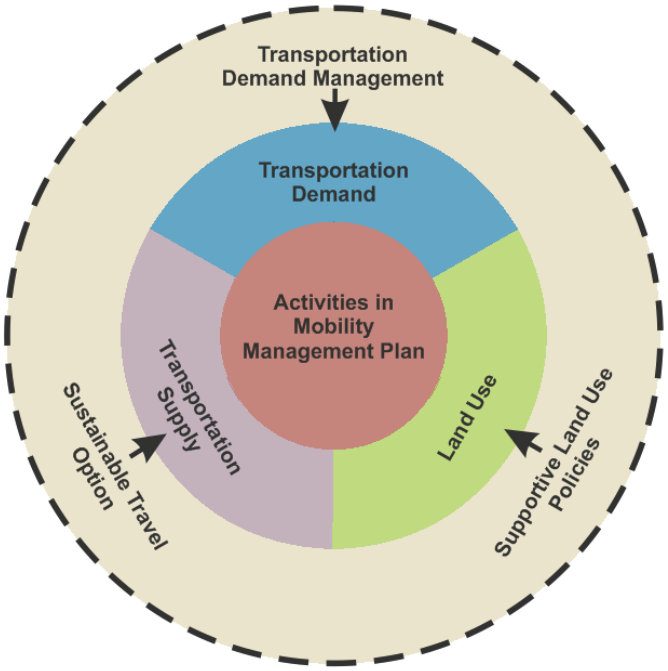
9.4 Summary of Policy & Targets

9.4.1 The transport strategy must be reflective of its wider context including land-use policies and objectives, population growth, investment in sustainable transport and climate action. The wide range of transport and sustainability policies and objectives and their applicability to the subject planning application are set out in this report. The overall trust is to reduce dependency on private cars and to promote more sustainable and public travel modes in urban areas in particular. In recent years, Dublin has seen significant increases in rail (including LUAS) and bus services coupled with some reductions in radial and city centre traffic flows. Policy at all levels coupled with increased investment in sustainable travel modes will drive this trend over the coming years.

9.5 Mobility Management Plan Approach

9.5.1 A Mobility Management Plan (MMP), or Travel Plan, is a wide range of policies, programmes, services and products that influence how, why, when & where people travel to make travel behaviour more sustainable.

9.5.2 Figure 9.1 represents graphically the interlinking approaches and strategies utilised in the preparation of the Mobility Management Plan. Within this MMP we have sought to consider transportation demand, transportation supply and land use.



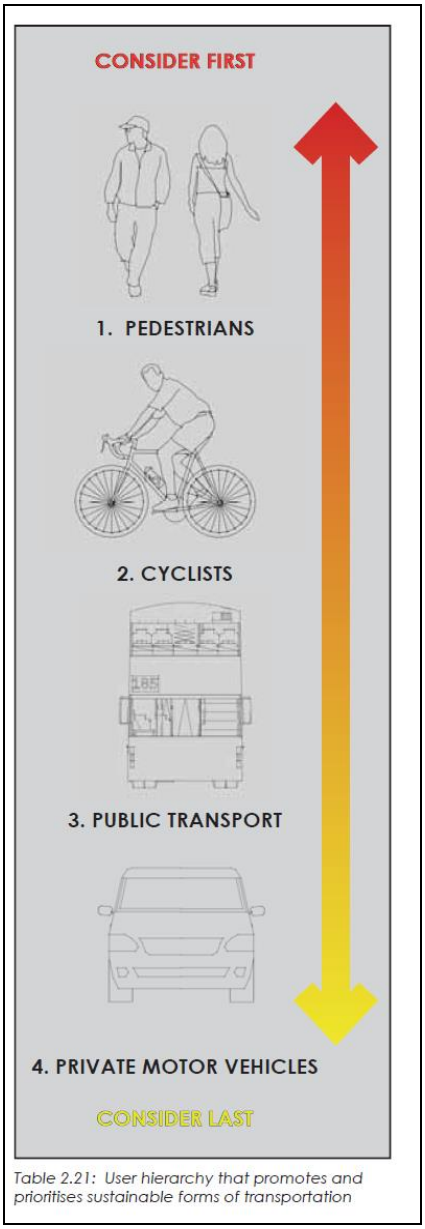


Figure 9.1: Mobility Management Plan Strategies and User Priorities

9.5.3 Mobility Management can be described, as a transport demand management mechanism that seeks to provide for the transportation needs of people and goods. It can be applied as a strategic demand management tool or as a site-specific tool measure. The aim is to reduce the demand for and use of cars by increasing the attractiveness and practicality of other modes of transport. Mobility Management encourages individuals, companies or institutions to satisfy their transport needs by the efficient and integrated use of available transport facilities.

9.6 Objectives of Mobility Management Plan

9.6.1 The purpose of the mobility management plan is to reduce the number of trips generated by a particular development and help ensure that greater numbers use public transport, cycle and walking modes. A mobility management strategy would therefore act as a form of mitigation by reducing the overall levels of traffic that would otherwise be on the surrounding roads in the future.

9.6.2 This Mobility Management Plan includes provision for the appointment of a Mobility Manager and details of access to the appointed Mobility Manager by the residents in the development.

10 MMP TARGETS, ACTION PLAN, MONITORING & REVIEW

10.1 Overview

10.1.1 The purpose of a Mobility Management Plan is to reduce, in overall terms, the amount of trips generated by a particular development and to ensure that a greater number of these reduced trips use sustainable transport modes. A mobility management strategy acts as a form of mitigation by reducing the overall level of traffic that would otherwise be on the surrounding roads in the future.

10.1.2 The LDA is ideally positioned to develop, manage and implement sustainable mobility measures at both the planning and post planned stages of the proposed development as it will retain longer term responsibility for the overall development post-completion. The overall development is also designed to provide for an appropriate mix of uses that help ensure that external movements are reduced and that access via walking cycle and public transport modes are promoted over that of the private car.

10.2 Aims and Objectives

10.2.1 The overall aim of the MMP for the proposed development is to minimise the proportion of single-occupancy vehicle trips and address the forecast transport impacts of the end-users of the site. The objectives can be summarised as follows:

- Consider the needs of residents in relation to accessing facilities for employment, education, health, leisure, recreation and shopping purposes, including identifying local amenities available that reduce the need to travel longer distances;
- Reduce the vehicular traffic generated by the development to a lower level of car trips than that predicted within the Traffic and Transport Assessment – including developing measures to reduce the need to travel, such as the provision of ancillary facilities (gym, food/beverage facilities, convenience retail and quality outdoor spaces).
- Implement good urban design by ensuring permeability of the development to neighbouring areas and the provision of sustainable travel alternatives.

10.3 Proposed Modes Share Targets

10.3.1 The proposed SHD development is strategically located with good bus and light rail public transport facilities. The proposed development also includes for generous cycle parking provision and lower car parking numbers to below CDP standards, which is expected to promote greater uptake of more sustainable travel patterns.

10.3.2 Based on the above principles and the current attributes of the proposed development the target modal split targets for the proposed development are:

- Bus: 10%
- Luas: 25%
- Walking: 18%
- Cycling: 10%
- E-mobility 3%
- Private Car (Driver) 26.7%
- Private Car (Passengers) 3.3%
- Car Share Schemes 4%

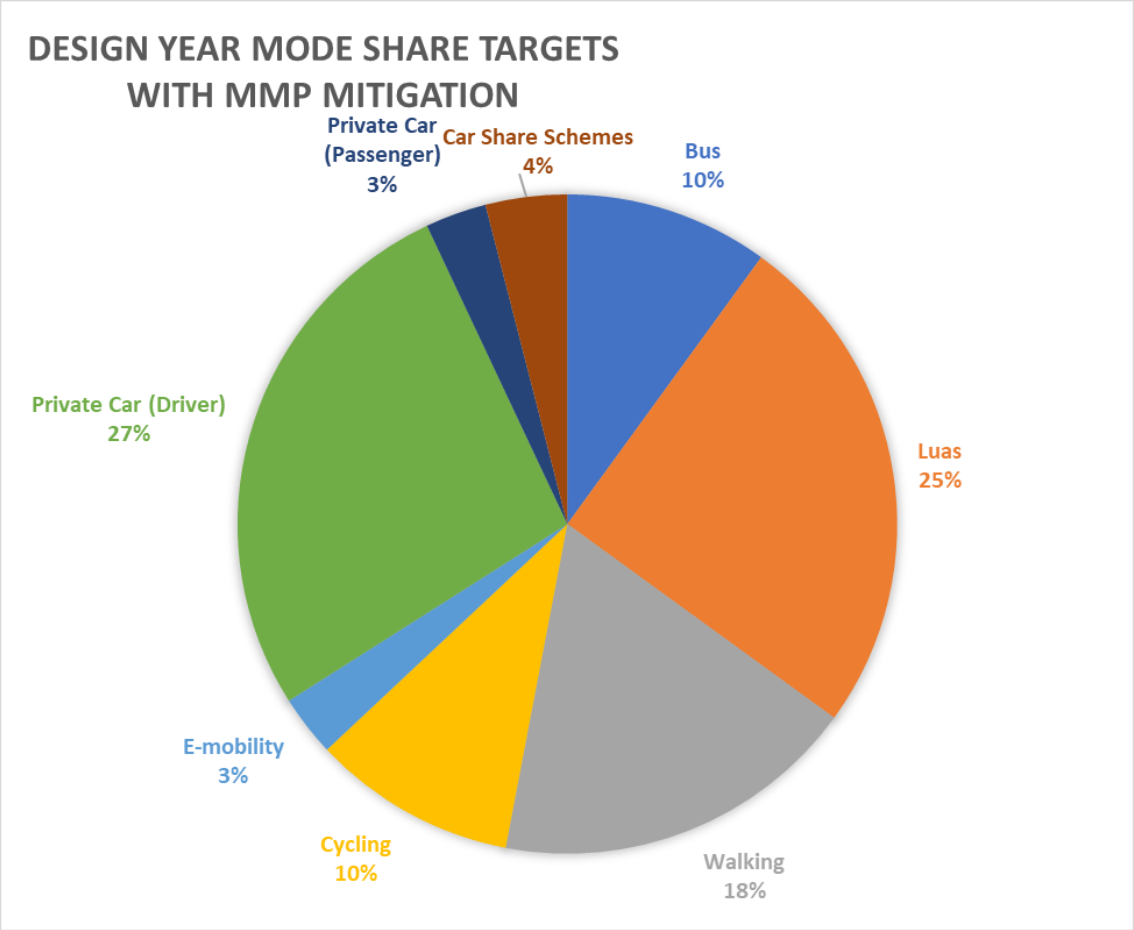


Figure 10.1: Mode Share Targets for Proposed SHD Development

10.3.3 The mode share targets are illustrated in Figure 10.1 by mode share. The modal split for the proposed SHD development will be surveyed on an annual basis to ascertain if targets are being met and to identify methods by which the modal split may be further improved.

10.4 Proposed MMP Action Plan Measures

10.4.1 Mobility management plans have a wide range of possible "hard" and "soft" tools from which to choose from with the objective of influencing travel choices. The following section introduces proposed MMP measures that can be implemented once the site is occupied. The finalised measures within the MMP will be informed by the insight gained by the Post-Occupation Baseline Travel Survey results.

10.4.2 The proposed MMP Action Plan is summarised into the following sections:

- Mobility Manager Appointment
- Reduce the need to travel and promote sustainable travel modes
- Welcome Travel Pack
- Marketing and Travel Information
- Personalised Travel Planning

- Walking
- Cycling
- Public Transport
- Managing Car Use

10.5 Mobility Manager

10.5.1 Most fundamental to the success of such a venture is the appointment of a Mobility Manager by the Management Company for the residential units. This individual will be responsible for the delivery of the programme and will act as an interface between the various stakeholder groups within the development.

10.5.2 The Mobility Manager will also be involved in monitoring the mode of travel from the residential development. This ideally will be done on an annual basis. Monitoring of travel patterns will facilitate the provision of sustainable transport modes and ensure that once modal targets are met that there is no slippage and instead efforts made to further improve the situation.

10.5.3 A Mobility Manager for the proposed residential development will be appointed after the completion and prior to occupation of the first residential block. The Mobility Manager will have a role in promoting and monitoring the provisions of travel plans within the residential development.

10.5.4 The Mobility Manager will at the outset of the occupation of the first block of residential units implement a number of key measures. These will include

- Providing new residents with a Travel Welcome Pack giving full details of transport options, cycle/walking maps and information on local services
- Instigate and regularly update a travel notice board in each of the blocks providing travel information. This may also be provided online subject to demand.
- Promote the use of public and residential car share schemes within the development

10.6 **Reducing the Need to Travel**

10.6.1 The provision of on-site services to reduce the need of residents to utilise a vehicle to travel is crucial to embedding a sustainable travel culture within the site from the outset. On-site services are included as part of the overall SHD planning application but will need to be actively promoted to occupants. On site facilities included as part of the proposed overall development that will help reduce the need to travel include:

- Retail, Food & Beverage
- Gym and recreational facilities
- Recreational and play areas
- Business area / co-working spaces (part of separate S34 planning application within the lands)
- Childcare Facility

10.7 Welcome Travel Pack

10.7.1 A 'Welcome travel pack' can be provided to all new residents with the intention that each resident 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.

10.7.2 The Welcome 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 services (including cycle parking, cycle hire and the Car Club) and on-site facilities (e.g. parcel collection).

10.7.3 Incentives to trial sustainable travel can also be considered as part of the MMP process and could include some of the following:

- Public transport 'taster tickets' via a Leap 'pay as you go' card for each resident.
- Information on services and amenities provided locally (both on-site and nearby), particularly those within walking and cycling distance.
- Maps showing the pedestrian and cycle routes in proximity to the site, including site cycle parking and cycle hire locations; advised routes (with journey times) into the city centre and also to public transport interchanges.
- Information about local public transport services and tickets, including a plan showing the location of bus and Luas stops, and bus routes to rail stations.
- Information on the health benefits of walking and cycling.
- Details of car-sharing services 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.
- Provide information on the financial and environmental costs associated with driving and support regarding tips for green driving techniques.

10.8 Marketing and Travel Information

10.8.1 Marketing and raising awareness will involve directly engaging with individuals and raising awareness of travel options as well the benefits of sustainable and active travel.

10.8.2 The Mobility Manager can market and promote the MMP to residents of the site in the following ways:

- Production and distribution of the Welcome Travel Pack as described above
- Producing dedicated printed Travel Options Leaflets (in addition to the Welcome Packs) and online information which can be personalised to suit the individual needs of the site.
- Once travel surveys have been undertaken, additional leaflets can be provided which are tailored to encourage travel by a specific mode of transport.
- Organising events and activities (e.g. Dr Bike sessions, Pedometer challenges, led walks, cycle training) to coincide with Bike Week, European Mobility Week and any other national / local sustainable travel or community events.
- Displaying regular updates on MMP targets and activities in communal areas of the residential development.

- Promotion of sustainable travel options to residents, focusing marketing initiatives on areas where there is willingness to change and promoting positive messages e.g. getting fit and active, reducing congestion and CO2 emissions.

10.9 Walking Initiatives

10.9.1 Depending on the outcome of the Post-Occupation Baseline Residents Travel Survey, the following measures could be implemented to promote walking to residents:

- Participation in a Residents' 'Pedometer Challenge'.
- Display local walking maps in communal areas (and online if applicable).
- Highlight the direct savings and health and wellbeing benefits of walking.

10.10 Cycling Initiatives

10.10.1 High quality cyclist routes will be provided as part of the design of the development, in addition to secure and accessible cycle parking. To maximise the potential for cycling by residents, the following facilities could also be provided (and promoted to residents):

- Display local cycle route maps in communal areas (and online if applicable).
- Highlight the direct savings and health and wellbeing benefits of walking.
- Organise cycle training in conjunction with planning authority
- On-site cycle hire provision (e.g. through Bleeper Bikes) for use by residents

10.11 E-Mobility Measures

10.11.1 A range of e-mobility measures will also be provided for in the overall development and implemented on a phased basis and subject to ongoing review. These include:

- E-Bikes
- E-Scooters
- Cargo Bikes
- Car share apps

10.12 Public Transport Initiatives

10.12.1 The following measures can be implemented to promote public transport to residents:

- Provide timetables and maps of local bus routes and the nearest bus stops, (including walk times) in communal areas.
- Promotion of the National Public Transport Journey Planner for travel by bus and rail.
- Promotion of the availability of Real Time Information on the Dublin Bus and NTA app and website (e.g.: www.dublinbus.ie) which provides live information on bus departure times for main bus routes that serve the site).
- Where necessary, liaise with the NTA and local bus operators about any feedback gained from residents such as location of bus stops, timing of routes, or where you have market information about a potential new or improved frequency on existing routes.

10.13 Managing Car Use

10.13.1 The following measures can also be implemented to help manage residents' car use:

- Promotion of car-sharing services (e.g. Liftshare) in communal areas and online.
- Organise car-share matching events or web page for residents. This can match residents willing to offer / find a lift for specific journeys.
- Marketing of the financial and carbon benefits of car-sharing incorporated in communication messages to residents.
- Promote green driving techniques and tips.
- Promote the benefits of EV vehicles

10.14 Prioritising Non – Car Ownership Within the Proposed Development

10.14.1 Central to promoting and supporting a demand management approach to reducing the demand and impact of growth in private car usage, the proposal here is to encourage and prioritize travel by sustainable alternative modes, through provision of infrastructure to support walking, cycling and use of public transport, e-mobility, car clubs where possible. In addition, a significant proportion of the units will be provided and promoted for people that do not own or do not wish to own a private car. Measure to promote same could include:

- Target relevant parts of the development for residents who do not wish or need to own a private car.
- Provision of infrastructure to support e-mobility options such as EV charging infrastructure within the proposed development.
- Provision of car sharing services within the proposed development to be facilitated by the management company

10.15 MMP Monitoring and Review - Overview

10.15.1 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.

10.16 Travel Survey

10.16.1 It is recommended that a travel survey of residents is undertaken initially 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.

10.16.2 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.

10.17 Annual Monitoring

10.17.1 The Mobility Manager will carry out annual follow-up travel surveys with future residents. 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.

10.17.2 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 residents.
- Allows targets that have been set too low or unrealistically high to be readjusted.

10.18 Reporting

10.18.1 Reporting of the results of the baseline travel survey and findings from the ongoing monitoring activities and progress with implementation will be agreed with the planning authority.

10.18.2 In the event that initial targets set out in the MMP are not met, this will not be seen as a failure, rather as a calibration exercise for future target setting and MMP Action Plan refresh and review.

10.19 Summary

10.19.1 The Mobility Management Plan is the principal mitigation measure proposed by the TTA to address the forecasted transport impacts of the development and has been prepared as a Pre-Occupation Plan to support the planning application.

10.19.2 The development site borders a well-established walking and cycling network with a range of footways and cycle routes, tactile paving and dedicated pedestrian and cycle crossing facilities. The proposed development is designed to link to the existing facilities and includes for a new strategic pedestrian cycle link through the lands that will benefit both the new and existing residents of the area.

10.19.3 The site is served by the high-capacity and high-frequency Luas service and by a number of bus services. The sites are also within walking distance to a number of employment centres, local retail, education and leisure facilities. The proposed development design layout also significantly increases the 15minute walking catchments for both new and existing residents of the area. It can be concluded that the proposed development has a very high level of accessibility by sustainable transport modes.

10.19.4 A Mobility Manager will be appointed to co-ordinate the delivery of the Post-Occupation Baseline Travel Survey, the finalisation of MMP targets and the development and implementation of the Post-Occupation Residential MMP. The Mobility Manager will also ensure ongoing promotion and marketing of sustainable travel options to the residents of the development.

10.19.5 In addition to high quality cycling and pedestrian facilities inherent within the design (including cycle parking), car share clubs and other support measures will be provided to enhance sustainable travel choices for residents and limit the need for car ownership amongst residents.

10.19.6 The preparation of the Welcome Travel Pack will provide encouragement to residents to consider their travel choices. The Welcome Travel Pack will include information to encourage residents to travel sustainably from the outset. The travel pack will be issued to all residents and will include a variety of information and incentives on sustainable travel.

10.19.7 Other measures will be determined by the results of the Post-Occupation Baseline Travel Survey and will include the following:

- Marketing and promotion
- Measures to promote and support walking and cycling
- Measures to promote and support bus and Luas use
- Measures to promote car-sharing and to manage car use.
- Measure to manage car, cycle and motorcycle parking within the development

10.19.8 The MMP is a continuous and evolving document which requires monitoring, review and revision to ensure it remains relevant. This will become the responsibility of the management company. The target set would result in a significant reduction in the traffic impact of the development and a corresponding increase in the use of more sustainable travel modes.

11 CONSTRUCTION STAGE TRAFFIC IMPACT ASSESSMENT & MMP

11.1 Construction Activity

11.1.1 The separate Construction & Environmental Management Plan (CEMP) report sets out the construction phasing.

11.1.2 The likely traffic impacts associated with the construction phase of the proposed development have been assessed in this section.

11.1.3 The works will be phased in such a way as to allow the road network to remain open with existing capacity maintained at all times. Any short terms road closures or traffic management measures required to facilitate construction or services provision will need to be agreed in advance with Dun Laoghaire Rathdown County Council.

11.1.4 The following assumptions were made as part of the evaluation process:

- 08:00 to 19:00 operation per day Monday - Friday
- 08:00 to 14:00 operation Saturday

11.1.5 A more detailed construction traffic management plan will be prepared by the contractor undertaking the construction works and submitted to the Planning Authority for approval prior to commencement of construction of the development.

11.2 Proposed Construction Program and Sequencing

11.2.1 The overall phasing of the construction is set out in the CEMP. In terms of traffic management, the proposed new southern access will be constructed as part of Phase 1 of the overall development. The final phase of the development included the proposed housing element along this southern access route also. This will allow for the better segregation of construction and new residential traffic during the phased construction process. Further details on phasing are provided in the architects' phasing drawing and in the masterplan report.

11.3 Proposed Haul Route for Construction Traffic

11.3.1 Various route proposals for accessing the site were considered. It was decided that the route with the least impact on the adjoining residential street network would be the most prudent, as it would reduce conflict with other vehicles and local residents.

11.3.2 The site adjoins the R117 Regional Road which means that all HGV movement associated with the construction stage of the proposed development can be required to only use the regional and national road networks to the south of the proposed development.

11.3.3 The proposed Haul Route for the construction works for the proposed development is shown in Figure11.1.

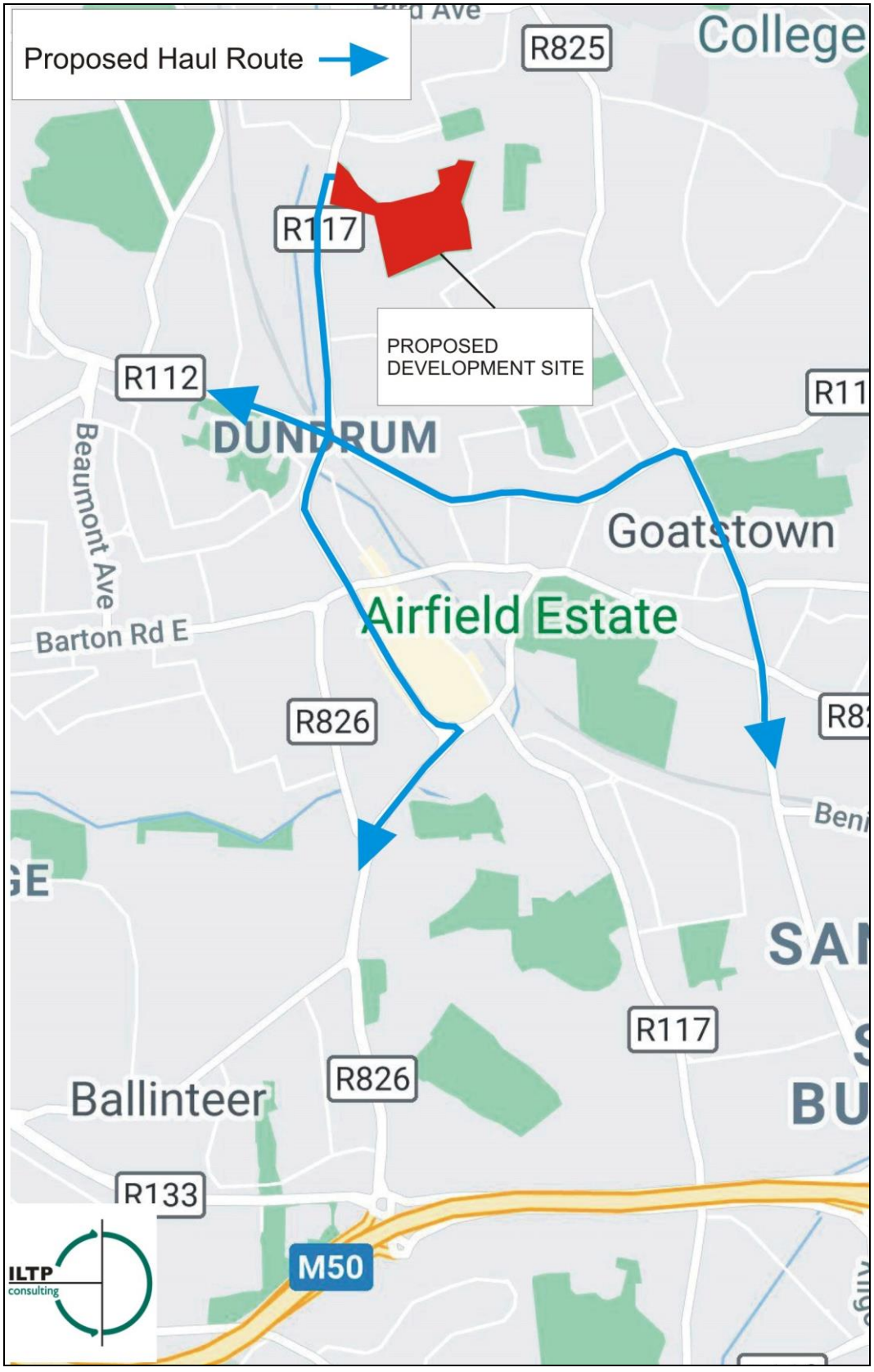


Figure11.1: Proposed Primary Haul Route for Construction Works for Proposed Development

11.3.4 No HGV construction traffic will be required use any local roads or streets to access and egress the site.

11.4 Construction Stage Traffic Assessment

11.4.1 The estimated large construction vehicle (HGVs) movements during the construction phase of the overall development are set out in the CEMP. The overall estimated HGVs movement are set out in Figure 6.1 of the CEMP and reproduced here as Figure 11.2.

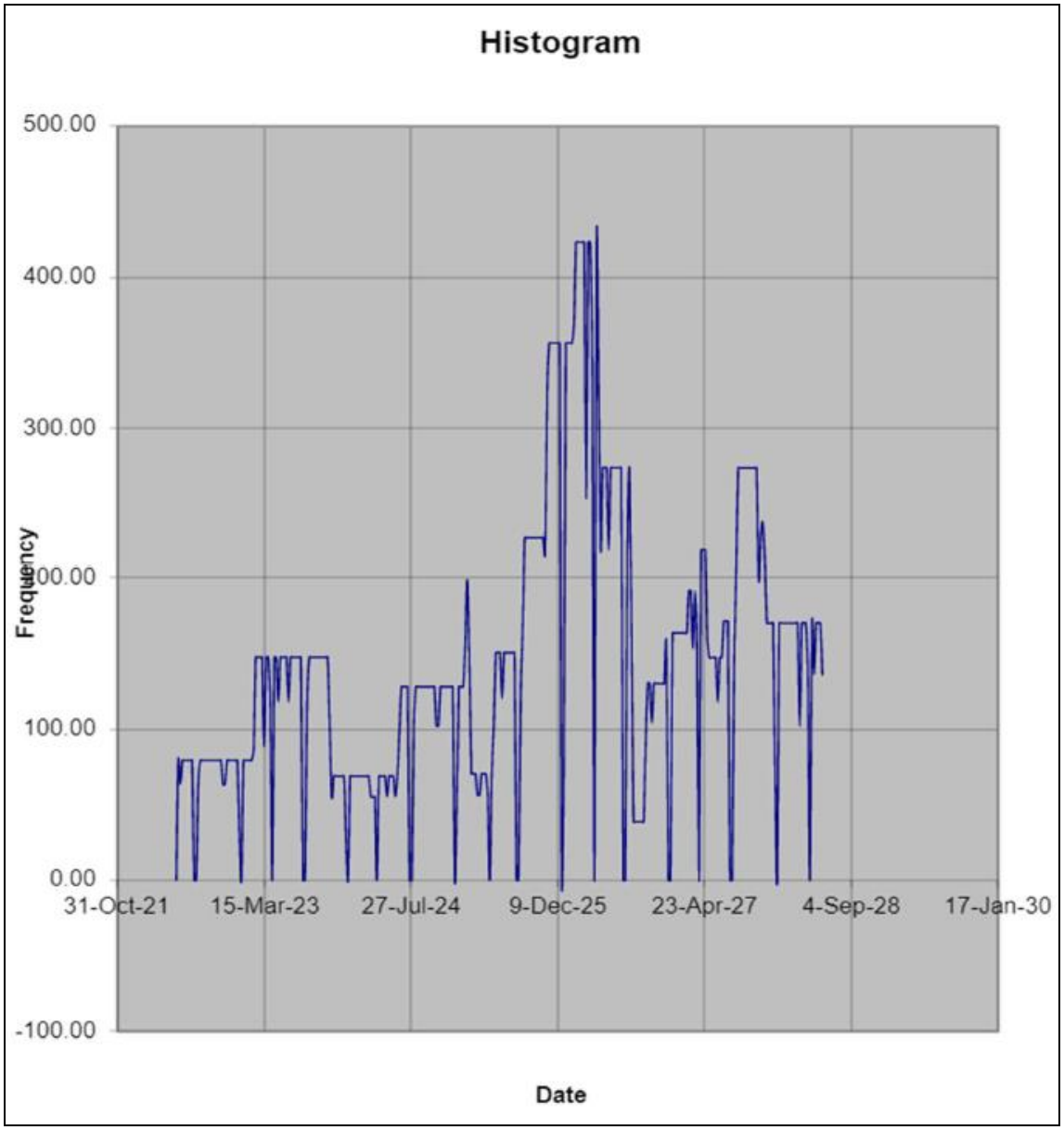


Figure11.2: Approximate Weekly Construction Vehicle Trip Movements To/From Site
(Source: CEMP Report)

11.4.2 The peak construction related HGV movement will occur during 2026, where between 400 to 500 HGV movement to and from the site per week are expected to arise.

11.4.3 The site construction will operate for approximately 60 hours per week and these movement will be spread throughout the day, exporting and importing construction materials to and from the site. This would average at 10HGV movement per hour at the peak construction period. All these HGV movements would be required to use the proposed haul route.

11.5 Construction Workers Traffic Estimates

11.5.1 Excluding HGV drivers, it is estimated that the construction works would require personnel parking on site, including full time construction workers and contractors.

11.5.2 It is projected that the works will result in approximately 300 to 400 construction workers on site during the typical construction period, with a maximum of 800 construction personnel on site concurrently during the period of peak construction activity. Given typical construction working hours the majority of these personnel are expected to arrive to site in advance of the 08:00 – 09:00 morning peak hour and depart after the 17:00 - 18:00 evening peak hour periods.

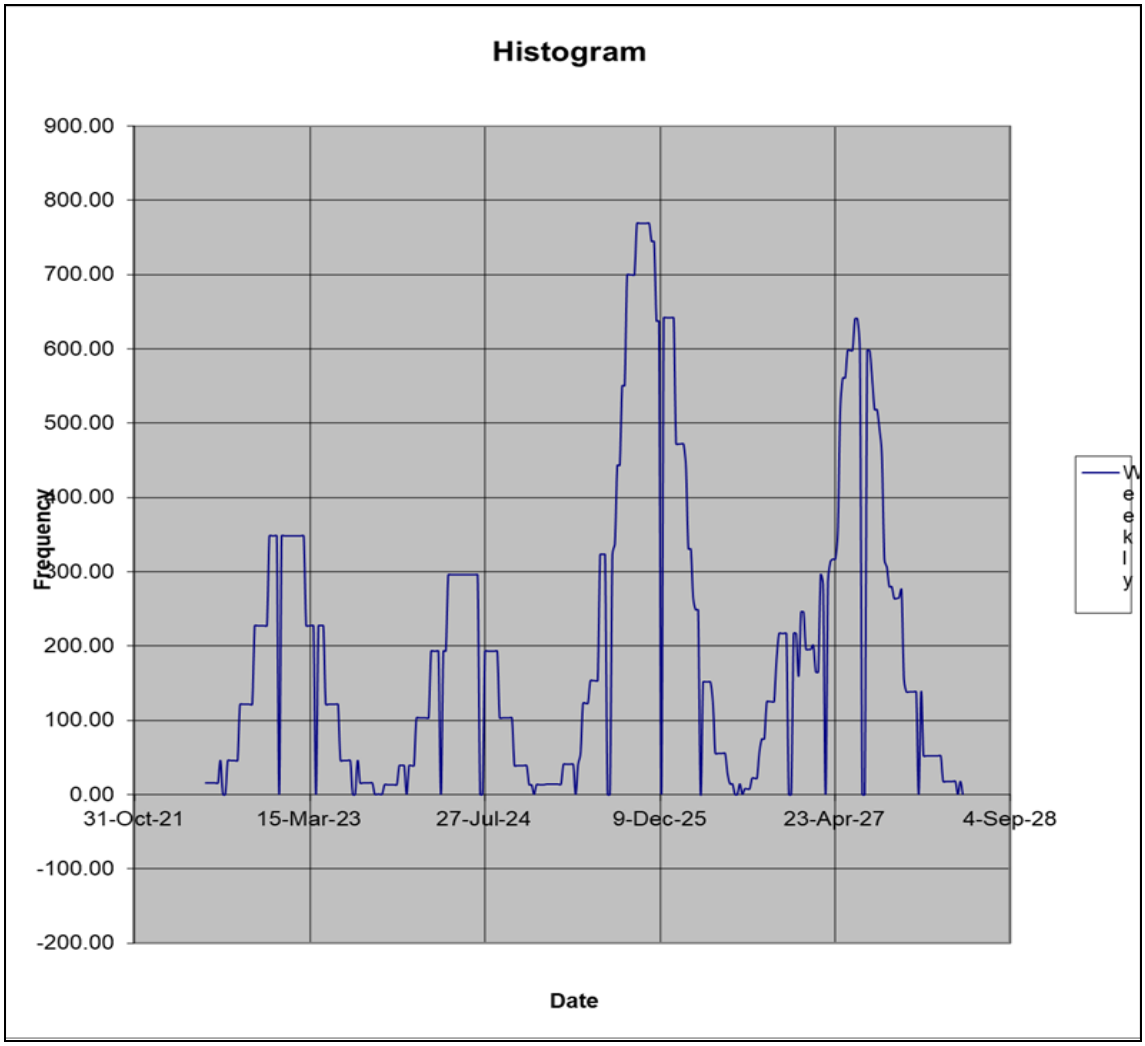


Figure 11.3: Approximate Weekly Construction Workers Trip Movements To/From Site ***(Source: CEMP Report)***

11.5.3 Some construction workers will arrive on foot, cycle or use public transport. In addition, many construction workers come to site in groups by car or van. Vehicular movements carrying construction personnel can be broken down as follows:

- 800 peak staff working on site (Max)

- 40% arrive during AM or PM Peak Hours 320
- 30% arrive via public transport, walk or cycle 96
- Totals arrive via car/van 224
- Average Car Occupancy = 2.2 (including driver) 2.2
- Maximum additional movements AM/PM Peak (800 staff) **102 cars/vans**
- With up to 400 staff normally on site
- Normal additional movements AM Peak **51 cars/vans**

11.6 Overall Construction Traffic Impact

11.6.1 Overall, the traffic movements for construction related traffic and construction workers at the peak stage of construction would equate to approximately 2 vehicles every minute arriving or departing the site during the morning and evening peak hours. This level of traffic will in overall terms will have no material traffic impact on Dundrum Road.

11.6.2 This volume of construction traffic during peak traffic hours is lower than the peak volumes projected for the operational phase of the development and therefore construction related traffic has no material additional impact on existing levels of traffic on the surrounding road network.

11.6.3 Therefore, in Traffic Impact Assessment terms, the most onerous scenario to assess in terms of capacity and traffic impact is the operational stage of the development.

11.7 Cumulative Construction Traffic Impact

11.7.1 The operational stage of the development was estimated to generate an additional 314 movements (97+217) in the AM peak hour, while the construction traffic was estimated to generate a maximum of an additional 112 (10 +102) movements in the AM peak hour.

11.7.2 The cumulative construction stage traffic impact of the other developments along Dundrum Road and in the vicinity of the proposed development are also forecasted to be lower than the operational stage traffic impact. If the construction of these other developments is ongoing, during either the construction or operational stages of our development, then the construction stage cumulative traffic impact would be less than the cumulative traffic impact of the operational stage of these other developments. Therefore, there was no necessity to undertake a separate detailed traffic assessment of the cumulative traffic impact for the construction stage.

11.8 Construction Traffic Management Measures

11.8.1 The Construction Traffic Management Plan will include detailed measures to mitigate the impact of construction traffic, which include:

<u>General:</u>

- Inside the site boundary, a clear pedestrian access will be provided to the areas of work and appropriate signage placed. Pedestrian boundaries will be delineated with pedestrian barriers.

- Tracked excavators will be moved to and from the site on low-loaders and will not be permitted to drive onto the adjacent roadway.

- Vehicles delivering or removing material with potential for dust emissions to an off-site location shall be enclosed or covered with tarpaulin to restrict the escape of dust.

- All public and private roads and footpaths shall at all times be kept entirely free of excavated materials, debris and rubbish.

- A wheel wash facility will be employed at the exit of the site so that traffic leaving the site compound will not generate dust or cause the build-up of aggregates and fine material in the public domain.

- The applicant is committed to implementing sustainable construction practices and as such will be seeking to reduce the quantities of waste material being carried off the site to a minimum.

- A site liaison officer will be identified as a single contact point for the Planning Authority and local community to deal with any issues that may arise in a prompt and efficient manner.

- Construction work will be limited to normal working hours; that are 08.00 – 19.00hrs on weekdays and 08.00 – 14.00hrs on Saturdays. It is proposed that any hours of work outside of these times would only be allowed following prior agreement with the local authority.

- All deliveries of materials, plant and machinery to the site and removals of waste or other material will take place within the permitted hours of work. Vehicle movements will be planned to ensure arrival and departure times are maintained inside the agreed working hours.

- Deliveries will be co-ordinated to prevent queuing of vehicles adversely affecting traffic flow and to minimise disruption to local traffic. They will be timed and coordinated to avoid conflict with collection of waste, other deliveries (particularly to adjoining owners), and rush hour traffic. Large deliveries will be scheduled outside peak traffic hours to minimise disruption.

- No daytime or night-time parking of site vehicles or construction staff vehicles will be permitted outside the site gate.

- Any damages to existing roads or footpaths caused during construction will be made good and to the requirements of DLR.

- The contractor shall confine his activities to the area of the site occupied by the works and the builders' compound, as far as practicably possible, during any particular phase of the works.

- Establishment and maintenance of a truck holding area within the site.

- All construction workers will be encouraged to use public transport, and to car share.

<u>Safety on the Public Road:</u>

- Inside the site boundary, all construction vehicles will give way to pedestrians.

- Any works completed outside site boundary will be fully barriered with such work covered by a method statement and agreed in advance with the local authority.

- Flagmen shall be used to control the movement of construction vehicles to and from the site, where required.

- For works outside the boundary which may impede traffic / pedestrians on the public road, a separate traffic management plan will be completed and agreed in advance with the local authority.

- The roads will be monitored throughout the works and a road sweeper will be employed when required for the duration should the roads become dirty. The contractor will liaise with the local authority and all adjoining owners / residents in respect of the timing and movement of the road sweeper activity.

- All deliveries must be notified to the site in advance so that the site will be organised, for the offloading and dictate which crane will be unloading. This is to ensure that delivery trucks, on entering the site, cannot block any of the public roads adjacent to the site. A banksman will be assigned to control all deliveries of required.

- Any works on public roads outside the site will be co-ordinated with Dun Laoghaire Rathdown County Council and the adjoining residents, businesses and relevant stakeholders.

- Secure site hoarding will be employed around any works outside of the site, with controlled access points.

- Firm, level, and well-drained pedestrian walkways will be provided.

- Measures will be implemented to ensure drivers driving out onto public roads can see both ways along the footway before they move on to it.

- Footpaths will not be blocked resulting in pedestrians having to step onto the carriageway during.

11.9 Other Mitigation Measures

11.9.1 The following have been identified for implementation of additional mitigation measures:

- Proposed Site Car Parking
- Car Sharing
- Public Transport
- Walking and Cycling
- Sustainable Construction Practices (Minimising Construction Waste)

Proposed On-Site Car Parking

11.9.2 It is good practice from a sustainable development perspective to apply measures to restrain private car usage. Measures such as parking control are important in encouraging alternative forms of travel to the private car.

(a) It is proposed to provide the required car parking on site for construction staff traveling to the site. These parking spaces will be allocated to particular staff members or car registration numbers.

(b) In addition, there will be no parking permitted by construction staff on the adjoining streets, or at undesignated parking areas within the site. This will be included as part of the construction contract.

11.9.3 These proposed measures will be strictly enforced by site management.

Car-sharing

11.9.4 Car-sharing is particularly relevant for the proposed construction works as there is significant potential for a number of staff to travel to site together in one vehicle.

11.9.5 The use of car-sharing by construction staff travelling to the site by private car will be actively encouraged and promoted on an ongoing basis by site management and the Mobility Manager.

11.9.6 Prior to commencement on site, and on an ongoing basis throughout the works, the Mobility Manager would provide information to staff highlighting the benefits of car sharing and request information from staff in respect of their ability to car share. An initial meeting with possible car sharing partners could then be arranged to discuss arrangements for pick-up and collection, scheduling, contact details and agreeing trial periods.

11.9.7 The Mobility Manager will also evaluate on an ongoing basis the needs of staff and opportunities to reduce car dependency and maximise car sharing.

Public Transport

11.9.8 The proposed development site is strategically located and well served by public transport. All construction staff will be encouraged to use public transport throughout the works. The Mobility Manager will provide details to construction staff of the available public transport facilities serving the site, including Bus and LUAS.

Walking and Cycling

11.9.9 The safe and secure movement of pedestrians and vulnerable road users through the construction site will be of the highest priority during the works. It is proposed to provide showers, lockers and changing facilities on site, which would be important for staff members who walk or cycle to work. Secure cycle parking facilities will also be provided on site. The extent of provision will be actively monitored on an ongoing basis throughout the construction works to ensure adequate provision is available.

Evaluation and Reporting

11.9.10 The functioning of the Construction Stage traffic management plan will be overseen on an ongoing basis during the whole of the construction works to ensure the objectives and targets of the Mobility Management Plan are being met and to identify and implement any required measures to remedy any deficiencies.

11.10 Summary of Construction Traffic and Transport Assessment

11.10.1 The overall level of traffic generated by the construction works will be low. A construction traffic management plan will be implemented to ensure the existing road network continues to operate throughout the construction process.

11.10.2 The construction traffic will not have a negative impact on the local road network and will be directed via designated construction traffic routes with access off Dundrum Road only for construction traffic. The proposed construction phasing and traffic management plan will help minimise the impact on local residents and ensure that the adjoining road network remains operational at all times.

11.10.3 A construction stage MMP will also be prepared and monitored throughout the development to ensure that the construction traffic impact is kept to a minimum and appropriately managed and to ensure that no construction parking will take place on adjacent residential streets.

12 SUMMARY OF RESPONSE TO ABP OPINION AND DLR TRAFFIC FI ISSUES RAISED

12.1 Summary of Response to Items Raised

12.1.1 The following is a summary of the Response to items raised by ABP in their Opinion and to FI Requested in DLR Submission to Board on Roads and Traffic matters.

Table 12.1: Summary of Response to Items Raised by Board and DLR Traffic Department

FI Request Item	FI Request Sub-Item	FI Request Sub-Item Summary Description	ILTP Summary Response
1.	(a)	The provision of a fully operational North-South connectivity route for all-users (including vehicular users) from the proposed development to Larchfield Road. The permeability route shall be designed in accordance with DMURS but shall also include a vehicular access from the site to Larchfield Road via Rosemount Green. The Applicant shall amend their proposed red-line boundary to include all required works and include all required letters of consent.	A north/south vehicular route is not deliverable as part of the SHD application and is address in the report
	(b)	The omission of a one of the two proposed vehicular entrances onto Dundrum Road.	Two vehicular access are required to facilitate access for emergency vehicle and to reduce to overall traffic impact on Dundrum Road.
	(c)	Pedestrian/Cyclist access to the north east of the site (to link to Mulvey Park). This shall be shown on all relevant drawings in detail (plans & elevations) and shall not be gated.	Included and not gated.
	(d)	The provision of a fully operational, deliverable East-West pedestrian/cyclist connectivity route from Dundrum Road to Friarsland Road through the site. The route shall be designed in accordance with DMURS. The Applicant shall amend their proposed red-line boundary to include all required works and include all required letters of consent.	Not possible to deliver as part of SHD application as it is on lands outside the control of the applicant. Also little benefit to providing same as set out earlier in the report.
	(e)	Pedestrian/Cyclist access onto Annaville Grove. This shall be shown on all relevant drawings in detail (plans & elevations) and shall not be gated.	It is not proposed to gate this access and the access route is proposed for taking in charge by DLR.

2.		The Applicant shall submit revised drawings and details which clearly demonstrate the quality and nature of all permeability routes across the site. All drawings should be adequately dimensioned and details to allow a detailed assessment of the proposed design. The provision of legible routes for pedestrian/cyclist users which mitigate potential conflicts should be clearly demonstrated, and due regard shall be given to the NDA's guidance: "Building for Everyone: A Universal Design Approach" for all design and circulation aspects. The revised drawings shall be subject to a required Quality Audit.	Refer to drawings and reports prepared by Reddy A+U and BMCE
3.		The Applicant shall submit detailed boundary treatment drawings (plan & elevation drawings) which clearly demonstrate all proposed access arrangements across the site. The proposed provision of gated access points is not acceptable.	Refer to drawings and reports prepared by Reddy A+U, BMCE and Aecom Landscape Architects.
4.	The Applicant shall submit a revised Traffic Impact Assessment for the proposed development. The Assessment shall address the following issues at a minimum:		
	(a)	Utilise realistic trip generation rates and include supporting information to justify these assumptions.	Included in updated TTA and trips calculations based on person trip rates.
	(b)	Acknowledge and address the potential impact of the low level of parking provision in the context of the absence of parking controls in the local area.	The car parking has been determined having regards to overall policy objective and the Apartment Guidelines. Refer to Section 4.9.2 of the *Statement of Consistency* for further justification in this regard.
	(c)	Demonstrate that due regard has been shown to local planning history for the adjacent lands along Dundrum Road and the surrounding environment. Due regard shall be demonstrated with regard to committed development and cognisance of potential future development along Dundrum Road and the surrounding Roads. Possible impacts to the local road network can be inferred where necessary using required densities and car parking requirements.	This is addressed under cumulative impact in the TTA
5.		The Applicant shall submit detailed drawings which demonstrate any and all areas to be taken in charge by DLRCC. Drawings and details which demonstrate that all development works (i.e. proposed internal access roadway, footpaths, street lighting, etc) to be designed to meet Dun Laoghaire-Rathdown County Council's 'Taking In Charge Policy Document (April 2016)': http://www.dlrcoco.ie/en/planning/building-control/takingcharge and 'Taking in Charge Procedure Document' and all to the satisfaction of the Planning Authority (Municipal Services Department) at the Applicant's own expense.	Refer to BMCE and Reddy Architects Scheme drawings

6.		The Applicant shall submit revised detailed drawings which demonstrate the provision of 1314 car parking spaces to serve the proposed residential aspect of the proposed development. The location and allocation of all parking shall be clearly demonstrated on submitted drawings with all inaccuracies, errors and conflicts rectified. The location of all proposed loading bays shall be clearly demonstrated.	The proposed car parking provision has been revised upwards from original proposals while having regard to national policies and guidelines. Detailed in TTA.
7.		The Applicant shall submit revised drawings and details which demonstrate how privately allocated parking will be controlled within the development and also demonstrate that non-residential car parking shall be clearly designated and segregated from residential allocation in accordance with Section 8.2.4.5 Car Parking Standards of the current DLRCC County Development Plan 2016-2022.	Residential and non-residential car parking car parking is delineated and is shown on the Reddy Architects scheme drawings.
8.		The Applicant shall submit revised drawings and details which clearly demonstrate the provision of motorcycle parking in accordance with Section 8.2.4.8 of the current DLRCC County Development Plan 2016-2022.	Motorcycle parking included in accordance with the DLRCC requirements.
9.		The Applicant shall submit revised drawings and details which clearly demonstrate the provision of parking that is suitable for use by disabled persons in accordance with Section 8.2.4.5 of the current DLRCC County Development Plan 2016-2022.	Disable car parking to DLR requirement included in application.
10.		The Applicant shall submit revised drawings and details which clearly demonstrate the provision of electric vehicle charging points in accordance with Section 8.2.4.12 of the current DLRCC County Development Plan 2016-2022. 1 No. fully operational electric vehicle charging points per 10 No. residential units is required at a minimum. Further provision is welcome. The drawings shall also demonstrate that all proposed car parking spaces shall be designed so as to enable future installation of EV charging points without the requirement for intrusive works.	Included in Reddy Architects drawings.

11.		The Applicant shall submit revised drawings and details which clearly demonstrate the provision of proposed car sharing/car club spaces at the proposed development. A letter of intent from Go-Car to provide this service at the proposed development shall also be submitted.	The LDA are required to tender such service. Car Share facilities will be provided for as part of the overall scheme.
12.		The Applicant shall submit revised drawings and details which clearly demonstrate that the proposed quantity cycle parking provision at the development is in accordance with the DHLG Design Standards for New Apartments - December 2020. The quantity of required "Sheffield" type cycle stands shall be shown to be in accordance with the requirements outlined in DLRCC's Standards for Cycle Parking and associated Cycling Facilities for New Developments - January 2018.Stacked cycle parking is acceptable for the remainder of cycle parking at the proposed development provided that the mix is adequately dispersed across the site, and the location of cycle parking is in accordance with relevant standards/guidance in order to improve access and encourage use. Provision should be demonstrated across the site for bicycle share facilities and cargo bike parking. The Applicant shall also clearly demonstrate numbers of short and long term cycle parking spaces allocated to each block in accordance with the aforementioned standards/guidance.	The cycle parking proposed is in excess of the DLR CDP requirement and in accordance with the Apartment Guidelines.. Provision for a public bike scheme and cargo bike parking is shown in the Reddy Architects scheme drawing.
13.		The Applicant shall submit a detailed Quality Audit (including a Road Safety Audit, Access Audit, Cycle Audit and a Walking Audit) has not been included in the Application. All internal layouts should be designed in accordance with DMURS 2019. The Audit shall examine the most up-to-date layout across the site and address the following non exhaustive list, among all other relevant items:	Included as separate reports
	(a)	The appropriate use of tactile paving in accordance with DMURS and DETR "Guidance on the use of Tactile Paving Surfaces"	These are included in the BMCE designs
	(b)	The provision of shared surfaces with "pedestrian comfort zone" areas resulting in substandard footpath width, perceived vehicular priority, unclear layout for visually impaired users and generally not in accordance with DMURS.	See BMCE layout drawing
	(c)	Provide and clarify provision of legible continuous pedestrian routes free of obstruction and mitigate potential conflict with other users and demonstrate width in accordance DMURS which is appropriate for the level of use.	See BMCE layout drawing
	(d)	Address all potential conflicts arising from interactions between users across the site including external access points.	See BMCE layout drawing

	(e)	Assess the quality of the proposed changes to road markings etc. on Dundrum Road.	See BMCE layout drawing. All access layout and associated road marking will be implemented to the DLR taking in charge requirements
	(f)	Assess the design of the proposed accesses including cross sections elevations etc.	Refer to drawings and reports prepared by Reddy A+U, BMCE and Aecom Landscape Architects.
	(g)	Assess the adequacy of swept path analysis submitted.	Refer to BMCE drawing
	(h)	Assess circulation and permeability across the entire site.	See TTA and DMURS Compatibility Statement and BMCE scheme drawing
	(i)	Assess the arrangement for refuse collection across the entire site.	Refer to BMCE drawing
14.		The Applicant shall clarify the proposed use of the existing Central Mental Hospital Building and ensure that transportation issues in relation to possible land uses are fully identified and addressed. Transportation Planning consider that this part of the site should be included within the red-line boundary.	This will form part of a separate planning application. TTA has included for likely development traffic impacts of these lands.
15.		The Applicant shall submit revised drawings which demonstrate the proposed arrangement for refuse collection across the entire site. The location of waste staging areas and procedure for waste collection shall be clearly demonstrated	Refer to BMCE scheme drawing and Aecom landscape plans
16.		The Applicant shall submit revised drawings which demonstrate swept path analysis for emergency/refuse collection vehicle movements across the site. The drawings shall demonstrate that all conflicts have been addressed, and clearly demonstrate the proposed site/road layout.	Refer to BMCE scheme drawing.

17.		The Applicant shall submit revised drawings which demonstrate the gradient of all proposed access ramps and roads across the site, especially basement access. Due regard shall be given to designing for cyclist access where cycle parking is located within basement areas.	All access gradients in accordance with relevant standards and access ramps to suitable gradients for cyclists. Refer to drawings and reports prepared by Reddy A+U, BMCE and Aecom.
18.		The Applicant shall submit drawings and details which demonstrate all proposed works to Dundrum Road (Single vehicular access with signalised junction, Toucan crossing upgrade and bus stop/shelter relocation). The Applicant shall also submit evidence of written agreement with DLRCC traffic section and the relevant bus service provided for the proposed (required) works.	Also refer to 1(a). Two priority vehicular accesses are proposed off Dundrum Road.. It is not proposed to relocate the existing Bus shelter as part of this application or change the existing Toucan crossing. All works will be undertaken to the Taking in Charge requirement of DLR. Details included in BMCE drawings.

13 SUMMARY & CONCLUSIONS

13.1 Summary Background

13.1.1 ILTP Consulting were commissioned by Reddy Architecture + Urbanism on behalf of the LDA to undertake a Traffic and Transport Assessment (TTA) and Mobility Management Plan (MMP) for the proposed Dundrum Central Development. The proposed development lands are currently occupied by the Central Mental Hospital and these existing services will cease and be replaced elsewhere in the near future. As the overall masterplan lands will use the proposed accesses and local transport networks and the TTA assessments allowed for the full development of the lands.

13.2 Development Proposals

13.2.1 The proposed SHD development comprises a total of 977 residential units which is a reduction from 1,259 residential units included in the pre-planning consultation. Residential car parking has also been increased in a number of blocks and for individual housing units. The overall development also includes for a creche, medical, community facilities and food and non-food retail use to primarily serve the proposed new development, but which will also provide additional facilities for the surrounding communities.

13.2.2 In preparing this Traffic and Transport Assessment ILTP collected traffic count data on the adjoining road network.

13.2.3 ILTP also met with the Transportation Department of DLRCC to discuss the scope of the study and consider the access options as part of the pre-planning process. In addition, ILTP participated in a wide range of community consultations along with other design team members. A further meeting with the NTA and DLRCC took place post the issue of the Board's opinion.

13.2.4 The development site is located off the Dundrum Road and is well served by the existing LUAS stops at Windy Arbour and Dundrum and by a number of local bus services.

13.2.5 The NTA are the body responsible for the development of public transport service within the GDA and are currently reviewing their Transport Strategy for the GDA. Consultation also took place with the NTA to appraise them of the overall development and to ensure that the NTA were aware of the planned development. The proposed development is also located in an established residential area and has access to high employment areas along the LUAS corridor.

13.2.6 The existing LUAS corridor is a high capacity, high frequency sustainable travel mode in close proximity to the proposed developments and has recently undergone significant capacity expansion. The Bus Connects project will also see a change in bus operation city wide over time to provide for increased bus capacity generally and improved connectivity between travel sustainable modes. Therefore, the proposed development is well serviced by the existing high-capacity high frequency public transport services which are set to be further improved on over time.

13.3 Access Strategy Summary

13.3.1 The main transport elements of the proposed development are summarised as follows. A dual access arrangement is proposed for the Dublin Central development off Dundrum Road:

- **Dundrum Road** – Upgrade the existing access to the proposed development.
- **Dundrum Road** – Create an additional access on the southern part of the lands off Dundrum Road.

- **Annaville Park** – Create a pedestrian and cycle link from Annaville Park to the proposed development.

- **Rosemount Green to Green at Mulvey** – it is proposed to create a pedestrian and cycle route through the proposed development, which will provide connectivity to the wider area and to local schools and other services that avoid major trafficked routes. This link will benefit both new and existing residents of the proposed development.

- **Internal Street Layout** – The internal streets have been designed to accord with DMURS requirements.

13.4 Cycle and Car Parking and MMP Initiatives

13.4.1 The overall development provides for reduced car parking, which is consistent with the Apartment Guidelines and wider transport policies that aim to minimise car dependency, particularly in areas well served by public transport. The level of car parking is therefore set at a lower level to the CDP requirements but is sufficient to meet the need of the overall development. High levels of cycle parking are also proposed to meet and promote increased cycling within the development and adjoining areas, through increased cycle and pedestrian permeability provided by the proposed development.

13.4.2 The measures set out in the MMP sections of the report are also intended to support the promotion of sustainable travel patterns and to respond to changes in the travel needs of the new development over time.

13.5 Traffic Impact Assessment

13.5.1 The delivery of higher density development in areas well served by existing public transport is both desirable and necessary. Developments of increased residential density, that provide an appropriate range of supporting development and are well served by existing public transport, can reduce overall traffic on the road network and can also result in reduced travel distances and time spent travelling.

13.5.2 Dublin city centre has seen significant additional development over recent years, but the overall levels of traffic flow have declined steadily over time also. This demonstrates that appropriately located and designed new development can form part of the overall desire to reduce traffic on the street network in urban areas.

13.5.3 Traffic flows along radial routes into the city centre have also shown, if anything, a slight decrease in volumes over recent years as set out in the TTA.

13.5.4 The proposed opening year for the proposed development is 2024 and the design year is 2039. The TTA estimated the likely additional traffic that would be generated by the proposed development. The cumulative traffic impacts of other development in the area were also taken into consideration and included in the traffic assessment undertaken. To undertake the traffic assessment of the proposed development it was assumed that the proposed development would add this additional traffic to the adjacent road network. However, the assessment undertaken included for conservative assumptions as the provision of well-integrated new development also reduce overall travel demand on the network and car travel demand, particularly in urban areas.

13.5.5 Overall plans and policies seek to reduce car dependency and use in urban areas, which aims over time to reduce traffic volumes on our urban roads and streets.

13.5.6 It is assumed that no further growth in background traffic would result along Dundrum Road post 2024, but the traffic levels were assumed to remain at these levels to 2039 the Design Year for the proposed development. It should be noted that if current Government mode share targets are met then reductions in background traffic can be expected in the short to medium term in line with a greater shift to more sustainable modes of transport.

13.5.7 To assess the capacity of the proposed priority access on the surrounding road network a PICADY Traffic Modelling analysis was undertaken for the proposed access on to Dundrum Road. The results show that even with the worst-case Scenario Assumptions the proposed accesses off Dundrum Road operated within capacity and no major delays or traffic queues were shown to result along Dundrum Road as a result of the proposed development.

13.5.8 The twin access approach means that traffic to and from the development is better distributed on to the local road network and not all concentrated at the existing entrance, where large pedestrian and cycle movements are likely to arise. The twin access approach also minimises internal traffic movement. This helps reduce conflict with the large numbers of pedestrian and cycle movements within and through the proposed development.

13.5.9 The recent Luas upgrades and existing bus service means that the proposed development is served by a high capacity and high frequency public transport network. The recent capacity increase to the Luas Green Line and planned future upgrades to both Luas and bus service in the area means that the public transport network is future proofed to serve the proposed development and the wider area.

13.5.10 The removal of portions of the existing high boundary wall, the provision of increased permeability coupled with the new landscape proposals and the range of non-residential elements of the development will make the routes through the new development far more attractive for existing cyclists and walkers in the area. The overall development will also benefit the existing wider community and help promote the greater use of sustainable travel modes in the wider area.

13.5.11 The development will fulfil key sustainable objectives that will:

- Ensure that more people live close to services and public transport
- Promote sustainable transit orientated development
- Provide for a mix of uses to minimise travel distance
- Provide filtered permeability through the development so that people (existing and new) can move about more easily by walk and cycle modes than by car.

13.5.12 The MMP measures will further mitigate the traffic and transport impacts of the proposed development.

13.6 Construction Traffic Management Plan

13.6.1 A CTMP is also included as part of the TTA. This shows a proposed haul route for heavy construction traffic will travel along the Dundrum Road to and from the south.

13.6.2 The proposed haul road will ensure that construction related heavy traffic will not route through residential streets in the area and instead be concentrated along the regional road network to the south that also link with the M50 motorway and national road network. No parking of vehicles by construction staff will be permitted during the construction stage and all construction staff car parking will be provided on site where required.

13.7 Conclusions

The proposed Dundrum Central development fully accords with the policies at national and regional level and also has regard to the overall transport policies as set out in *Dun Laoghaire Rathdown County Development Plan 2016 – 2022* and the principles on cycle and car parking provision as set out in the relevant national Guidelines. The proposed development is fully supported by National, Regional and Local policies and is designed in a manner so that it also promotes the principles underpinning sustainable transport and development.

A APPENDIX A

A.1 Traffic Survey Results

B APPENDIX B

B.1 TRICS Outputs

C APPENDIX C

C.1 PICADY and LinSig Outputs