

12. MATERIAL ASSET: TRAFFIC & TRANSPORT

12.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) presents the proposed transport strategy and associated transport impact for the UCD Student Residences Masterplan at the UCD Belfield Campus, Dublin 4. The proposed development will be located at the southwest of the campus core and comprise of 3,006 bedspaces arranged in a series of 6 Blocks which vary in height from 5 to 10 storeys, along with ancillary facilities such as activity hubs and a student facility centre ('the Fulcrum Building').

The proposed development adheres to UCD's Travel Plan 2016-2021-2026 aim to balance the amount of car parking in each cell; increase the quantum of managed visitor spaces within UCD; provide a limited number of dedicated spaces for student residence within UCD and maintain existing quantum of permit parking. The total number of car parking spaces throughout the UCD campus is within the targeted maximum number of spaces set out in the travel plan to 2026 which assumes that external transport improvements are achieved.

Bicycle parking both long and short stay is provided within the development as per Dun Laoghaire Rathdown County Council standards.

The development incorporated the campus commuting principles set out in the UCD Travel Plan 2016-2021-2026 through its enhancement of shared spaces to accommodate pedestrians and cyclists with service vehicles as guests in the space and developing the principle of keeping vehicular activity to the periphery of the campus.

The proposed development also includes 994 new car parking spaces, including a basement level car park, two surface car parks and disabled bays. Approximately 679 spaces will be displaced due to the development, with an additional 305 spaces to be decommissioned across campus in the longer term, subject to achieving the targets proposed in the draft UCD Travel Plan. Approximately 2,104 cycle parking spaces will also be provided as part of the Masterplan.

The full detail of the nature and extent of the proposed development is set out in Chapter 3 of this EIAR 'Description of Development'.

12.1.1 Transport Planning Policy Context

As the largest 3rd level Education Institution in the State and thereby one of the largest activity attractors and generators, UCD plays an important role in employment creation at both regional and national levels and, in particular, hugely contributes to the economic development and investment attractiveness of both Dun Laoghaire–Rathdown County Council (DLRCC) and the Greater Dublin Area (GDA) overall.

As a University Community, the equivalent of Kilkenny City in south Dublin, Belfield generates significant transport demand, which is recognised by the key operational role the campus plays in the public transport network of the GDA, providing a terminus for both public and private services. There are approximately 50 buses entering and exiting the campus per hour at peak times with other busy bus routes on the N11 corridor, such as the 46A stopping outside of the campus.

Transport planning for the campus at a strategic level is therefore both influenced and recognised by policy objectives at national, regional and local level. These objectives are set out in the following section.

12.1.2 National Policy

Smarter Travel: A Sustainable Transport Future – This national policy document which covers a period from 2009-2020 sets out 49 actions which aim to *‘reverse the current unsustainable transport and travel patterns and reduce the health and environmental impacts of current trends and improve our quality of life’*. Implementation of Smarter Travel can be summarised into four overarching actions:

- Actions to reduce 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 to deliver the targets.

National Cycle Policy Framework – this national policy sets out specific objectives along with individual, integrated actions aimed at ensuring that a cycling culture is developed in Ireland. *‘The vision is that all cities, towns, villages and rural areas will be bicycle friendly. Cycling will be a normal way to get about, especially for short trips’*.

Cycling contributes to improved quality of life and quality of the public realm, a stronger economy and business environment, and an enhanced environment. The policy framework looks to develop a culture of cycling in Ireland to the extent that by 2020, 10% of all trips will be by bike.

UCD has responded proactively to this policy objective in recent years, with 20% of trips to campus made by bike, equating to over 7,000 cycle trips per day into and out of Belfield.

12.1.3 Regional Policy

Regional Planning Guidelines for the Greater Dublin Area 2010-2022

The Regional Planning Guidelines (RPGs) for the Greater Dublin Area provides guidance on the future growth of the Region over the medium to long term. As such the RPGs inform and direct the City and County Development Plans of each of the Councils in the Greater Dublin Area.

The vision for the Region is that:

‘The GDA by 2022 is an economically vibrant, active and sustainable international Gateway Region, with strong connectivity across the GDA Region, nationally and worldwide; a region which fosters communities living in attractive, accessible places well supported by community infrastructure and enjoying high quality leisure facilities; and promotes and protects across the GDA green corridors, active agricultural lands and protected natural areas’.

The RPGs also set out the need to implement land use policies that support and protect the investments currently being made in public transport to ensure that the maximum benefit is gained economically, socially, environmentally and in relation to overall health.

Greater Dublin Area Transport Strategy 2016-2035

This Strategy provides a framework for the planning and delivery of transport infrastructure and services in the GDA over the next two decades. It also provides a transport planning policy around which other agencies involved in land use planning, environmental protection, and delivery of other infrastructure such as housing, water and power, can align their investment priorities.

The Strategy has identified a number of regional trends which have been taken into account when formulating longer term planning for the Dublin Region, including:

- Suburbanisation and spread of population, employment and other land uses has continued which has also led to increased mode share of car use;
- Arising from the above trend, the mode share of car use continues to increase;
- Car ownership is likely to increase further;
- Cycling has increased significantly in numbers and in mode share; and
- Encouraging non-car use for trips to education is a significant challenge.

Within the life of the Strategy, significant improvements are proposed to heavy and light rail infrastructure, bus infrastructure, and the walking and cycling network within the GDA.

Externally, UCD will benefit in general from a wider, more integrated public transport network across the GDA. Specific transport projects set out in the Strategy that will directly benefit UCD include:

- The Blanchardstown to UCD 'Swiftway' Bus Rapid Transit (BRT) scheme;
- The Dundrum/UCD to Tallaght orbital bus route; and
- Improvements to the Bray/N11 – UCD – Donnybrook radial bus route.

Greater Dublin Area Cycle Network Plan

This Plan has been prepared by the NTA setting out a network of urban, inter-urban and green cycle routes within the GDA which is consistent across county boundaries and allows for a continuity of route networks.

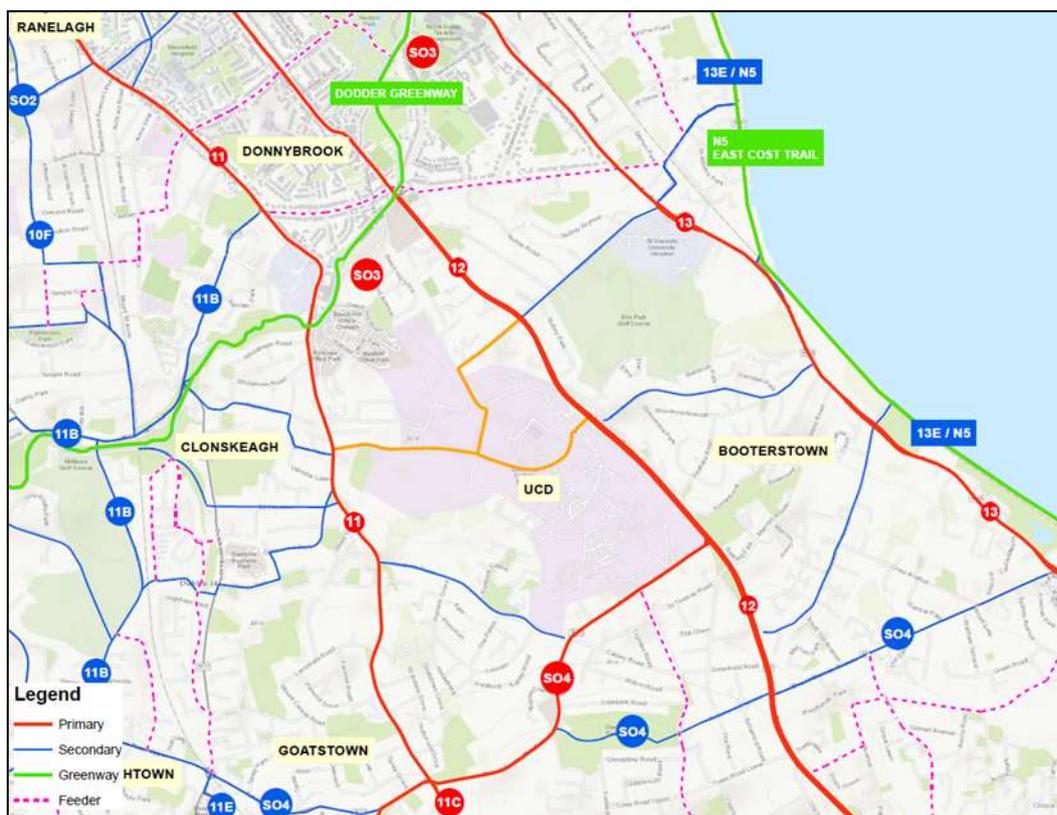
Routes identified within the vicinity of the campus are shown in Figure 12.1 and include:

- **SO3** - this is an orbital greenway route along the River Dodder which will connect Grand Canal Dock in Dublin City Centre with Tallaght. It is proposed to route along Beaver Row which would be the nearest connection to the campus;
- **SO4** - this orbital route will connect Blackrock to Chapelizod, via Goatstown, Rathfarnham and Walkinstown. A feeder route from this has been identified as a connection to the southern end of the campus;

- **Route 11** – this primary radial route will connect the City Centre with Sandyford via Ranleigh Road, Clonskeagh Road and Goatstown Cross. This route will directly pass the entrances to UCD along the western boundary of the campus. A number of branches to this route have also been identified in the Plan; and
- **Route 12** - this primary radial route will connect College Green with Bray via Leeson Street and Stillorgan Road. This route will directly pass the entrances to campus along the R138 (Stillorgan Road) as well as being convenient for accessing the Greenfield Park entrance.

The Plan has also identified cycle routes through the campus that will help to integrate the cycle network. Specifically, it would connect Routes 11 and 12 as well as the secondary route identified along Nutley Lane.

Figure 12.1 Routes Identified in GDA Cycle Network Plan



12.1.4 Local Policy

Dun Laoghaire - Rathdown County Council Development Plan 2016-2022

The DLRCC Development Plan sets out a series of policies for the continuing sustainable development of the County for the period 2016 to 2022. UCD is the largest single employer in the County and as such plays an important role in its economic development. The Plan recognises that this, along with UCD's activities in relation to education, research and development which increase the attractiveness of the County for investment.

The Development Plan sets the following specific local objectives in relation to UCD:

No. 1: 'To facilitate, support and enhance the development of University College Dublin including all associated and supporting facilities. A range of uses will be facilitated on Belfield campus lands to encourage and foster strong links between education, community and the business sector in the County.'

No.6: 'To promote potential additional future uses of the Dublin Eastern Bypass reservation corridor, including a greenway/cycleway, a pedestrian walkway, biodiversity projects, recreational opportunities – inclusive of playing pitches - and public transport provision such as Bus Rapid Transit services, pending a decision from Transport Infrastructure Ireland/Central Government in relation to the future status of the Bypass. Any potential additional future short-term uses of the reservation corridor will be subject to a joint feasibility study to be undertaken by TII and the NTA.'

No. 148: 'To identify and address the on-going car parking issues within and surrounding UCD Campus. In particular, the Council will support and facilitate the on-going process of Mobility Management Planning for UCD, involving the University and the NTA, in order to achieve more sustainable travel patterns to and from the University and to work towards the development of a Campus Travel Plan.'

12.1.5 UCD Sustainable Transport Strategy

Sustainable Commuting and Mobility Planning are cornerstones of the UCD Strategic Campus Development Plan 2016-2021-2026. Since 2011, UCD, the National Transport Authority (NTA) and Dun Laoghaire Rathdown County Council (DLRCC) have been working together through the UCD Commuting Review Group to both improve and promote sustainable transport and to reduce the modal split away from private car usage and the need for car parking.

As part of the UCD's Travel Plan 2016-2021-2026, and associated document *"Getting There the Sustainable Way"*, UCD has also agreed to limit the campus-wide car parking provision to a sustainable limit that takes account of the availability of alternative travel choices, while at the same time working to consolidate car parking facilities and continue to introduce car parking demand management measures.

A key target of the UCD Travel Plan 2016-2021-2026 is to improve the sustainable mode share from 77% to 81% by 2026. This is guided by three core principles:

1. Promoting Sustainable Travel Options;
2. Encouraging Activity, Health and Wellbeing; and
3. Developing an Accessible, Attractive and Welcoming Campus.

The main objectives with regard to the car parking strategy for the overall campus are:

- To continue to manage car parking demand and levels of parking provision at a campus level;
- To provide a limited number of managed, dedicated, long-term 'car-storage' parking spaces for student residents on-campus;
- To increase the quantum of managed (i.e. pay and display) visitor parking in each traffic cell (total of approx. 150 spaces across campus) to address existing parking demand issues; and
- To accommodate planned increases in campus population while maintaining the number of parking spaces with a 'commuting impact' at existing levels or reduce where possible, so as not to impact on the surrounding road network.

It is proposed within the plan that existing surface car parks located within the heart of the campus are to be replaced with a smaller number of managed car parks located at its as part of the College's holistic approach to car parking and the enhancement of the campus' core as a high-quality pedestrian zone.

The UCD Travel Plan sets a maximum car parking provision of 3,568 spaces across the campus by 2026. This maximum assumes the implementation of external transport schemes that will provide real alternatives to the private car for commuting to and from UCD.

Traffic Cells

The system of traffic cells enables an improved pedestrian environment within the core of the campus and is seen as independent from specific buildings and/or College functions. UCD has agreed with DLRCC and the NTA, through the Commuting Review process, that car parking should be managed holistically across the whole campus to allow for a better management of impacts on the capacity of adjacent roads and the mitigation of car parking overspill onto neighbouring residential areas.

The traffic cells are present below in Figure 12.2. The presence of barriers prevents the movement of traffic through UCD during peak times, therefore controlling the use of car parking throughout the campus. By monitoring the number of cars entering and exiting each cell through the UCD Cordon Count surveys the required demand and associated provision can be managed.

Figure 12.2 UCD Traffic Cells



12.2 Stakeholder Consultation

Consultations have taken place with key stakeholders regarding the UCD Student Residents Masterplan as well as the development of an integrated Travel Plan for the Belfield campus.

In addition to the project specific consultations, a steering group made up of UCD, the NTA and DLRCC (the 'UCD Commuting Review Group') meet quarterly to provide a forum for discussion and resolution of all matters relating to transport that affect UCD.

The content of the project specific consultations is summarised below.

12.2.1 Dun Laoghaire Rathdown County Council

The design and client team met with DLRCC on August 31st 2016 to present scheme proposals regarding the UCD Student Residences Masterplan, including car parking and access proposals. No specific traffic and transport issues were raised at the time of the consultation.

12.2.2 National Transport Authority

UCD met with the National Transport Authority (NTA) on October 6th 2016 to discuss the draft UCD Travel Plan 2016-2021-2026 as well as to present the proposals for the UCD Student Residences Masterplan.

The NTA were supportive of the UCD Student Residences Masterplan proposals and agreed in principle with the UCD Travel Plan 2016-2021-2026, including the target travel modal splits and the quantum of and management of car parking. The role that the NTA will play in ensuring the delivery of improvements to public transport and cycling infrastructure external to the campus was also acknowledged.

12.3 Appraisal Methodology

This section presents the methodology for the traffic and transportation appraisal associated with the UCD Student Residences Masterplan. The subsequent sections of this EiAR chapter consider the following:

- Review of pedestrian, cycling and public transport accessibility to UCD;
 - Existing road network and traffic conditions in the vicinity of UCD;
 - Existing travel patterns to UCD;
 - Characteristics of the proposed development in terms of traffic and transportation, (including access, circulation and facilities for pedestrians, cyclists, vehicular traffic, emergency vehicles and servicing);
 - Appraisal of the transport impact during both the construction and operational phases; and
 - Mitigation measures.
- 12.4 Receiving Environment

12.4.1 Site Location

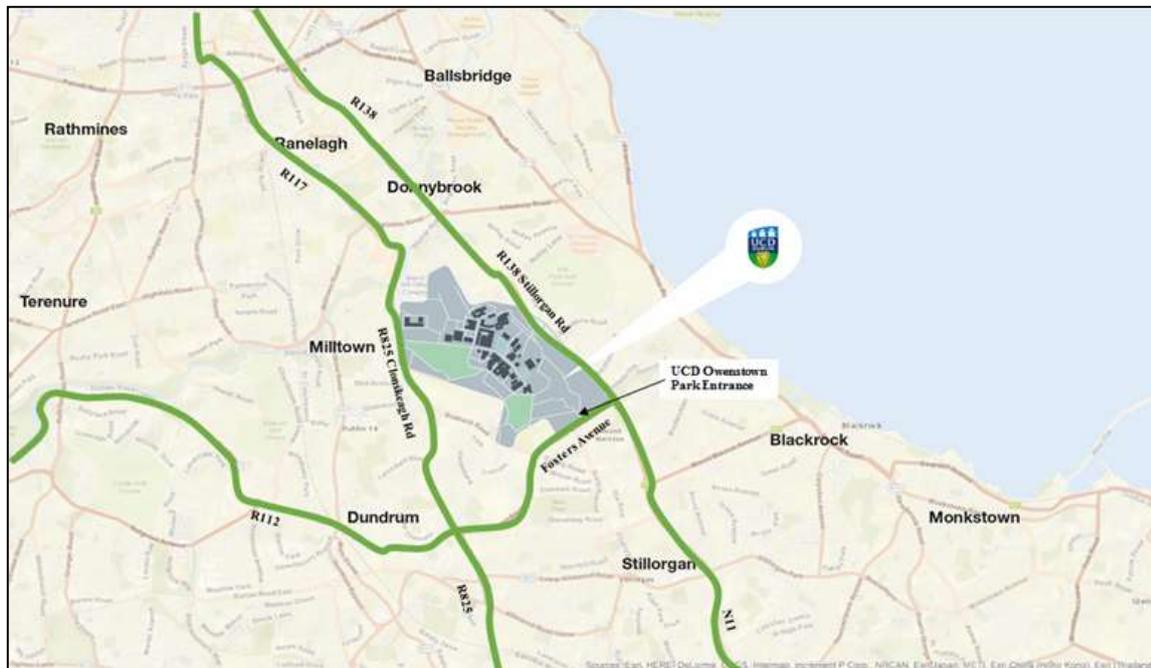
The UCD Belfield campus is located south east of Dublin City Centre, approximately 4km from St. Stephen's Green. The location of the campus in its regional context is shown in Figure 12.3.

Figure 12.3 UCD Campus in its Regional Context



The UCD campus is bounded by the R138 Stillorgan Road to the north-east, by Foster’s Avenue to the south-east, by Roebuck Road to the south and the south-east and by Clonskeagh Road to the west. The location of the campus in its local context is shown in Figure 12.4.

Figure 12.4 UCD Campus in its Local Context



Within the campus, the lands that will be developed as part of the UCD Student Residences Masterplan are located to the south-western end of the campus, bounded by the internal ring road to the north, existing

student residences to north-west, south and east and the Roebuck Castle residential estate to the west. The location of these lands are presented in Figure 12.5.

Figure 12.5 UCD Student Residences Masterplan Lands



12.4.2 Existing Pedestrian Network

The accessibility of the campus within 10, 20 and 30 minutes by foot from the campus entrances is shown in Figure 12.6. A walk time of 45 minutes is generally considered to be the upper limit for commuting purposes, with the 2015/16 travel survey showing that the majority of students (84%) and staff (63%) who walk, have journey times of 30 minutes or less.

The 10-minute walk catchment extends to the surrounding residential areas and incorporates key bus stops along the R138 Stillorgan Road and Clonskeagh Road. Areas within 20 minute walk include Donnybrook and St. Vincent's Hospital while the nearest Luas and DART stops are just outside of this catchment. The 30-minute walk catchment extends to Ranelagh, Ballsbridge, Milltown, Stillorgan and the Merrion Road QBC.

The Belfield campus has a permeable pedestrian network that is connected to the external network at multiple locations, thereby creating a relatively permeable campus. In total, there are currently 12 formal entrances for pedestrians into the campus, with an additional informal entrance used by pedestrians adjacent to the Stillorgan Road footbridge near UCD Nova.

Within the campus, the pedestrian network is of a high quality with wide, well-lit and well-maintained footpaths connecting the entrances with the university academic buildings, facilities and residences. There are over eight kilometres of walking, jogging and cross-country woodland paths on campus providing an attractive facility for both the UCD population as well as the local community.

Figure 12.6 UCD Walk Catchment



12.4.3 Existing Cycle Network

There has been significant investment by both the NTA, DLRCC and UCD in cycling, both on campus and in the surrounding areas in terms of cycle infrastructure and provision of end of trip facilities such as cycle parking, showers and lockers.

The cycle catchment of the campus (as presented in Figure 12.7) is significant, with the 30-minute catchment extending as far as the Drumcondra to the north, Walkinstown and Knocklyon to the west, Stepside to the south and Dun Laoghaire to the south-east. Other areas within the 30-minute catchment include Ballsbridge, Sandyford and Dundrum as well as a number of Luas and DART stations.

A cycle time of 45mins is generally considered to be the upper limit for commuting purposes, with the latest travel survey showing that the majority of students (85%) and staff (76%) who cycle, have journey times of 30 minutes or less.

Cycling facilities within the vicinity of the campus include cycle tracks along the Stillorgan Road and cycle lanes along Roebuck Road and Clonskeagh Road (a section of which has recently been upgraded). The quality of these facilities vary however, with significant investment planned as set out in the GDA Cycle Network Plan.

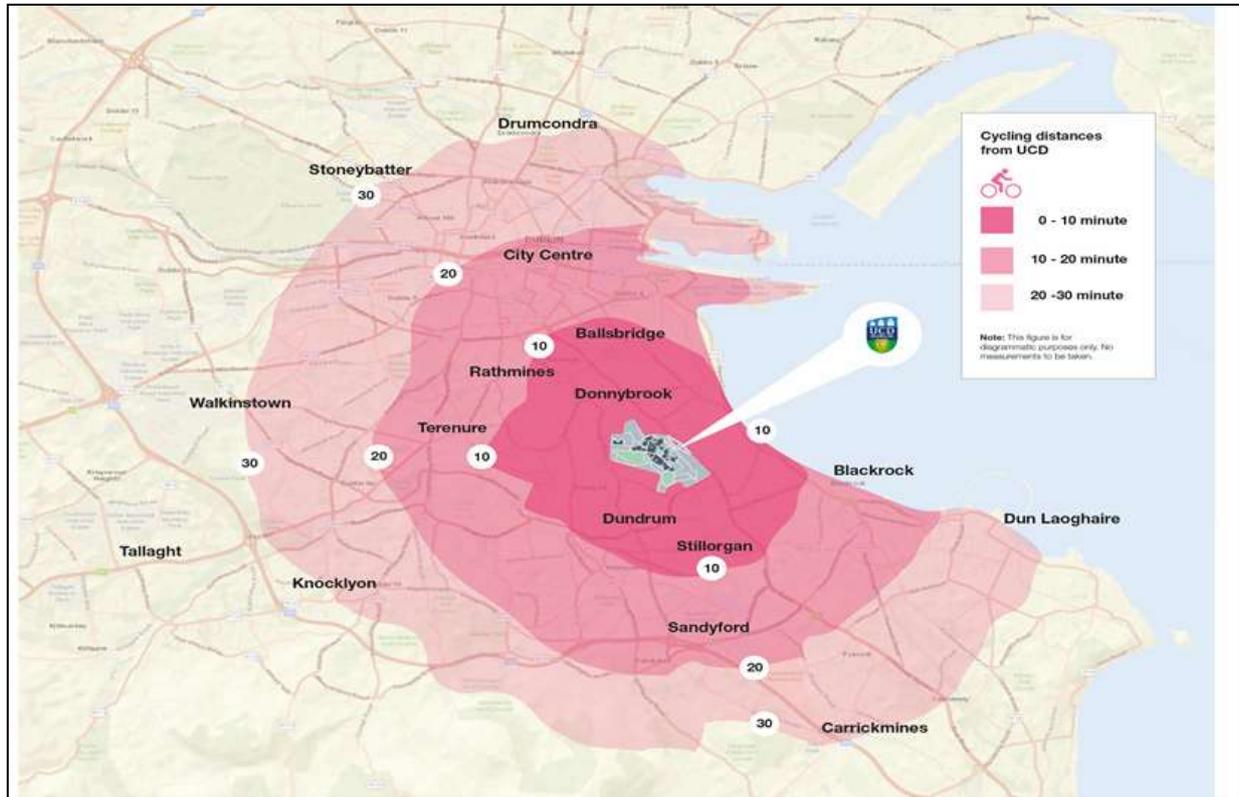
Within the campus, there is a limited amount of dedicated cycle routes, and in general, cyclists share traffic calmed roads with vehicles along the periphery or share routes with pedestrians within the central core area.

There is currently approximately 4,100 formal cycle parking spaces on campus, consisting of a mix of lockers, stands and wheel racks. Significant investment, with funding support from the NTA has occurred over the

last 5 years in the replacement of old cycle parking stands on campus. Most parking is provided around the Science, Newman Joyce and Health and Agriculture Precincts.

Cycle spaces are now generally provided in well-lit, active areas that provide passive surveillance and easy access to relevant entrances of buildings.

Figure 12.7 UCD Cycle Catchment



12.4.4 Existing Public Transport Network

In recent years, UCD with support from the NTA, has invested in public transport facilities and services on campus, including the construction of a new bus terminus and bus gate, and the provision of a shuttle bus service to the DART and trials to other locations such as Tallaght.

Figure 12.8 UCD Bus Terminus



Figure 12.9 UCD DART Shuttle Bus



UCD in collaboration with the NTA and Dublin Bus run awareness campaigns to promote the use of travel by public transport, with staff also able to avail of the TaxSaver ticketing scheme through UCD.

The Belfield campus is directly served by a number of bus routes (both public and private services), with the nearest Luas and DART stations about a 20 minute walk from the campus. The main mode of public transport used by the UCD population is bus, accounting for 38% of student trips and 17% of staff trips while rail based modes (i.e. Train, DART and Luas) account for 6% and 4% of student and staff commuting trips respectively.

The journey time accessibility of the campus by public transport is shown in Figure 12.10, illustrating the significant potential and importance of buses to meeting the travel demand generated by the campus population. While the 60-minute catchment extends to areas such as Swords to the north, Leixlip and Celbridge to the west and Greystones to the south, the accessibility of many of these areas however are limited by low or peak hour frequency services (e.g. the Dublin Bus 'X' services).

The vast majority of the UCD population that commute by public transport have a commute time of over 30 minutes, with a considerable amount of journeys being over 60 minutes (43% of students and 29% of staff). This is reflective of a continuing trend of people moving away from the city centre, primarily linked to housing and rent affordability.

The three most popular bus routes are the 46a, 145 and 39a with each of the routes having a 10 minute frequency throughout the day, providing a reliable service between UCD and the City Centre. The 46a and 145 also provide connections with areas to the south of the campus such as Dun Laoghaire and Bray.

There remains, however, areas of Dublin which are not directly connected to the campus by public transport, in particular areas of West and North Dublin. Access from these areas is reliant on interchanging in the City Centre such as from Tallaght, Clondalkin, and Ballymun. The introduction of orbital routes, as proposed by the NTA, will help to address some of these issues.

The bus network directly serving UCD is presented in Figure 12.11.

Figure 12.10 UCD Public Transport Catchment

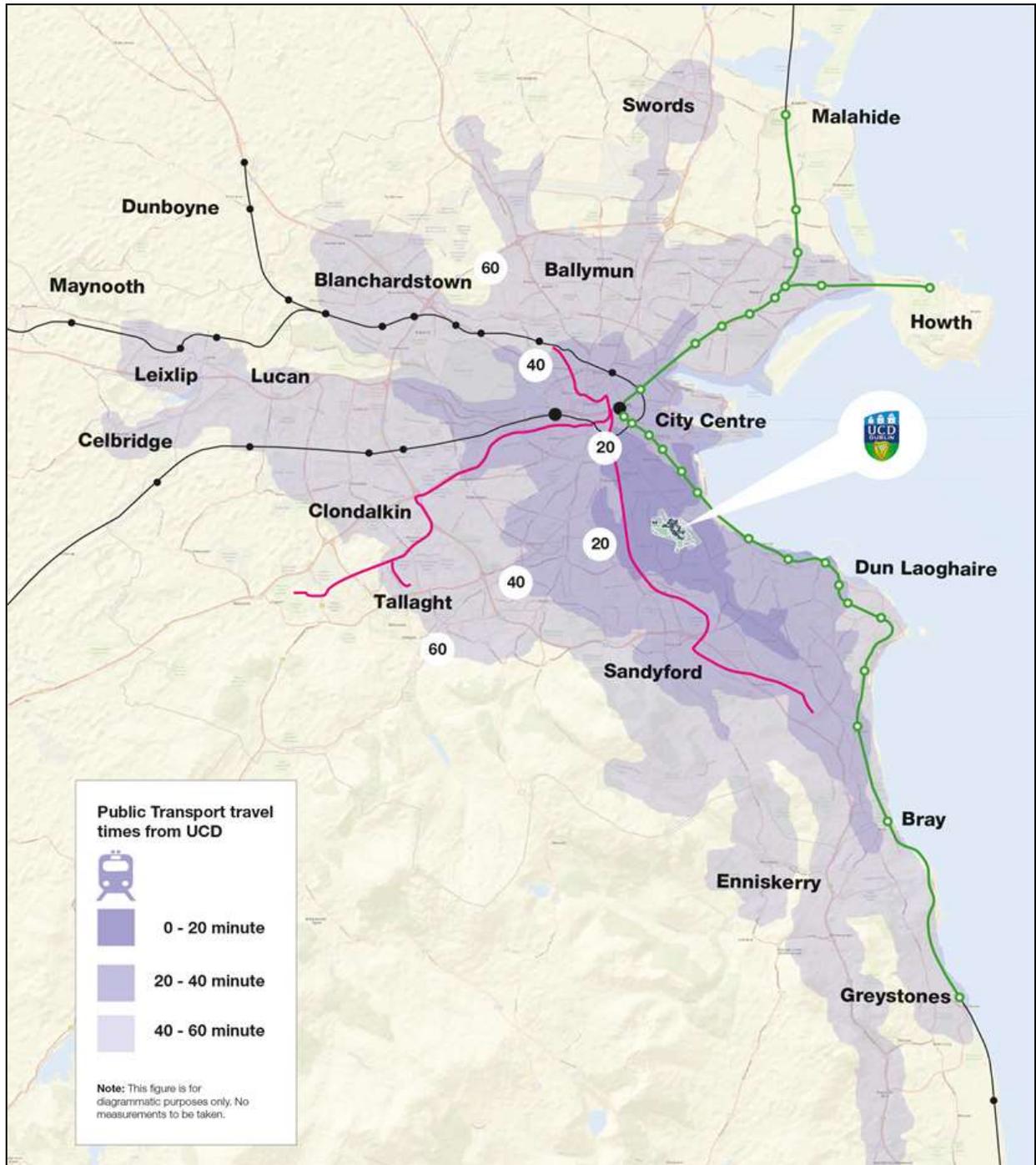
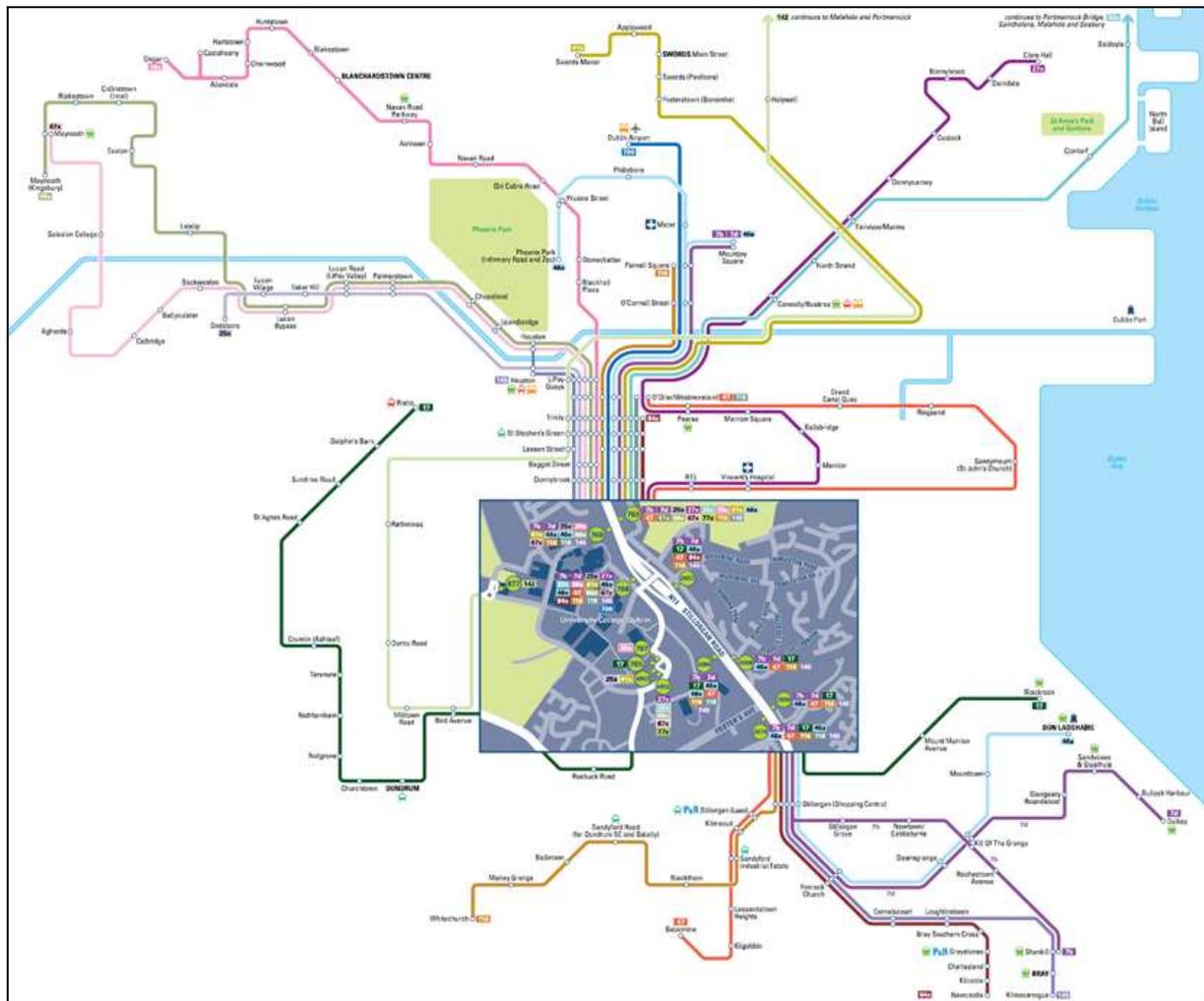


Figure 12.11 UCD Bus Network



12.4.5 Existing Road Network

The existing road network in the vicinity of UCD campus is comprised of regional and local roads (as shown previously in Figure 12.4). The R138 Stillorgan Road (formerly N11) and the R825 Clonskeagh Road are important radial routes between the City Centre and south Dublin (with the Stillorgan Road connecting into the national road network).

The R112 Fosters Avenue is an important orbital link (providing a connection between the R138 Stillorgan Road and the R825 Clonskeagh Road) while also providing access to the Owenstown Park and UCD Nova entrances of the UCD campus. These roads are described below:

12.4.5.1 R138 Stillorgan Road

The R138 Stillorgan Road (becoming the N11 further south) is a north-south, dual carriageway, radial route in south Dublin. It is one of the key radial traffic routes between Dublin City and the national road network. In general, there are two traffic lanes and one bus lane running in each direction along the route, with additional lanes provided for turning movements on the approach to certain junctions.

The Stillorgan Road UCD interchange provides access to the campus as well as to the residential areas of Trimleston and Woodbine to the east. The Stillorgan Road entrance to the campus entrance is a signalised junction with pedestrian crossing facilities in place.

12.4.5.2 R825 Clonskeagh Road

The R825 Clonskeagh Road is a north-south radial route in south Dublin, running between Sandyford and Ranelagh. The carriageway in the vicinity of UCD campus is generally a single lane in each direction, with additional lanes for turning movements provided on approach to junctions.

There are three entrances to UCD off this road, with a signalised junction at Wynnsward Drive and priority junctions at the Newstead and Richview entrances.

12.4.5.3 R112 Fosters Avenue

The R112 is an east-west orbital route in south Dublin, running between the R138 Stillorgan Road (in the east) and Chapelizod (in the west), with Fosters Avenue at the eastern end of the route. The carriageway is generally a single lane in each direction, with additional lanes for turning movements provided on approach to junctions.

The key junctions along this road are with Roebuck Road, Owenstown Park (UCD entrance), North Avenue and the R138 Stillorgan Road. Each of the junctions are signalised, apart from Owenstown Park.

12.4.6 Existing Traffic Volumes and Profiles

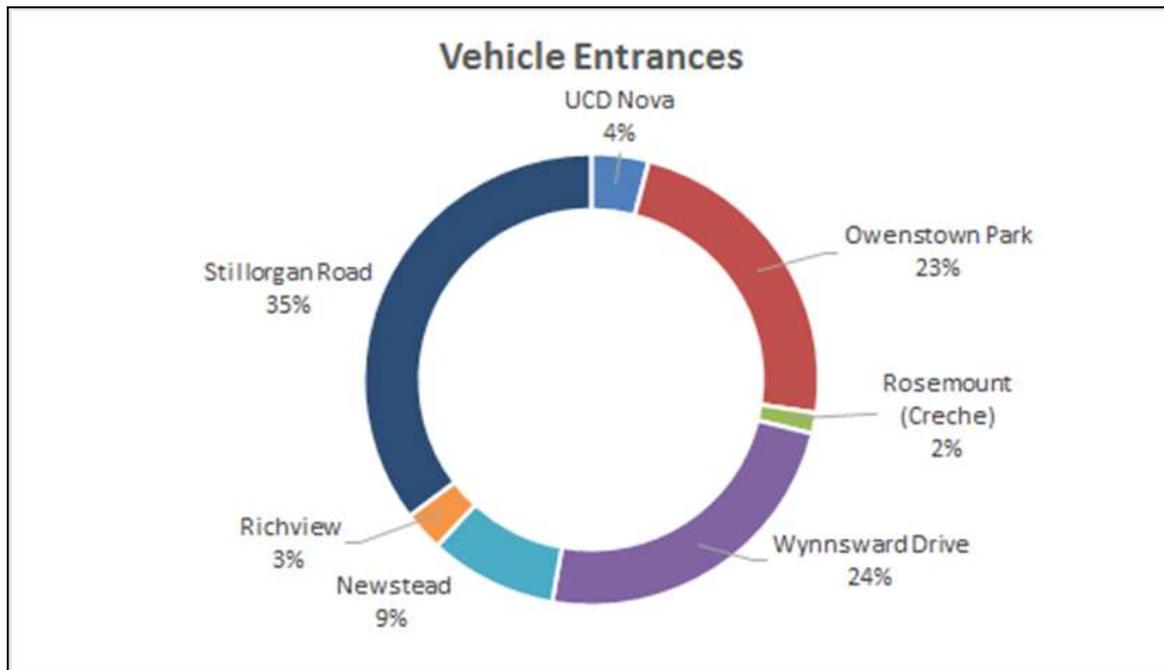
A suite of traffic surveys were carried out in October 2015 over a 12-hour period at each of the UCD entrances and nearby junctions, counting all pedestrians, cyclists and vehicles entering and exiting the campus.

A summary of the findings for the campus as a whole is presented, along with the Owenstown Park entrance which will be most impacted as a result of the UCD Student Residences Masterplan.

12.4.6.1 Vehicle Traffic Volumes

There are seven vehicular entrances into the campus, with the Stillorgan Road entrance also having a northbound only exit approximately 75m north of the main gate. The usage of these entrances by all vehicles (including buses, taxis etc.) is presented in Figure 12.12.

Figure 12.12 Entrance Usage by All Vehicles

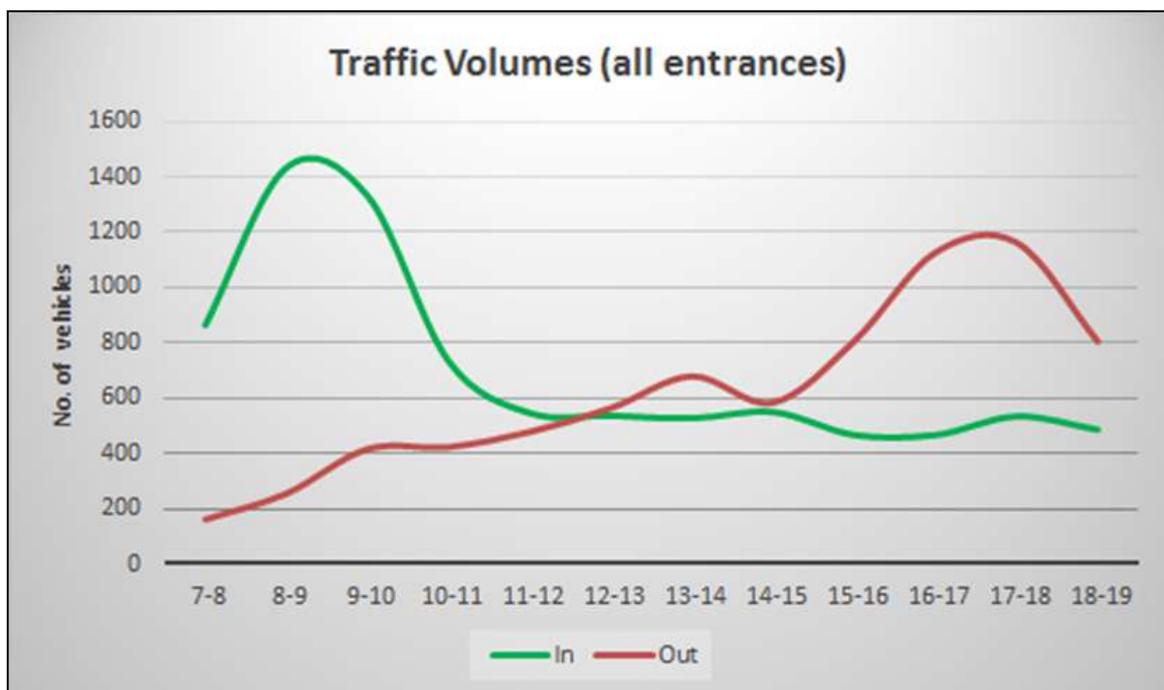


The Stillorgan Road entrance is the busiest in terms of vehicle movements, with 35% of all vehicles using this entrance. The majority of bus movements into and out of the campus occur at this entrance.

Wynnsward Drive and Owenstown Park account for 24% and 23% of vehicle movements respectively, with the other entrances accounting for 18% of all vehicle movements.

The 12-hour profile of vehicle movements into and out of the campus is presented in Figure 12.13.

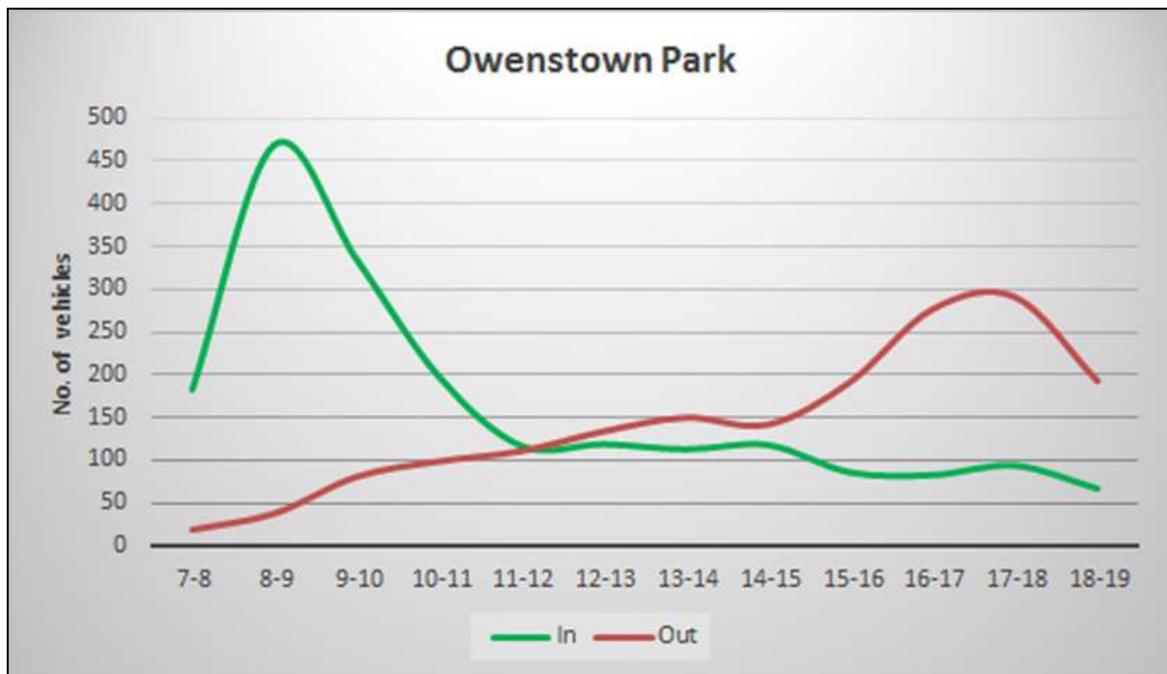
Figure 12.13 Private Car Entry and Exit Profile (All Entrances)



The vehicle movement profile shows a peak of just over 1,400 vehicles entering the campus between 08:00 and 09:00 and a peak of just under 1,200 vehicles exiting the campus between 17:00 and 18:00.

Focussing on the Owenstown Park entrance, there is an entry peak of 469 vehicles between 08:00 and 09:00, and an exit peak of 291 vehicles between 17:00 and 18:00 as presented in Figure 12.14. This entrance is also used by the No. 17 Dublin Bus service.

Figure 12.14 Owenstown Park Vehicle Entry and Exit Profile

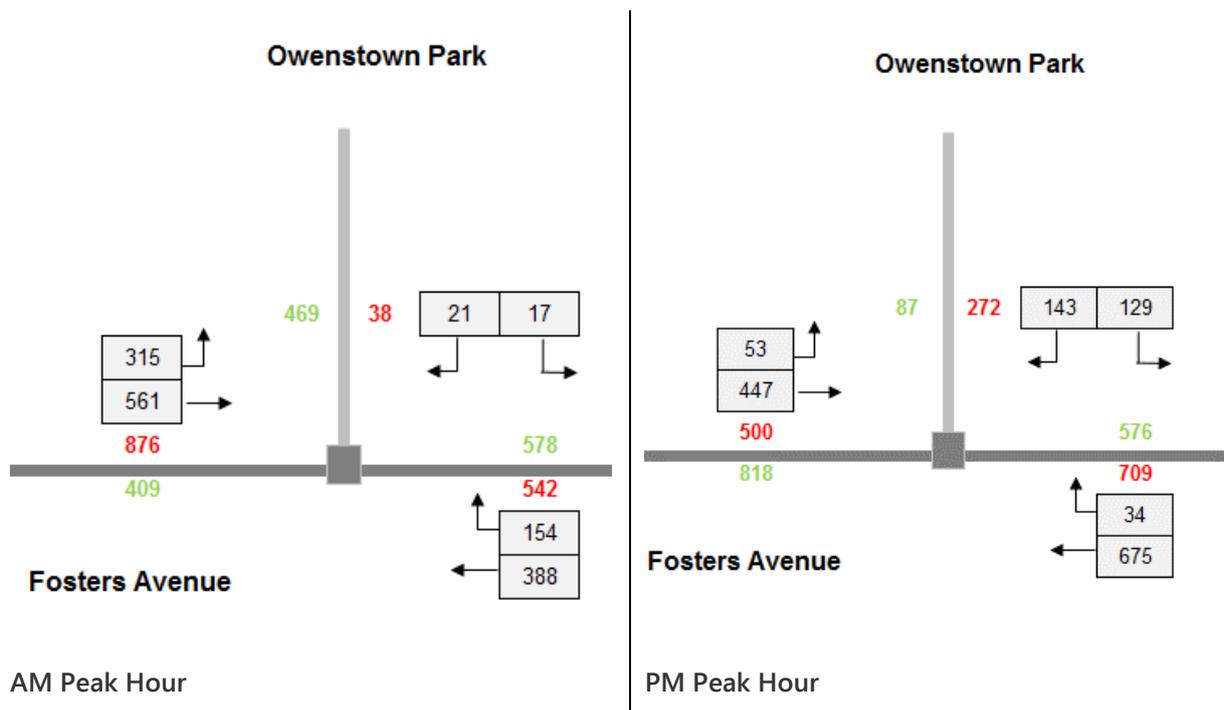


The existing peak hour traffic volumes at the Owenstown Park/Fosters Avenue junction are presented in Figure 12.15. The distribution of vehicle trips entering and exiting the campus at this junction change according to the peak hour period.

During the AM peak, approximately two-thirds of vehicles enter from the west and one-third enter from the east. Conversely, during the PM peak the distribution of vehicles exiting the campus is relatively evenly split between eastbound and westbound movements. Along Fosters Avenue, the main traffic movement is eastbound during the morning peak and westbound during the evening peak.

There are no significant capacity issues at this junction during the peak periods, with short queues occasionally forming due to vehicles turning right from Fosters Avenue into Owenstown Park.

Figure 12.15 Owenstown Park/Fosters Avenue Traffic Movements



12.4.7 Existing Car Parking

In September 2015, UCD introduced parking demand management across its Belfield campus to ensure spaces are only being used by staff, students and visitors associated with UCD. As of September 2016, there are in total 3,558 car parking spaces on campus as presented in Table 12.1.

Table 12.1 Existing Campus Parking Provision

Space Type	Parking Cell						Total
	R138	Owenstown	Richview	Clonskeagh	Nova	Rosemount	
Permit	936	957	129	778	109	25	2,934
E-car	2	0	0	0	0	0	2
Disabled	25	41	4	31	1	4	106
Total Commuting	963	998	133	809	110	29	3,042
Go-Car	3	0	0	0	0	0	3
Restricted	23	7	1	19	0	0	50
SLLS	27	0	0	106	0	0	133
Total Non-Commuting	53	7	1	125	0	0	186
Pay&Display	60	72	11	149	10	0	302
Pay&Display Premium	10	4	3	7	4	0	28
Total Visitor	70	76	14	156	14	0	330
Overall Total	1,086	1,081	148	1,090	124	29	3,558

The largest traffic cells are R138, Owenstown and Clonskeagh. Within the campus, there are 3,042 commuting spaces of which 106 are disabled spaces and 330 are visitor spaces. There are no dedicated student resident 'car storage' spaces.

Not all of the spaces presented in Table 12.1 have a daily 'commuting impact' during peak times with a reduced number of spaces available for the following reasons:

- 133 Student Learning Leisure and Sport Facility (SLLS) car parking spaces are for its private members and are typically used outside of peak times;
- 53 spaces are restricted (e.g. for campus vehicles, the Veterinary Hospital, GoCar);
- 330 visitor spaces that are intended for public use throughout the day.

Taking the above into account, it is therefore estimated that approximately 3,042 spaces on campus have a daily 'commuting impact', which includes 106 no. disabled spaces which tend to have lower occupancy levels.

12.4.8 Travel Patterns

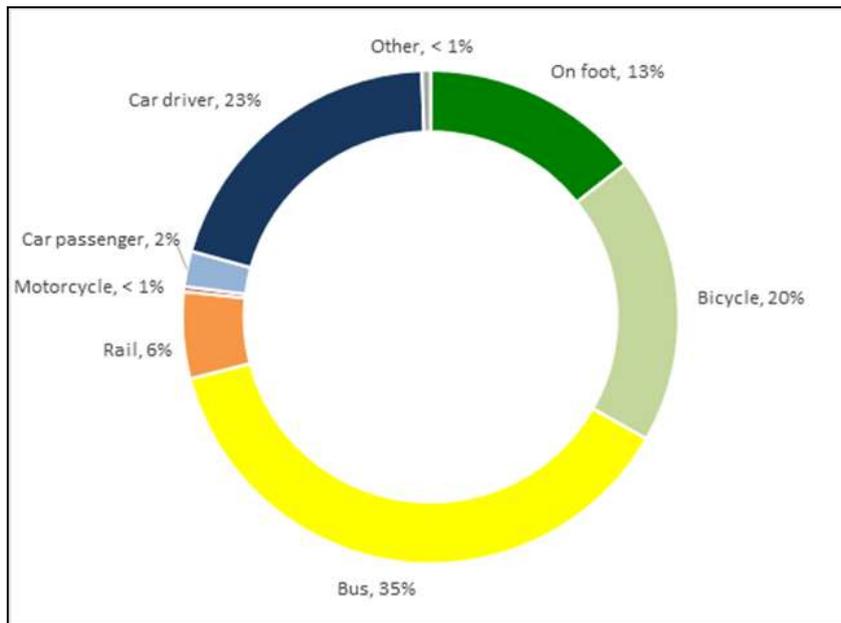
UCD undertake regular surveys to understand the travel patterns of the UCD population. These include the annual travel survey, a campus cordon survey (i.e. a one day count of all movements into and out of the campus) and as well as other surveys related to cycling and public transport. By monitoring these patterns, UCD has been able to introduce new schemes and initiatives at Belfield to respond to travel needs, measure their success and liaise with transport providers to inform the provision of new services.

Key findings from the 2015/16 travel survey are presented below.

12.4.9 Travel Mode Share

The overall mode share for staff and students to the Belfield campus is presented in Figure 12.16. Private vehicle transport (i.e. car drivers and passengers) has a mode share of 25%, public transport (i.e. bus and rail) has a mode share of 41%, while green modes such as walking and cycling have a mode share of 33%.

The travel mode share differs for staff and students due to a number of factors, including journey origins, arrival and departure times and their socio-economic background. For staff, the car driver mode share is 45% while for students, the car drivers mode share is 20%.

Figure 12.16 Campus Travel Mode Share (staff and student combined)

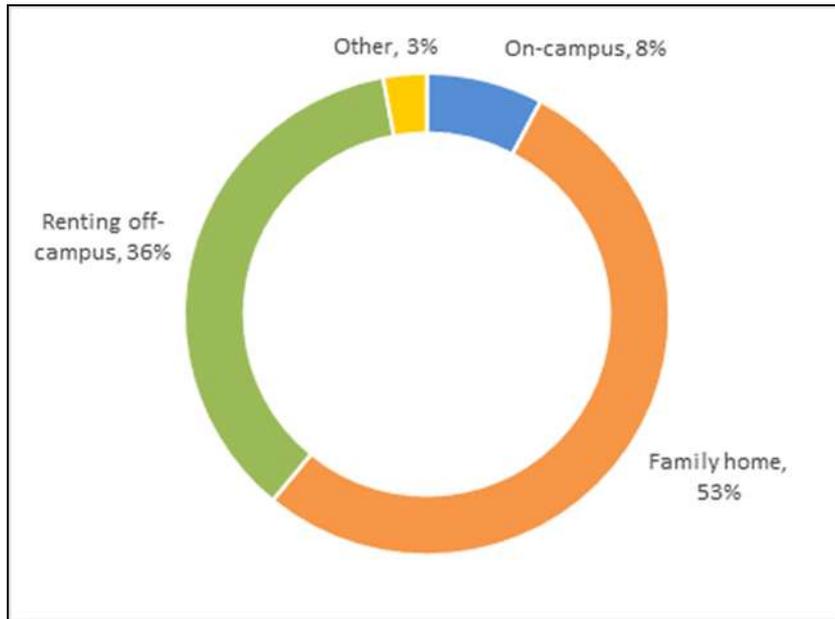
12.4.9.1 Journey Origins

The location from which the UCD population commute to the campus is a significant factor in terms what mobility choices are available to them.

The 2015 travel survey shows that students commute from widely dispersed areas throughout Dublin, however south Dublin continues to have highest student concentrations, especially among those in private rental accommodation.

Approximately 53% of students are seen to commute from their family home (see Figure 12.17) and have slightly more car centric commuting patterns than those in rental accommodation. Students renting will typically have reduced access to a car and therefore tend to choose locations along public transport routes or within walking and cycling distance of Belfield.

Apart from those living on campus, areas such as Blackrock, Stillorgan, Clonskeagh, and Rathfarnham have the largest student populations.

Figure 12.17 Student Accommodation Type

The majority of staff also commute from areas south of the city centre, with areas such as Blackrock, Rathmines, Rathfarnham and Stillorgan having the largest concentrations of staff.

As documented in the GDA Transport Strategy, there is a historical legacy which has seen significant levels of growth in suburban locations, typically at lower densities and unconnected to the public transport network. This trend is also representative of the locations that many UCD staff are commuting from.

12.4.9.2 Journey Distances

In recent years, the general trend has been one of staff and students living further away from the campus, with the proportion of those commuting 25km or more increasing as presented in Figure 12.18.

These trends can put additional pressure on transport networks and services, as generally the further from the campus, the more limited mobility choices there are. It is noted that areas close to the M50 (e.g. Tallaght and Ballinteer) and along the south-eastern coast (e.g. Sandycove and Dalkey) have the highest proportion of students and staff commuting by car.

Figure 12.18 Student Journey Distance Evolution



12.4.9.3 Journey Times

Consistent with the increase in journey distances, the travel trends since 2012 has also seen an increase in the proportion of student and staff journey times over 45 minutes increase, with a corresponding decrease in journeys less than 30 minutes.

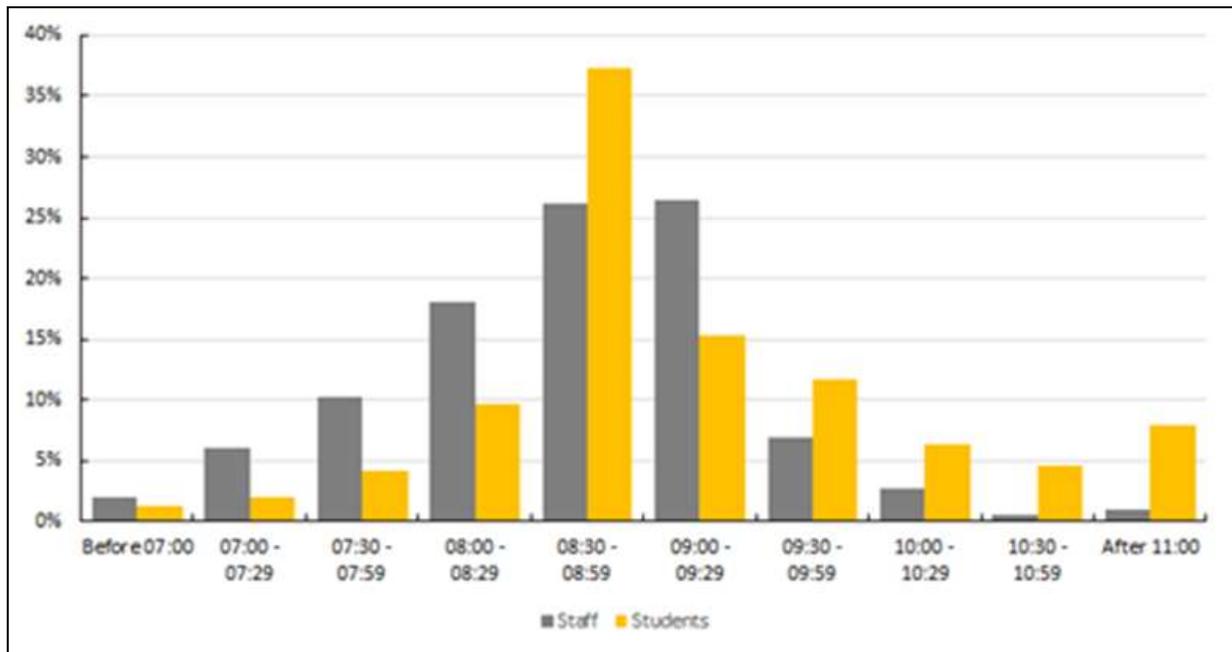
The 2015 travel survey has shown that 25% of students and 16% of staff have a commute of over 60 minutes to the campus. The estimated average journey time is 35-40 minutes. Students who responded as ‘living at the family home’ typically have longer journey times than those renting, highlighting the fact that students who rent generally choose locations that are more accessible to Belfield.

12.4.9.4 Arrival and Departure Times

The times at which people arrive and depart from the campus can impact on the capacity of both the public transport network and the surrounding road network, with a more even distribution of trips desirable to reduce commuter peak period impacts.

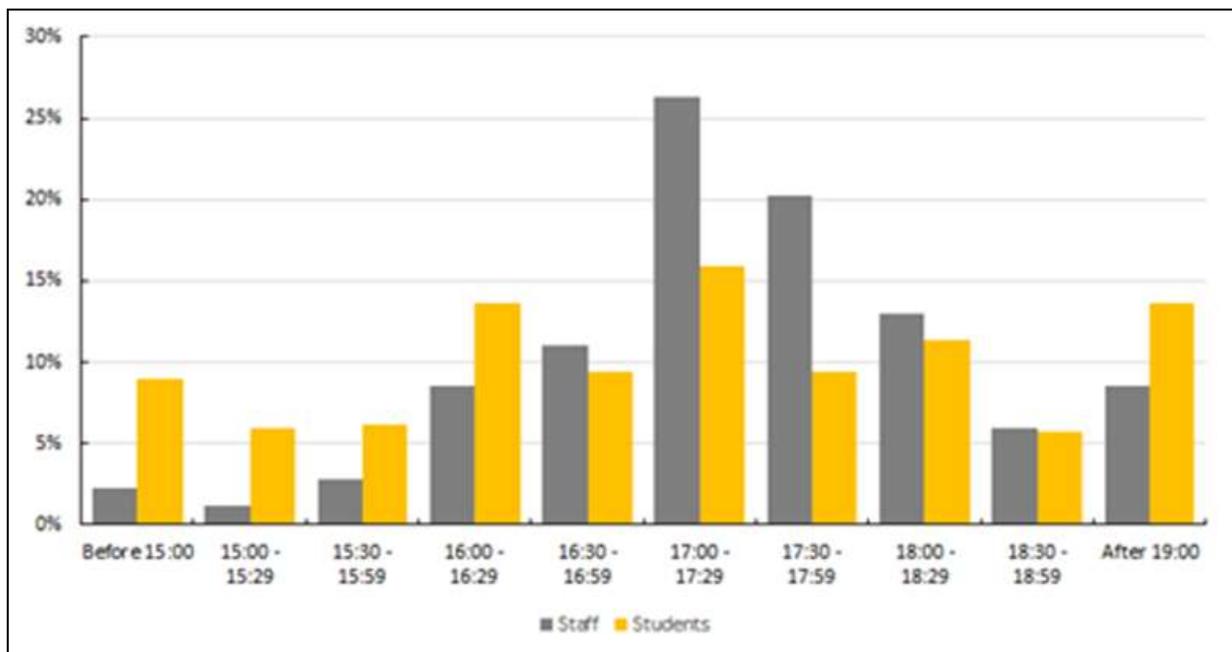
Approximately 53% of student and staff arrivals occur between 08:30 and 09:30, with student arrivals in particular peaking between 08:30 and 09:00 as presented in Figure 12.19.

Figure 12.19 Campus Arrival Profile



The departure profile is less pronounced, with 28% of departures occurring between 17:00 and 18:00. While student departures are relatively well distributed throughout the evening, there is a defined peak for staff departing during this period as presented in Figure 12.20.

Figure 12.20 Campus Departure Profile



12.5 Characteristics of Proposed Development

As described in more detail in Section 3 'Description of the Development', the proposed UCD Student Residences Masterplan will be located to the southwest of the campus core and consist of:

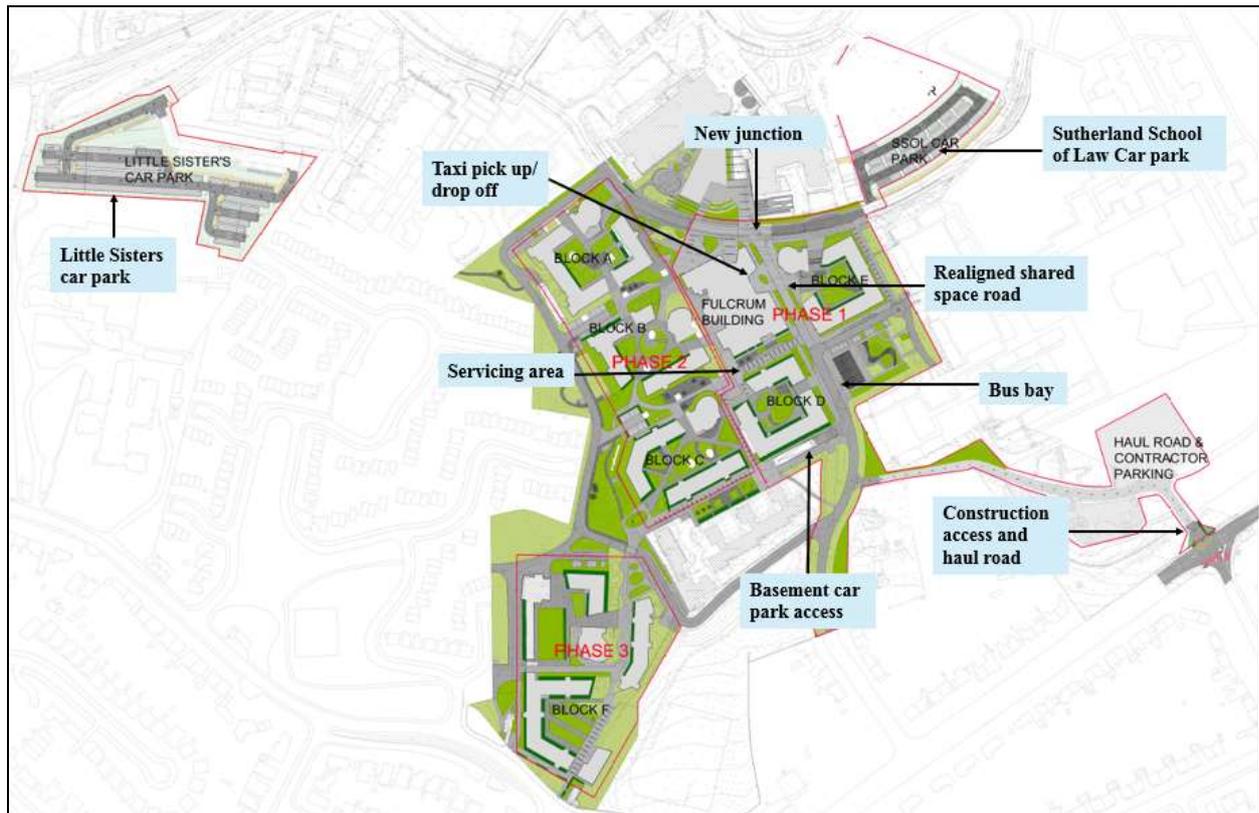
- 3,006 no. bedspaces comprising a mix of traditional student accommodation apartments, halls of residence, and studio apartments, arranged in a series of 6 Blocks, which will vary in height from 5 to 10 storeys;
- Activity Hubs within the blocks with lounge, function and study spaces;
- A student facility centre (Fulcrum Building), comprising of a multifunction function hall, Dining Hall with studio accommodation and student residences support facility above and supporting shops and services;
- A range of student amenity and common spaces, comprising a mix of outdoors spaces within the courtyards and immediately adjacent to the respective Blocks, and internal spaces within each Block and at Roebuck Castle; and
- An outdoor active and passive amenity area on the eastern part of the site.

The Blocks will be centred on courtyards and be linked visually and by a continuous pedestrian route to ensure integration between the proposed villages and also to facilitate linkages between the proposed accommodation and the existing student accommodation.

The transport related elements of the development are highlighted in Figure 12.21 and stated below:

- A realigned access road and new priority junction with the internal campus ring road. A significant portion of this road, as well a section of the existing ring road, will have a different pavement material, defining it as a shared space area;
- 2,104 long and short term cycle parking spaces associated with the residences;
- Set-Down area for buses and taxis drop off along the realigned access road from Owenstown Park;
- New basement car park which will provide approximately 637 spaces;
- The 'Little Sisters Car Park' will be increased by 225 spaces;
- New Sutherland School of Law car park with 100 spaces;
- New surface level parking within the proposed UCD Student Residences Blocks with 87 spaces;
- A new deliveries and servicing area will be provided to serve the Fulcrum Building;
- A temporary construction access and haul road off Fosters Avenue for the duration of the construction of the proposed development; and
- A temporary construction car park to ensure no overspill onto nearby residential areas.

Figure 12.21 Development Transport Features



12.5.1 Access and Circulation

This section presents the access strategy for the UCD Student Residences Masterplan.

12.5.1.1 Pedestrian Access

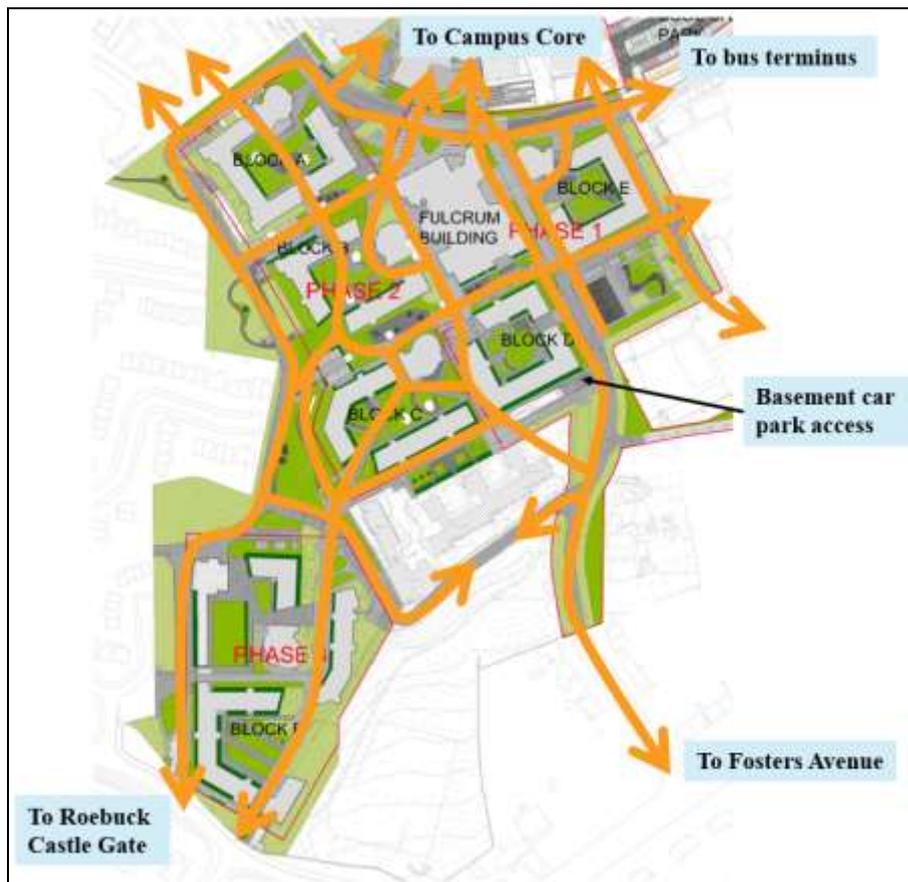
The UCD Student Residences Masterplan will create a highly permeable area in this part of the campus, with desire lines catered for by a dense pedestrian network as presented in Figure 12.22.

Footpaths will be provided along the realigned access road. Shared space for cyclists and vehicles will be provided north of the basement entrance. This will define the change in environment from vehicular priority to pedestrian and cyclist priority.

The shared space will extend to include a section of the internal ring road. This will help create a smooth transition between the educational and residential character areas. A high number of pedestrian crossing movements are envisaged in this area due to:

- The attraction of the Fulcrum building (which will contain the retail shop among other trip generators);
- The increased attractiveness of the Roebuck Castle pedestrian gate for entering and exiting the campus; and
- The increased number of residents walking between the campus core and the residences.

Figure 12.22 Pedestrian Access Proposals



12.5.1.2 Cycle Access and Provision

As set out above regarding pedestrian access, the proposed shared space areas and the permeability of residential area will also be of benefit to cyclists. Cyclists will be able to share the majority of the routes identified in Figure 12.22 with pedestrians, in particular the route to and from the Roebuck Castle gate.

2,104 cycle spaces will be provided across the development, of which 510 will be located in secure, purpose built cycle storage facilities in the basement. The remaining 1,594 on surface will be throughout the public realm conveniently located near the entrance of each residential building to facilitate short-term use by visitors.

At present, UCD monitor the adequacy of cycle parking provision on campus on a regular basis, providing additional spaces where required. UCD will continue to monitor this in the future, including the cycle parking area associated with the UCD Student Residences Masterplan.

12.5.1.3 Vehicular, Emergency and Service Access

The vehicular access strategy will generally follow the existing strategy for the campus, which consists of three main traffic cells (R138, Owenstown and Clonskeagh) defined by the closing of traffic barriers at peak times.

The vehicle access strategy for the proposed development includes the following primary elements as illustrated in Figure 12.22.

- Realignment of the existing access road from Owenstown Park. This will result in the existing signalised junction with the internal ring road being replaced by a priority junction at a location to the west. The location of access and egress points to the basement car park will reduce the number of vehicle movements in this area;
- Provision of a new access / egress to the basement car park off the realigned access road. This ramped, two-way access to the south of the site removes a significant amount of vehicular movements away from the main pedestrian crossing point to the north of the site. A secondary access point to the basement car park is also proposed, to be used in emergencies only;
- Provision of a new service area for delivery and waste collection will serve the restaurant, shop etc.;
- Creation of shared space area from north of the deliveries and waste collection access point, incorporating the traffic junction;
- Provision of a bus stop and set down area along the realigned access road; and
- Provision of a taxi pick up / drop off location beside the Fulcrum Building to facilitate residents to easily access taxis within the development.

Figure 12.23 Vehicular Access Proposals



Figure 12.24 shows the service and emergency routes available through the proposed development.

Figure 12.24 Services and Emergency Access Proposals



12.5.2 Car Parking Proposals

The following section presents the car parking proposals for UCD campus following the development of the UCD Student Residences Masterplan.

As part of the UCD Travel Plan 2016-2021-2026, as presented in Section 12.1.5, a car parking strategy has been prepared for the campus which has the following main objectives:

- To continue to manage car parking demand and levels of parking provision at a campus level;
- To provide a limited number of managed, dedicated, long-term 'car-storage' parking spaces for student residents on-campus;
- To increase the quantum of managed (i.e. pay and display) visitor parking in each traffic cell (total of approx. 150 spaces across campus) to address existing parking demand issues; and

- To accommodate planned increases in campus population while maintaining the number of parking spaces with a 'commuting impact' at existing levels or reduce where possible, so as not to impact on the surrounding road network.

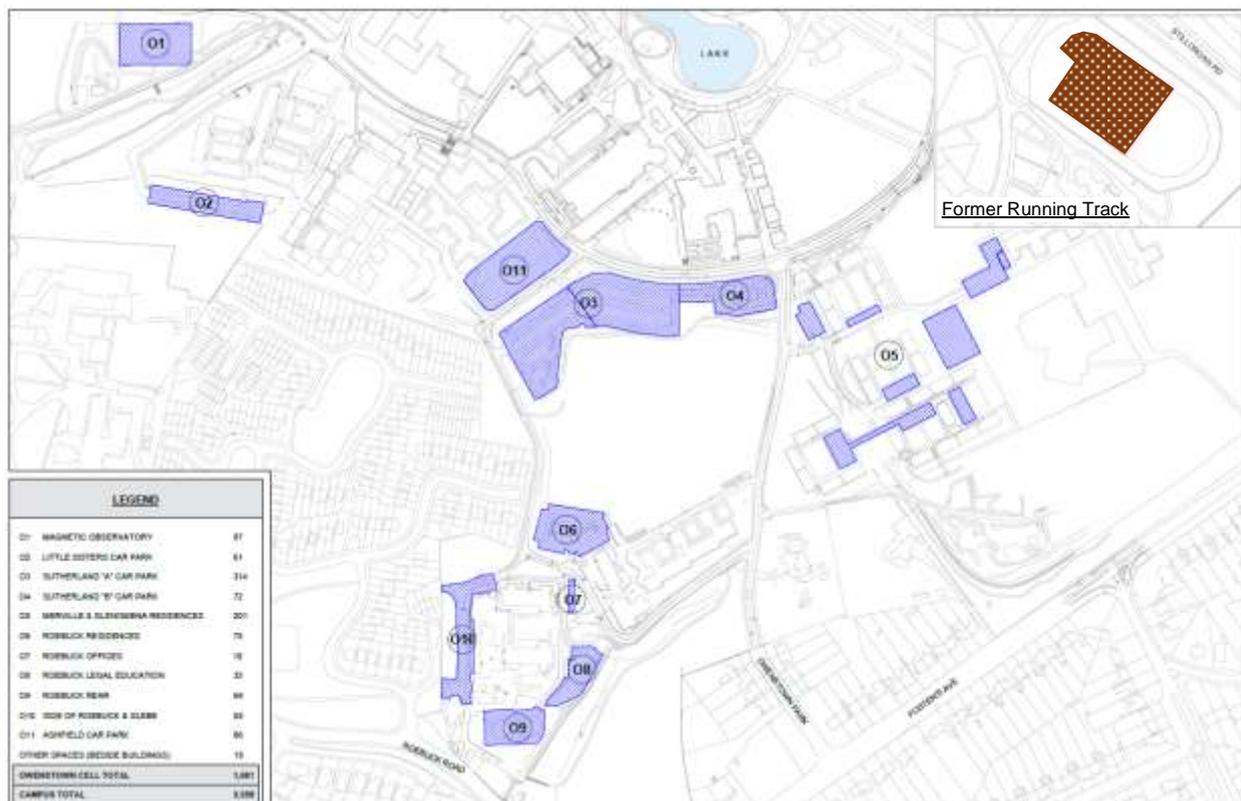
It has been agreed through the UCD Commuting Review Group, made up of UCD, the NTA and DLRCC, that the campus requires a maximum total of 3,568 by 2026 following the implementation of significant external public transport improvements. This maximum assumes the implementation of external transport schemes, if these schemes are not achieved by 2026 it can be assumed that a quantum between the interim provision of 3,724 spaces in 2021 and 3,568 spaces in 2026 may be applied.

12.5.2.1 Displaced & Removed Parking Spaces

A key element of the car parking strategy is the objective to replace existing surface car parks located within the heart of the campus with a smaller number of managed car parks located at the periphery, thus enabling the enhancement of the campus' core as a high-quality pedestrian zone. The proposed development will result in the displacement of a number of car parking spaces as a result of new buildings and the realigned internal road and access arrangements. A breakdown of these spaces is presented in Table 12.2, with the corresponding existing car park location plan presented in Figure 12.25.

It is proposed that a total of 177 spaces are removed from the Glenomena/Merville residences, which is consistent with UCD's aim to improve the public amenity space associated with student residences by removing car parking, as per the Belgrave Student Residences and this application. 128 spaces are to be removed from the former running track car park in the R138 cell.

Figure 12.25 Location of Car Parking



12.5.2.2 Proposed Parking Spaces

As part of the UCD Student Residences Masterplan the following car parking provision is proposed:

- New basement car park which will provide approximately 637 no. of parking bays;
- The 'Little Sisters Car Park' will be increased by 225 parking bays;
- New Sutherland School of Law car park with 100 spaces; and
- New surface level parking within the UCD Student Residence Blocks consisting of 87 spaces.

A breakdown of these spaces is presented in Table 12.2 and their location is presented in Figure 12.26.

Figure 12.26 Location of Proposed Parking Spaces

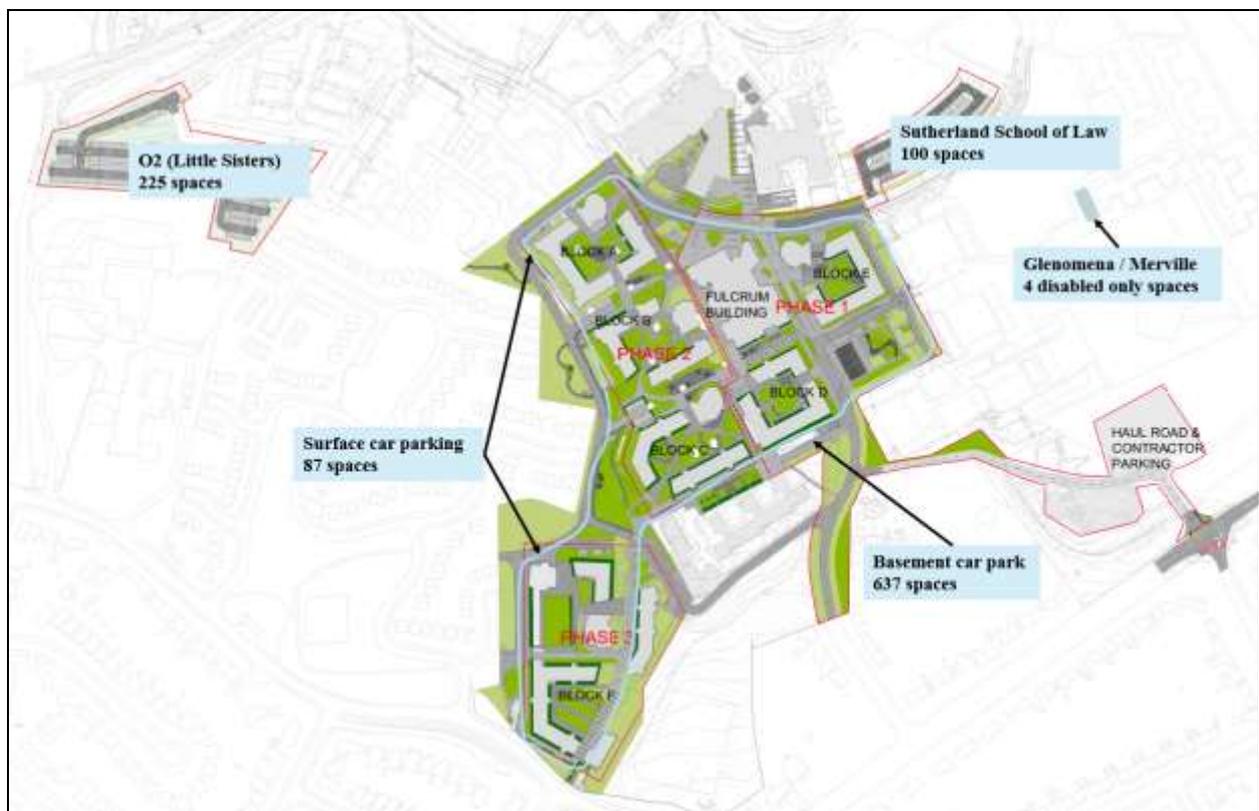


Table 12.2 UCD Campus Parking Provision

Car Park Name	Existing Spaces	Displaced Spaces	Remaining Spaces	Proposed changes	Total spaces
<i>Owenstown Breakdown</i>					
<i>O1 (Magnetic Observatory)</i>	87	0	87	0	87
<i>O2 (Little Sisters)</i>	61	0	61	+225	286
<i>O3 (Sutherland B)</i>	72	-72	0	0	0
<i>O4 (Sutherland A, C)</i>	314	-314	0	0	0
<i>O5 (Merville/Glenomena)</i>	201	-120	4	-177	4
<i>O6 (Roebuck Residences)</i>	75	-75	0	0	0
<i>O7 (Roebuck Offices)</i>	10	-10	0	0	0
<i>O8 (Roebuck Legal Education)</i>	33	-33	0	0	0
<i>O9 (Roebuck Rear)</i>	69	-69	0	0	0
<i>O10 (Roebuck Side and Glebe)</i>	55	-55	0	0	55
<i>O11 (Ashfield Residences)</i>	86	-86	0	0	0
<i>Other spaces beside buildings (mostly disabled)</i>	18	0	18	0	18
<i>New Basement car park</i>	-	-	-	637	637
<i>New Sutherland School of Law surface car park</i>	-	-	-	100	100
<i>New surface level parking (Block A, B, C)</i>	-	-	-	18	18
<i>New surface level parking (Roebuck)</i>	-	-	-	60	60
<i>New surface level parking (Block D, E)</i>	-	-	-	9	9
Owenstown Total	1,081	-734	347	872	1,219
Richview Total	148	-	148	-	148
Clonskeagh Total	1,090	-	1,090	-	1,090
Nova Total	124	-	124	-	124
Rosemount Total	29	-	29	-	29
R138 ¹ Total	1,086	-	954	-128	958
UCD Campus Total	3,558	-734	2,519	744	3,568

There is a net increase of 10 spaces within UCD campus while reducing the total number of car parks impacted from 12 to 8 locations in accordance with the objectives of the UCD Travel Plan which allows for 3,568 spaces throughout the campus in 2026.

¹ reduction corresponds to decommissioning of spaces at the former running track car park

The student resident spaces will be managed such that they are not accessible to staff and students commuting to the campus, or visitors. They will be designated for the use of student residents only and actively managed as part of the overall campus plan. The trips generated by these spaces will generally be outside of peak times and at weekends.

The proposed visitor parking spaces will also be managed in a way, which encourages a higher turnover of spaces.

12.5.2.3 Disabled Car Parking

The DLRCC Development Plan 2016-2022 states that for both residential and non-residential car parking, 4% of car parking spaces provided shall be suitable for use by disabled persons.

Within the proposed car parking locations there will be a total of 56 disabled parking spaces provided. It is proposed they will be located as follows:

- No. 12 in the Little Sisters car park;
- No. 35 at various locations throughout the UCD Student Residence Blocks;
- No. 5 in the New Sutherland School of Law car park; and
- No. 4 in the Merville / Glenomena residences.

This equates to 5% of the quantum of parking provided.

12.5.3 Compliance with UCD Car Parking Strategy

The present proposals are fully consistent with the aims for campus-wide car parking set-out in UCD's Travel Plan, in terms of quantum, location and type of parking.

12.5.3.1 Quantum of Parking

The proposals include the replacement of impacted existing spaces, the provision of additional car parking, as well as the decommissioning of existing spaces within the UCD campus (Owenstown Park and R138 traffic cells). These changes result in a net increase of only 10 spaces campus wide.

12.5.3.2 Location of Parking

The proposals include the relocation of a large number of existing surface car parking to a covered, managed facility within the basement of the student residences. This is consistent with the objective of consolidating car parking on higher-density facilities at the periphery of the campus core, thus enabling the creation of high-quality pedestrian and cycle areas at the heart of Belfield campus.

12.5.3.3 Type of Parking

The Travel Plan identifies the need to increase the availability of visitor (pay&display) car parking across the campus, with a particular deficit having been identified at the Owenstown Park traffic cell. The Travel Plan also identified the need to provide a limited number of dedicated student residence 'car storage' spaces.

12.6 Potential Impacts of Proposed Development

This section presents the potential traffic impact of the proposed development during the construction and operational stages.

12.6.1 Construction Phase

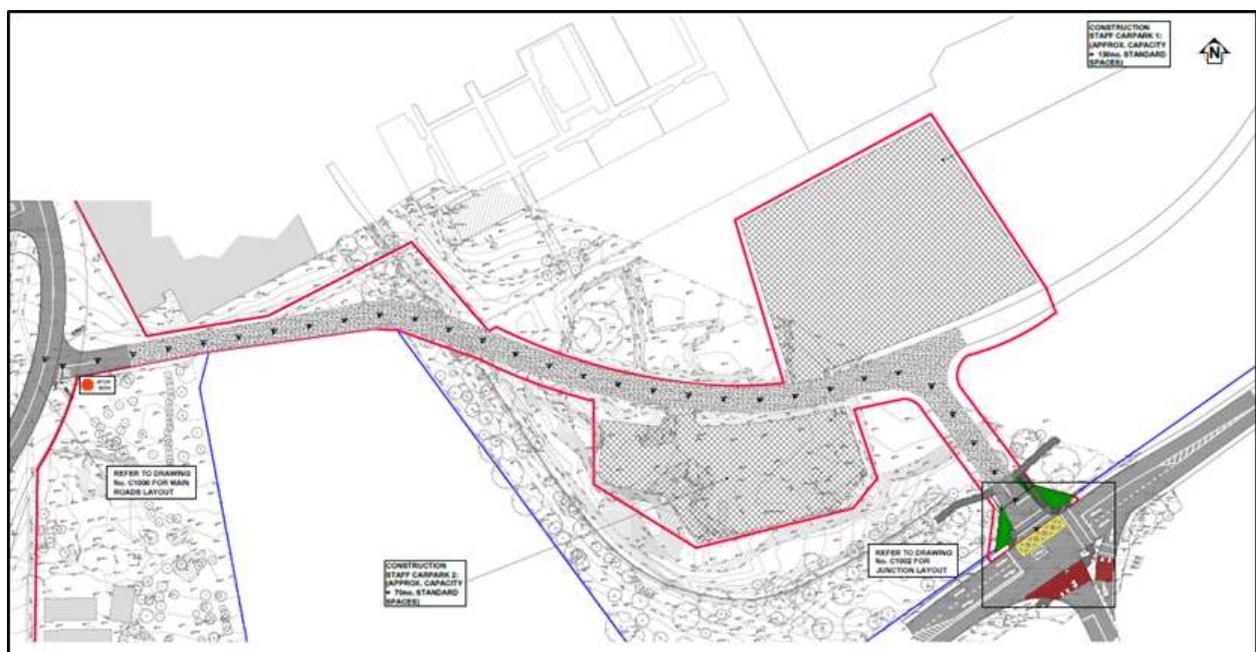
The following section describes the construction strategy, including an appraisal of the likely impact the proposed development will have on the surrounding street network. The appraisal is based on the sequence of construction works set out in the 'Waste Management Plan and Construction Management Plan'.

It is anticipated that the construction of the UCD Student Residences Masterplan will be carried out in three phases. In terms of general traffic generation and impact on the surrounding road network, the critical period will be the construction stage, as traffic flows generated by the construction works will be higher than those when the student residences are occupied.

12.6.1.1 Routes and Traffic Generation

During the construction stage, a temporary 'construction only' access is proposed at the junction of North Avenue and Fosters Avenue which will then connect with the internal construction haul road as presented in Figure 12.27.

Figure 12.27 Proposed Construction Access and Road Layout



This access will need to be signalised and therefore it will require the following changes to the Fosters Avenue / North Avenue junction as stated below and presented in Figure 12.28:

- Provision of a short right-turn pocket on Fosters Avenue into UCD; and

12.6.1.3 Construction Car Parking

It is proposed to provide construction staff parking spaces during the construction stage. This will mitigate the potential for car parking overspill onto nearby residential areas and the UCD campus. An area with capacity for 200 parking spaces along the construction access road has been identified as a potential location for construction staff car parking, but the exact quantum and location of this car parking will be determined by the Contractor and may vary to respond to the requirements of each construction phase.

Construction staff will be, as much as possible, encouraged to use sustainable forms of transport to travel to and from the site (i.e. public transport, walking, cycling and car-pooling). The Construction Management Plan, which will be submitted to DLRCC for agreement prior to commencement of works, will include a suite of measures that will encourage staff to travel by sustainable modes of transport.

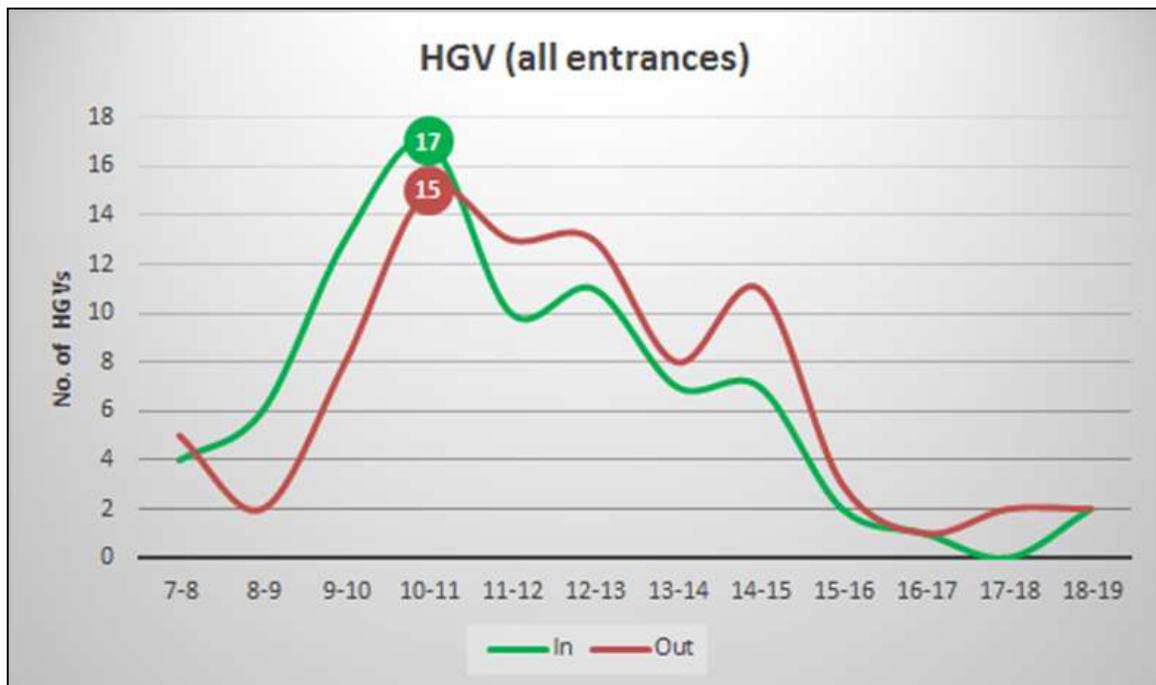
Construction staff will not be permitted to use the existing staff and student permit parking spaces on campus during term time. UCD will restrict and control construction staff parking through its demand management / permit parking systems on campus.

12.6.1.4 Construction Traffic Impact

By way of understanding construction traffic impact, it is assumed that the quantum of construction traffic that will be generated by the proposed development will be of a similar scale and profile to that generated during the recent construction of the Ashfield residences and Confucius Institute that overlapped.

The profile of HGV movements to and from the campus during that time, based on surveys carried out in October 2015, is presented in Figure 12.29.

Figure 12.29 HGV Profile



It is anticipated that there will be a peak of 32 two-way HGV movements to and from the campus during the most intensive period of the works associated with the UCD Student Residences Masterplan. The peak HGV movements are anticipated to occur outside of peak commuting hours as shown in Figure 12.29.

During the morning peak commuting hour (08:00-09:00), at the peak construction period, approximately 8 two-way HGV movements are anticipated. All peak time HGV movements will use the temporary construction access and haul road off Fosters Avenue, with a 50/50 distribution in terms of movements from the R138 Stillorgan Road and the R112 to and from the campus.

Construction staff traffic movements will generally occur before 08:00 and therefore avoid the morning road network peak. For assessment purposes, it has been assumed that 25 construction staff vehicle trips will occur during the morning peak, with a similar distribution to that of the HGV movements.

Taking the above trip generation and distribution into account, it is forecast that there will be a 1% increase in traffic volumes along Fosters Avenue (16 trips) and a 2% increase in traffic volumes at the junction of Fosters Avenue and North Avenue (33 trips).

Junction Analysis

The existing junction operates as a signal-controlled junction and incorporates a pedestrian crossing on Fosters Avenue and on North Avenue. Table 12.3 presents the existing and predicted future operation of the junction based on the modified layout and future traffic flows associated with both construction vehicles and construction staff as described above.

Table 12.3 R112 Fosters Avenue / North Avenue / UCD Construction Access

Approach (critical movement)	Existing AM peak (08:00-09:00)		Future AM peak (08:00-09:00)	
	Deg. Sat	Mean Max Queue (PCUs)	Deg. Sat	Mean Max Queue (PCUs)
Fosters Avenue (Westbound)	65.7%	8	67%	8
North Avenue	72.2%	7	74.3%	8
Fosters Avenue (Eastbound)	74%	10	75.1%	10
UCD Construction Access	-	-	2%	0.1

The analysis of the existing junction operation indicates that the junction has capacity with moderate levels of queuing on each of the arms. This junction is occasionally impacted by queuing at downstream junctions such as the Stillorgan Road/Fosters Avenue junction, leading to higher levels of queuing.

The analysis undertaken illustrates that the additional construction traffic movements to and from the new arm will be incorporated into the existing junction phasing, with negligible impact due to the relatively low traffic volumes.

12.6.2 Operational Phase

The overall impact of the proposed development will be positive for UCD and the surrounding road network. In qualitative terms, notwithstanding the significant planned increase in campus population, the proposed UCD Student Residences Masterplan will ensure that there will not be any material increase in external traffic impact on the surrounding road and street network during the morning and evening peak commuter periods.

The UCD Student Residences Masterplan when completed will effectively remove the commuter peak periods traffic demand for 3,006 students as they will be based on campus.

These students would otherwise be commuting from off-campus accommodation, a demographic which, according to the 2015/16 travel survey, has a car travel mode share of 16%. The proposed development will therefore reduce the number of car trips during peak times while also providing additional capacity on buses at peak times.

12.7 Ameliorative, Remedial or Reductive Measures

The following summarises the key mitigation measures proposed to manage the travel demand generated by the development during the construction and operational phases.

12.7.1 Construction Phase

A detailed Construction Traffic Management Plan, which will incorporate the relevant traffic management measures included for in the Outline Construction Management Plan, will be finalised for the construction stage of the project by the Contractor. This Plan will include the following transport-related measures:

- Working hours that will avoid any significant staff trips during peak hours;
- Appropriate amount of car parking for construction staff to mitigate any potential car parking overspill onto the surrounding residential areas;
- The separation of construction traffic from general traffic through the provision of a temporary construction vehicle only access off Fosters Avenue;
- The management and marshalling of construction vehicles on-campus by flag men; and
- The Contractor will be required to implement a Mobility Management Plan for its staff, where travel by sustainable modes and car-pooling will be encouraged.

12.7.2 Operational Phase

Travel demand at UCD is currently managed at a campus wide level rather than at a specific development project level at Belfield and in accordance with the UCD Travel Plan. It is intended that the Travel Plan for UCD will continue to adopt this approach, and in partnership with DLRCC and the NTA.

As set out in Section 12.6.2 the completion of the UCD Student Residences Masterplan will have an overall relatively significant positive impact in terms of dealing with increases in travel demand to and from UCD by sustainable travel modes (i.e. walking, cycling and public transport). Quantitatively, the planned increase in

student residential capacity on campus will ensure that planned increase in campus population growth will not have any material impact on external transport networks, including the surrounding road and street network.

12.8 Monitoring

As part of the ongoing commuting monitoring process undertaken by UCD, the impact of the development will also be measured. In particular, UCD will continue to carry out annual travel surveys to identify changes in travel patterns among staff and students. Surveys in relation to the residential car parking spaces and visitor parking spaces will also be undertaken regularly to ensure appropriate usage. Corrective measures will be actioned by the UCD Estate Services should any misuse be identified.

A steering group made up of UCD, the NTA and DLRC (the 'UCD Commuting Review Group') will continue to meet quarterly to provide the forum for discussion and resolution of all matters relating to transportation that affect UCD, including the changes proposed as part of the UCD Student Residences Masterplan.

12.9 Reinstatement

The temporary construction access off Fosters Avenue will be reinstated following the completion of the Masterplan, with the boundary fence also reinstated