

CHAPTER 12

TRAFFIC AND TRANSPORT

12.0 TRAFFIC AND TRANSPORT

12.1 INTRODUCTION

This chapter of the EIAR assesses the likely effects of the proposed development in terms of vehicular, pedestrian and cycle access during the construction and operational phases of the proposed development.

This Chapter of the EIAR has been prepared by Mark McKenna BEng (Hons) MSc CEng MIEI. Mark is a Chartered Senior Transportation Engineer with over 10 years experience in the design and planning of traffic & transportation projects. Projects have included works associated with the commercial, residential and transport infrastructure sectors. Mark has been involved in leading the traffic and transport deliverables of development planning applications including the generation of Traffic & Transport Assessments, Mobility Management Plans and Traffic & Transport input into Environmental Impact Assessment Reports.

The information outlined within this chapter has been extracted from the proposed development's Traffic and Transport Assessment (TTA) Report which has been submitted as part of this planning application and should be referenced for further details of the assessment undertaken.

12.2 STUDY METHODOLOGY

Overview

The methodology incorporated a number of key inter-related stages, including:

- **Site Audit:** A site audit was undertaken to quantify existing road network issues and identify local infrastructure characteristics, in addition to establishing the level of accessibility to the site in terms of walking, cycling and public transport. An inventory of the local road network was also developed during this stage of the assessment.
- **Traffic Counts:** Classified junction traffic counts in addition to automatic traffic counts were undertaken and analysed with the objective of establishing local traffic characteristics in the immediate area of the proposed residential development.
- **Trip Generation:** A trip generation exercise has been carried out to establish the potential level of vehicle trips generated by the proposed residential development.
- **Trip Distribution:** Based upon both the existing and future (for the adopted assessment horizon years) network characteristics, a distribution exercise has been undertaken to assign site generated vehicle trips across the local road network.
- **Network Impact:** Ascertain the specific level of influence generated by the proposed development upon the local road network and subsequently identify which junctions need to be assessed in greater detail in accordance with the appropriate NRA (TII) guidelines.
- **Network Analysis:** Further to quantifying the predicted impact of vehicle movements across the local road network for the adopted optimum site access strategy more detailed computer simulations have been undertaken to assess the operational performance of key junctions in the post development 2024, 2028 and 2038 development scenarios.
- **Sensitivity Analysis:** Detailed computer simulations have been undertaken to assess the operational performance of key junctions for 2 no. Sensitivity Analysis scenarios which incorporate future development on the wider KDA2 lands.

Background

The approach to this assessment accords with policy and guidance both at a national and local level. Accordingly, the adopted methodology responds to best practices, current and emerging guidance, exemplified by a series of publications, all of which advocate the adopted method of analysis. Key publications consulted include:

- ‘Guidelines on the Information to be contained in Environmental Impact Assessment Reports’ (May 2022) Environmental Protection Agency
- ‘Traffic and Transport Assessment Guidelines’ (May 2014) Transport Infrastructure Ireland,
- ‘Traffic Management Guidelines’ Dublin Transportation Office & Department of the Environment and Local Government (May 2003);
- Guidelines for Traffic Impact Assessments’ The Institution of Highways and Transportation;
- Celbridge Local Area Plan 2017-2023; and
- Kildare County Development Plan 2016-2022

Impact on Junctions

The TII document ‘Traffic and Transport Assessment Guidelines (2014)’ states that the impact of a proposed development upon the local road network is considered material when the level of traffic it generates surpasses 10% and 5% on normal and congested networks respectively. When such levels of impact are generated a more detailed assessment should be undertaken to ascertain the specific impact upon the networks operational performance. In accordance with TII guidelines we have undertaken an assessment to establish the potential level of impact upon the key junctions of the local road network. To enable this calculation to be undertaken we have based the analysis upon the 2024 Opening Year and 2029 & 2039 Future Design Years. There are currently no definitive criteria for assessing “significance of effects” for traffic impacts for EIA in Ireland. As introduced above, TII guidance does provide thresholds for determining when to carry out a traffic assessment for a planning application: if a proposed development is likely to increase traffic by 10% (or 5% in traffic sensitive or congested areas), the planning application should be accompanied by a traffic assessment. It should be noted that the TII guidance does not provide criteria for assessing significance of impacts for EIA purposes. Nevertheless, the prevailing traffic levels local to the proposed development and professional judgement, a significance effect rating has been assigned to the different levels of potential traffic increases (see **Table 12.1**). This is intended to guide the assessment of the potential impact of the proposed development.

Significance of Effects	Traffic Increase
Imperceptible	0-2.5%
Not Significant	2.5-5%
Slight	5-10%
Moderate	10-20%
Significant	20-30%
Very Significant	30%-50%
Profound	50%+

Table 12.1: Rating of Effects

12.3 THE EXISTING RECEIVING ENVIRONMENT (BASELINE SITUATION)

Land Use and Location

The subject Phase 1 site is located on a greenfield site that has an approximate application site area of c.13.4 hectares. The development site is located in the Ballyoulster area of Celbridge and is approx. 1.3km east of Celbridge Town Centre. The subject KDA2 lands are zoned “C: New Residential plus part of the secondary link street and creche is on lands zoned “E: Community and Educational”. The subject site is bounded to the north by, development lands zoned “E: Community and Educational”, Donaghcumper Cemetery and Dublin Road (R403), residential units in Primrose Gate to the south, Rye River Brewing Co. and Ballyoulster Park to the east and Shinkeen Road to the west.

The site is located approx. 5.5km west of Lucan, approx. 14.8km north-west of Citywest and 20km away from Dublin City Centre. Nearby towns such as Leixlip is located to the north-east (approx. 5.2km), Maynooth to the north-west (approx. 8km) and Naas to the south-west (approx. 21km). The majority of suburbs in west Dublin (Ballyfermot, Blanchardstown, Citywest and Lucan) can be accessed within 20 minutes by a car. The general location of the subject site in relation to the surrounding towns is illustrated in **Figure 12.1** below whilst **Figure 12.2** indicatively shows the extent of the subject site boundary and neighbouring lands.

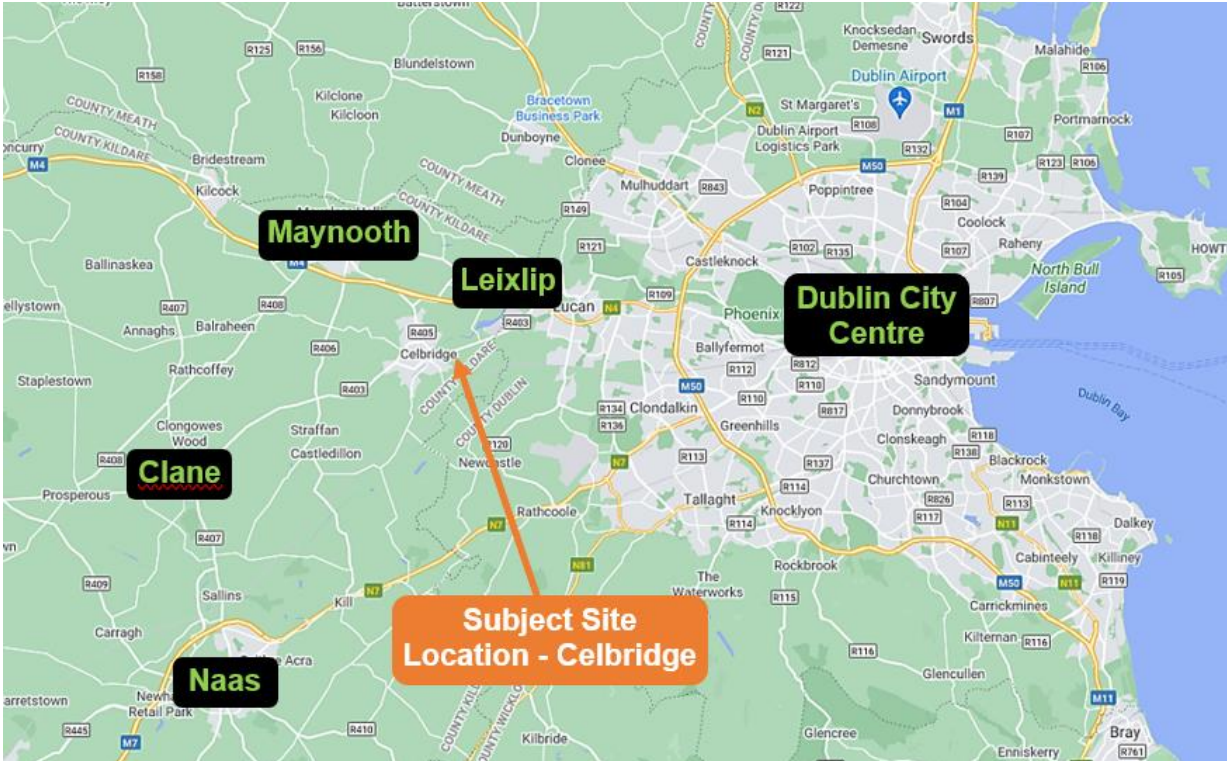


Figure 12.1: Site Location

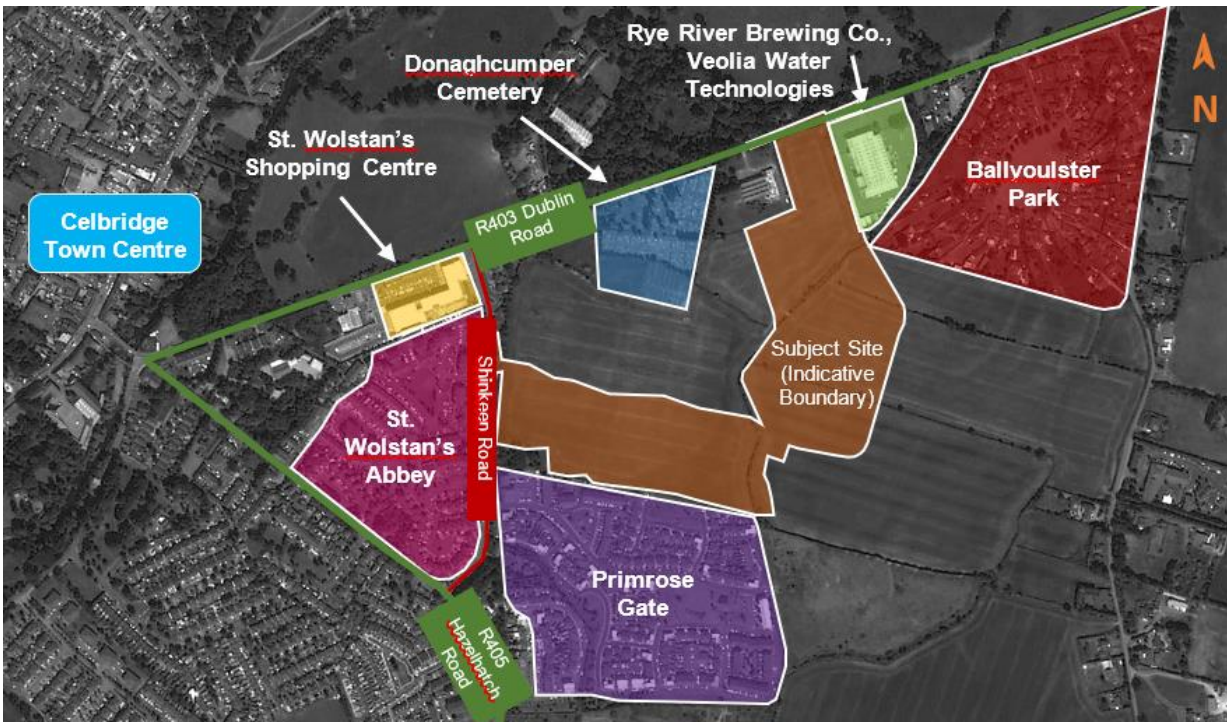


Figure 12.2: Subject Site Indicative Boundary

Existing Transport Infrastructure

Road Network

The subject site is located to the south of Dublin Road (R403) and east of Shinkeen Road. Travelling eastwards on the R403, provides links to Leixlip via the R404. The R403 terminates at the R148 / M4 (Junction 5) approx. 4.1km to north-east. The M4 Junction 5 Interchange located close by provides convenient access to the strategic M4/N4 road network which subsequently provides vehicular connectivity to locations including Dublin to the east and Maynooth, Kilcock and Enfield in the west.

Travelling westward from the subject site on the R403, leads to Celbridge Town Centre joining the R405 at the Liffey Bridge which leads to Celbridge Main Street. At Main Street, the road separates into the R403 which provides access towards Clane to the west and the R405 which gives access to the M4 Business Park to the North and Maynooth to the northeast.

Travelling in a southwards direction on Shinkeen Road, provides access to the R405 corridor which provides further connections to Hazelhatch and Celbridge Train Station, Newcastle and Rathcoole (via the R120). **Figure 12.3** below illustrates the existing road network in the vicinity of the subject site.



Figure 12.3: Existing Road Network

Existing Cycling and Pedestrian Facilities

Pedestrians can benefit from a continuous footway on the northern side of Dublin Road (R403) along the frontage of the subject site. Footways are intermittent on the southern side of this road with facilities being provided on approach to the Dublin Road / Shinkeen Road signalised junction and along the frontage of Rye River Brewing Company. The Dublin Road / Shinkeen Road junction benefits from controlled pedestrian crossings on all arms with appropriate tactile paving. Street lighting is provided on the southern side of the road and a signal controlled pedestrian crossing is available in the vicinity of Ballyoulster Park to the north east providing a controlled crossing point for access to / from bus stops located here. Vehicular traffic travelling along the section of the R403 Dublin Road in the vicinity of the subject site is restricted to 50kph speed limit.

Shinkeen Road currently benefits from good quality pedestrian and cyclists facilities. Segregated footways which are separated from vehicular traffic by grass verges and on-road mandatory cycle lanes are provided on both sides

of the corridor (Ref. **Figure 12.4**). Public lighting is provided on western side and a dedicated signal controlled pedestrian crossing is in place in the vicinity of the Primrose Gate entrance.



Figure 12.4: Pedestrian / Cycle facilities on Shinkeen Road

The southern section of the R405 (from the Shinkeen Road junction) provides a cycle track and footway (segregated by way of surface and road markings) on the western side of the R405 road corridor for approximately 800m to Celbridge & District Tennis Club. From this location, a shared cycle / pedestrian facility is available as far south as the non-vehicular access to Hazelhatch and Celbridge Train Station.

The R403 / R405 / Newtown Road junction (the eastern side of Liffey Bridge) provides footways and benefits from zebra crossings accompanied by Belisha beacons on three of the four arms. Liffey Bridge contains a narrow footway which is provided on the northern side of the bridge. Nevertheless, a pedestrian bridge over the River Liffey (approx. 46m in length) connects Newtown Rd and English Row (R403). This crossing is located adjacent Liffey Bridge and benefits from public lighting.

Existing Public Transport

The first two phases of the Bus Connects Network Redesign have commenced. Included within Phase 2 are Dublin Bus Services C4, C6, X27, X28, L58 and L59 which operate within Celbridge replacing the previous Dublin Bus Services 67, 67x and 67n with two additional 'Local' Routes L58 and L58 which provide convenient bus connections to Rail services available at the Hazelhatch & Celbridge Train Station. The C4 bus service operates between Ringsend and Maynooth with a 30 minute frequency whilst the X27 and X28 offer express services between Celbridge and UCD (Belfield) every 15-20 minutes during peak times. The C6 Route provides a nightly service between Maynooth and Ringsend operating between midnight and approx. 05:00. The Go-Ahead Commuter Route 120 is accessible on English Row in Celbridge Town Centre and operates between Connolly Station and Edenderry. **Table 12.2** below summarises the number of aforementioned services which are available within the local area and **Figure 12.5** illustrates the bus stops around the subject site.

Bus Service	Route No.	Route (Two-Way)	Mon - Fri	Sat	Sun
Dublin Bus	C4	Ringsend to Maynooth	36	35	34
		Maynooth to Ringsend	37	36	34
	L58	Louisa Valley to Hazelhatch Station (via Castletown)	37	32	29
		Hazelhatch Station to Louisa Valley (via Castletown)	36	32	29
	L59	Louisa Valley to Hazelhatch Station (via Glen Easton)	36	32	29
		Hazelhatch Station to Louisa Valley (via Glen Easton)	35	32	29

Bus Service	Route No.	Route (Two-Way)	Mon - Fri	Sat	Sun
	X27	UCD (Belfield) to Celbridge (Salesian College)	5 ²	-	-
		Celbridge (Salesian College) to UCD (Belfield)	6 ¹	-	-
	X28	UCD (Belfield) to Celbridge (Salesian College)	5 ²	-	-
		Celbridge (Salesian College) to UCD (Belfield)	5 ¹	-	-
Go-Ahead	120	Connolly Station to Edenderry	31	24	13
		Edenderry to Connolly Station	31	25	13

¹ Operates in the AM period only ² Operates in the PM period only

Table 12.2: Bus Services - Number of Services (Source: Transport for Ireland)



Figure 12.5: Existing Bus Stop Locations

The Hazelhatch and Celbridge Train Station is located approximately 1.9km from subject site’s access on Shinkeen Road. This station can accommodate up to 228 no. cars on-site providing a conveniently located Park & Ride facility in close proximity to the subject site. In addition, newly implemented Bus Connect ‘Local’ Routes L58 and L59 (which are easily accessible from the subject site location as discussed in the previous section) provide bus access to this station.

The established rail infrastructure operated by Iarnród Éireann provides linkages to key destinations such as Dublin (Connolly / Heuston Station), Galway and Cork via number of other regional locations. **Table 12.3** below presents a summary of the main rail services available at the Hazelhatch and Celbridge Station.

Route	Mon – Fri	Sat	Sun
Dublin to Cork / Celbridge	45	19	5
Cork / Celbridge to Dublin	32	18	5
Dublin to Portlaoise	12	8	5
Portlaoise to Dublin	14	7	5
Dublin to Galway	-	-	-

Route	Mon – Fri	Sat	Sun
Galway to Dublin	1	-	-
Celbridge to Waterford	2	1	-
Waterford to Celbridge	2	-	-

Table 12.3: No. of Rail Services available at Hazelhatch and Celbridge (Source: Iarnród Éireann)

Existing Public Transport Capacity

It is widely accepted in the industry that the periods of maximum demand generated upon the public transport networks on a typical weekday are focused upon the AM (06:00-10:00) and PM (16:00-20:00) periods as predominantly influenced by travel to work, school, and college patterns at any given location.

The existing capacity on the local public transport network has been determined based on (i) frequency of services (i.e. timetabled services) and (ii) type / size of vehicle.

The existing public transport services accessible from the subject development site include the bus services accessible on the Dublin Road, Shinkeen Road, the R405 and Celbridge Town Centre as discussed previously and rail services available at Hazelhatch & Celbridge accessible by car (Park & Ride facilities available), bus (L58 & L59) and by active travel modes.

Table 12.4 below provides a summary of the bus capacity during the identified peak public transport patronage times (i.e. 06:00-10:00 in the AM & 16:00-20:00 in the PM).

The existing bus capacity analysis reveals that, during peak travel periods, the existing bus services have the capacity to accommodate up to 6244 no. passengers in the AM peak period and 6356 no. passengers in the PM peak period.

Bus Service	Route No.	Route	AM (06:00-10:00)		PM (16:00-20:00)	
			Services	Capacity	Services	Capacity
Dublin Bus	C4	To Maynooth	7	672	8	768
		To Dublin	8	768	8	768
	L58	To H&C Station	8	768	8	768
		From H&C Station	8	768	8	768
	L59	To H&C Station	8	768	8	768
		From H&C Station	8	768	8	768
	X27	To Celbridge	0	0	4	384
		To Dublin	6	576	0	0
	X28	To Celbridge	0	0	5	480
		To Dublin	5	480	0	0
Go-Ahead	120	To Edenderry	4	208	10	520
		To Dublin	9	468	7	364
Total Bus Capacity			71	6244	74	6356

Table 12.4: Calculated Existing Bus Capacity

Table 12.5 below provides a summary of the rail capacity during the identified peak public transport patronage times (i.e. 06:00-10:00 in the AM & 16:00-20:00 in the PM).

The existing rail capacity analysis reveals that, during peak travel periods, the existing rail services have the capacity to accommodate up to 6812 no. passengers in the AM peak period and 6288 no. passengers in the PM peak period.

Direction	AM (06:00-10:00)		PM (1600-20:00)	
	Services	Capacity*	Services	Capacity*
From Dublin	9	2358	14	3668
To Dublin	17	4454	10	2620
Total	26	6812	24	6288

* Assumed 4 no. carriages

Table 12.5: Calculated Existing Rail Capacity

It is noted that this capacity analysis considers only existing bus / rail services and does not take cognisance of future bus network improvements being proposed as part of the Bus Connects proposals (as outlined later in this chapter) some / or all of which could be implemented by the subject development’s adopted Opening Year of 2024 or DART+ proposals.

An assessment of the project demand and associated impact on the current bus transport capacity as a result of the subject residential development is outlined in later in this Chapter.

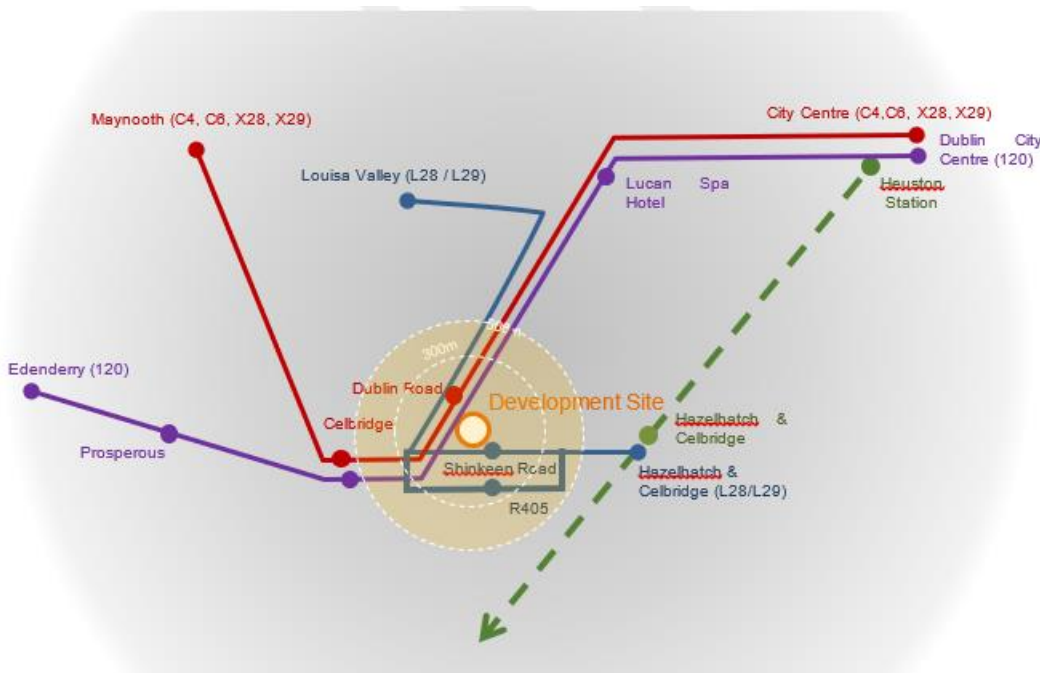


Figure 12.6: Existing Public Transport Services Catchment Schematic

Future Transport Improvements

Cycle Network Proposals - GDA Cycle Network Plan

The subject site lies within the “North Kildare” area as outlined within the Greater Dublin Area Cycle Network Plan (2013). The sector covers Leixlip, Celbridge and Maynooth. These proposals are yet to be constructed in the vicinity of the development site and include the formation of the following key routes:

- C1: R405 Newcastle Road to Hazelhatch and Celbridge railway station and the Grand Canal Greenway.
- C2: Clane Road to Main Street.
- C3: Oldtown (Ring) Road to Church Road.
- C4: R403 Clane Road & Oldtown Road to Maynooth Road.
- C5: Willowbrook Road.
- C6: R405 Maynooth Road.
- C7: R449 Celbridge to Leixlip Link Road (across M4 Junction 6).
- C8 / C8a / C8b: Castletown Demesne Greenways to Barnhall Road, Leixlip and links to C6 & C7.

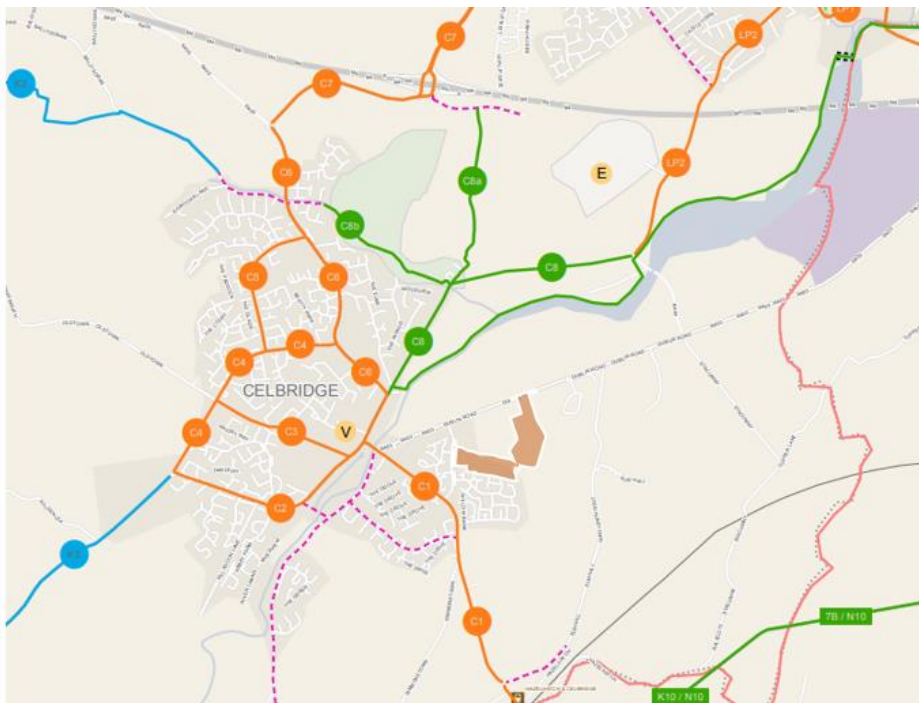


Figure 12.7: Proposed Cycle Network (Source: Sheet N16 GDA Cycle Network Plan)

Public Transport Proposals – BusConnects

BusConnects is an initiative launched by the NTA with the aim of overhauling the bus system in the Dublin Region. This initiative includes review of bus services, the core bus network which comprises radial, orbital and regional core bus corridors. It also includes enhancements to ticketing and fare systems as well as a transition to a new low emission vehicle fleet.

This initiative in the long-term proposes to implement a redesign of the existing bus network. The fundamental changes to the network expected would be as follows:

- Increasing the overall amount of bus services. Providing new and frequent orbital services connecting more outer parts of the city together;

- Simplifying the bus services on the key radial into “Spines” where all buses will operate under a common letter system and buses will run very frequently and be more evenly spaced;
- Increasing the number of routes where buses will operate every 15 minutes or less all day;
- The frequent network would become a web-shaped grid, with many interchange opportunities to reach more destinations. Everywhere that two frequent routes cross, a fast interchange is possible; and
- Additional service would be provided at peak hours to limit overcrowding.

As introduced previously, Phase 2 of the Bus Connects Network redesign is being implemented and includes bus Routes **C4**, **L58**, **L59**, **X27**, **X28** and the **C6** night service. The subject site will benefit from an additional orbital Route **W6** which will provide a connection towards Maynooth to the north-west and Tallaght to the south-east. The route will travel via Citywest and will have a frequency of 30 minutes on both weekdays and weekends. **Figure 12.8** below illustrates the Bus Connects proposals in the local area, some of which, as discussed, have already been implemented.

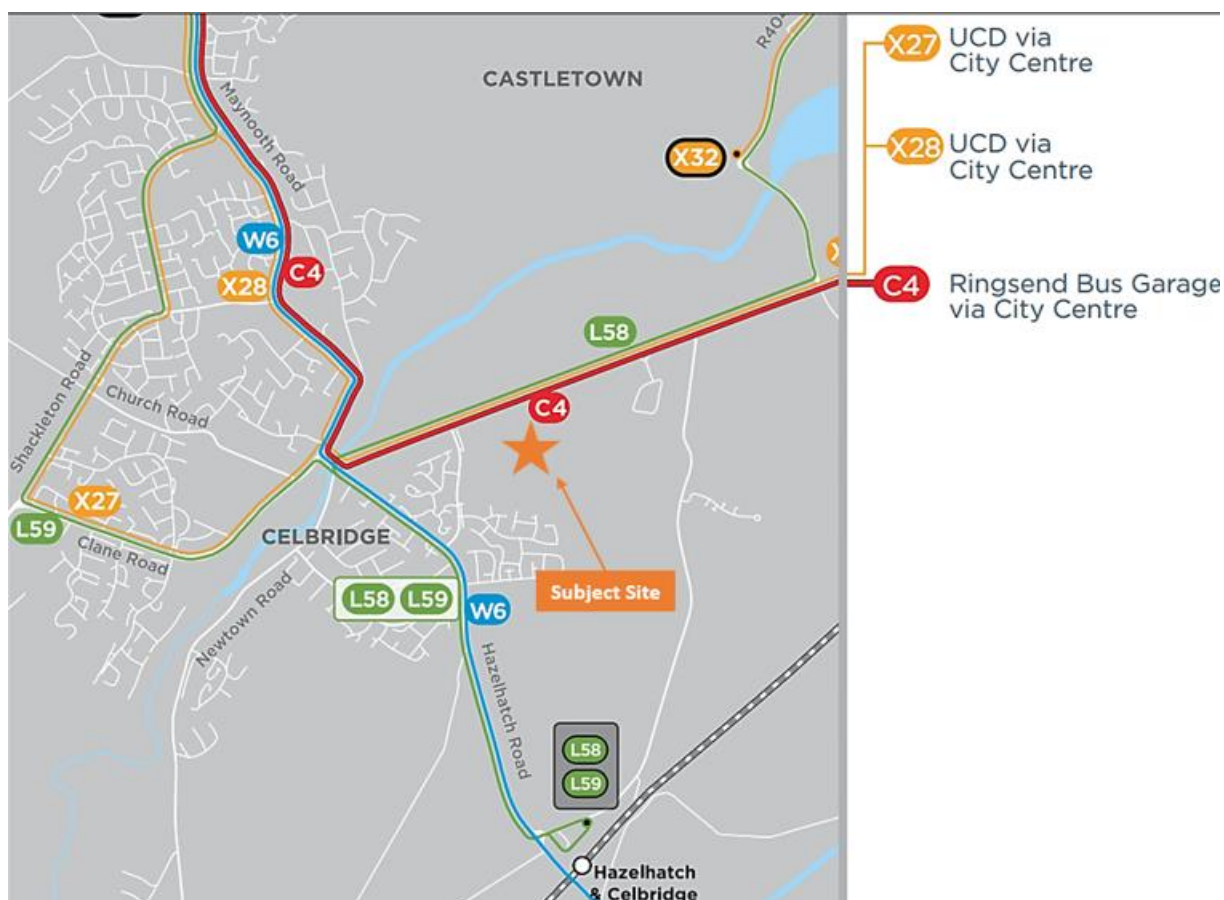


Figure 12.8: Proposed Bus Network (Source: *BusConnects – Revised Network 2020*)

Public Transport Proposals – DART+

The DART+ Programme aims to modernise and improve the existing rail network, which radiates from Dublin City Centre. It will provide a sustainable, electrified, faster, reliable and user-friendly rail system, which increases train frequencies and customer carrying capacity. It intends to increase the length of DART network from the currently 50km to 150km railway corridor through the electrification and upgrade of existing lines transforming commuter train travel in the Greater Dublin Area (GDA). The DART+ Programme also includes the purchase of new train fleet. The DART+ Programme will deliver frequent, modern, electrified services within the GDA and improve connectivity to regional routes as part of the following projects:

- DART+ West - Maynooth and M3 Parkway to the City Centre
- **DART+ South West - Hazelhatch & Celbridge to the City Centre**
- DART+ Coastal North - Drogheda to the City Centre Greystones
- DART+ Coastal South - Greystones to the City Centre

This proposed DART+ South West project (for which 2nd round of a non-statutory public consultation on the preferred option has concluded) will further increase the accessibility of Celbridge and its environs. The project aims to;

- Increase train capacity from the current 12 trains per hour per direction to 23 trains per hour per direction (i.e., maintain the existing 12 services, with an additional 11 train services provided by DART+ South West). This will increase passenger capacity from the current peak capacity of approximately 5,000 passengers per hour per direction to approximately 20,000 passengers per hour per direction.
- Reduce carbon emissions through the deployment of new electric trains.
- Support growing communities, businesses, and future development by providing high-quality integrated public transport services in line with Government policy including the National Planning Framework and Climate Action Plan.

The project aims to cover approx. 20km from Hazelhatch & Celbridge Station to Glasnevin via the Phoenix Park Tunnel Branch Line as illustrated in **Figure 12.9**.



Figure 12.9: DART+ South West Route Map (Source National Transport Authority and Irish Rail)

Road Infrastructure

Kildare County Council have appointed consultants to progress the Celbridge to Hazelhatch Link Road Scheme which incorporates a second bridge crossing across the River Liffey. A preferred route for the scheme has been identified and a non-statutory public consultation has been undertaken which ran between 28th March and 6th May 2022.

The identified preferred route is presented in **Figure 12.10** below. The future implementation of this scheme is expected to significantly relieve the existing peak hour congestion at the existing bridge crossing.

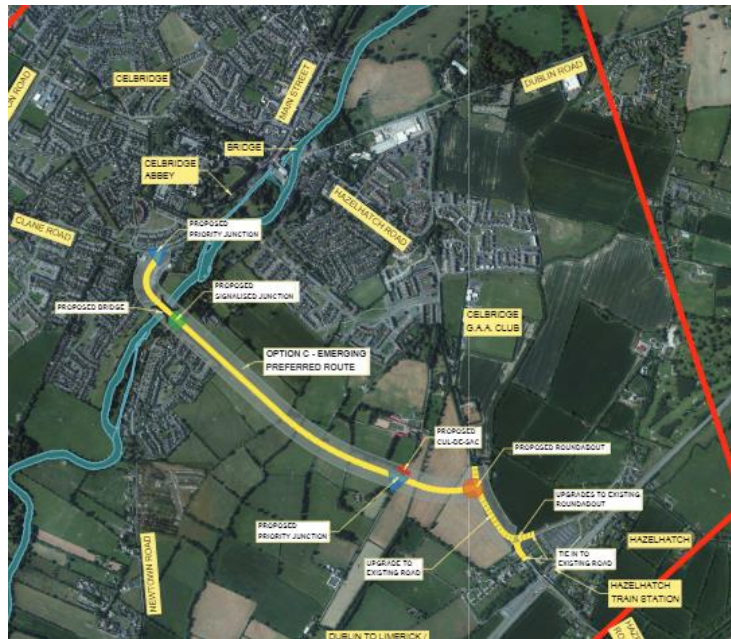


Figure 12.10: Celbridge to Hazelhatch Link Road Preferred Route

Local Area Modal Split

The Central Statistics Office’s SAPMAP (Small Areas Population Map) data has been investigated to determine the travel trends within the local vicinity of the subject residential development. SAPMAP is an interactive mapping tool that allows users to pinpoint a location on the map and access 2016 census data related to that area.

A number of residential developments close to the subject site were analysed to establish current commuter trends in the local area. This analysis will form the basis of the initial travel characteristics that could be generated by the proposed residential development.

Figure 12.11 below illustrates the areas selected for this analysis. These residential sites were selected due to their proximity to the subject site and as such best represents the development’s future travel trends (at least in the short term).

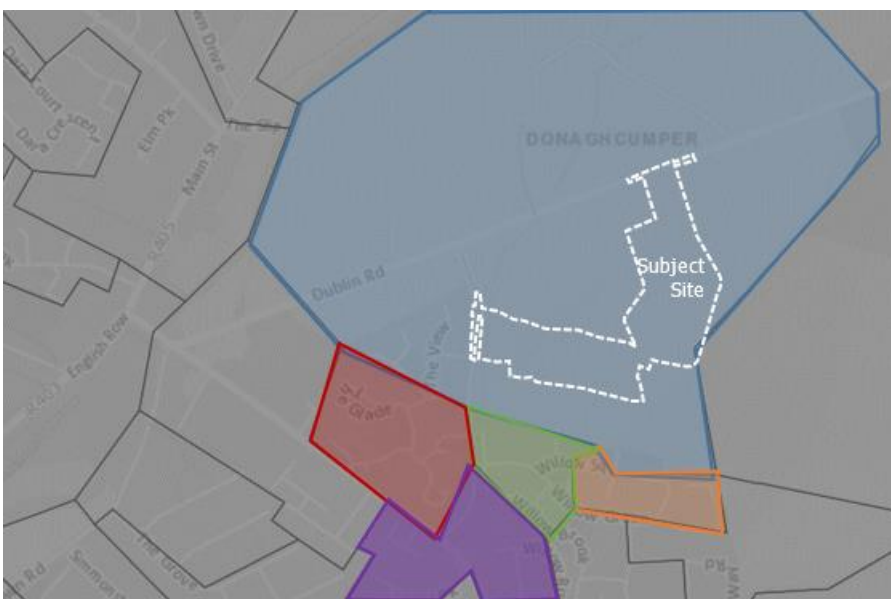


Figure 12.11: Residential Areas of Interest for Trend Analysis

The analysis highlights the existing trend in modes used by the residents when travelling to work, school / college from their homes. The summary of the 2016 data for the aforementioned 5 selected areas are illustrated in **Figure 12.12** below.

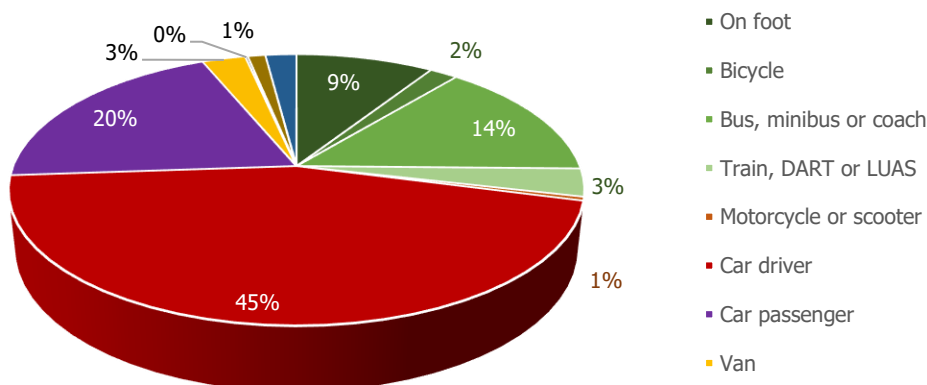


Figure 12.12: 2016 Modal Split for Existing Residential Developments

The above graph indicates that travel by car is the primary mode of transportation in the study area with 65% of residents travelling to work / school / college by car comprising 45% as a car driver and 20% as car passenger. 17% of residents travelling to work / school / college use public transport (14% by bus, 3% by rail). The analysis reveals that 11% of trips are undertaken using active modes of travel whilst active travel comprising 9% on foot and 2% by bicycle.

Baseline Network Traffic Flows

With the objective of establishing the existing up to date local road networks traffic characteristics and subsequently enable the identification of the potential impact by the residential development, traffic surveys were undertaken by the independent specialist survey firm Nationwide Data Collection.

JTCs (Junction Turning Count) were conducted over a 12-hour period from 07:00 to 19:00 on Tuesday 21st September 2021 at the following key junctions;

- JTC 1:** R405 (E) / Main St. R405 (N) / R403 (S) Priority Junction
- JTC 2:** Dublin Rd (R403) (NE) / R405 (SE) / Newtown Rd (S) /R405 (NW) Priority Junction
- JTC 3:** Newtown Rd / Simmonstown Manor Priority Junction.
- JTC 4:** R405 / Hazelhatch Park Access Priority Junction.
- JTC 5:** R405 / Shinkeen Rd Priority Junction.
- JTC 6:** Dublin Rd (R403) / Shinkeen Rd Signalised Junction.
- JTC 7:** Dublin Rd (R403) / Loughlinstown Rd Priority Junction.
- JTC 8:** Dublin Rd (R403) / Stacumny Lane / R404 Signalised Junction.

In addition, Queue Length surveys have been undertaken at JTC locations 1 to 7.

Two automatic turning count (ATC) surveys were also conducted on the Dublin Road and Shinkeen Road corridors in the vicinity of the proposed site access locations.

The surveys undertaken by Nationwide Data Collection established that the local network’s AM and PM peak hours occur between 08:00 – 09:00 and 17:00 – 18:00 respectively. In order to analyse and assess the impact of the proposed development on the surrounding road network, a traffic generation and distribution model (MS Excel based) of the following key junctions was created (as agreed with KCC) as illustrated in **Figure 12.13**.



Figure 12.13: 2016 Modal Split for Existing Residential Developments

12.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development will consist of the construction of 344 no. residential units (comprising 214 no. apartments / duplex units and 130 no. houses), a childcare facility, communal and public open space, landscaping, car and cycle parking spaces, a secondary link street from Dublin Road and Shinkeen Road, including provision of vehicular accesses, associated internal roads, pedestrian and cycle paths, bin storage, public lighting, ESB substations, pumping station and all associated site and infrastructural works.

The proposed site layout has been designed to maximise permeability and connectivity to, through and from the site by foot and by bicycle, as indicated in **Figure 12.14** below. Dedicated cycle and pedestrian facilities are proposed at the two vehicular access junctions on Dublin Road and Shinkeen Road. It is acknowledged that the Celbridge Local Area Plan 2017-2023 identifies an objective for road and footpath improvements along the Dublin Road. To allow for this, the building line along the Dublin Road corridor has been set back to ensure appropriate cycle and pedestrian facilities can be introduced in the future by the Planning Authority. Whilst no scheme has been developed to date by the Planning Authority, this allows for sufficient space that will be compatible with numerous potential future cycle schemes on the Dublin Road corridor. As will be discussed later in this TTA report, a meeting took place between DBFL and KCC Roads / Sustainable Transport departments with the aim of determining the likely future cycle infrastructure along the Dublin Road corridor. The subject site layout incorporates a 2m wide footpath and 2m wide cycle track within the site boundary on the southern side of the Dublin Road corridor. Should an alternative arrangement be preferred, this can be easily incorporated into the subject scheme due to the significant set back proposed at this location. In the interim (before a cycle scheme along the Dublin Road corridor is developed), the proposed cycle and pedestrian link through the subject lands offers a safe and attractive connection between the Dublin Road corridor and existing cycle facilities on Shinkeen Road which in turn link with the Dublin Road corridor.

The proposed cycle facilities on the Shinkeen Road corridor within the subject sites red line boundary will take the form of cycle tracks with dedicated TOUCAN crossings on all arms of the proposed signal controlled junction. The proposed cycle tracks offer additional protection and Quality of Service (as per the National Cycle Manual) to cyclists along this corridor over and above the existing cycle lanes. At the extents of the red line boundary, the proposed cycle tracks will tie-into the existing cycle lane arrangement to the north and south.

For the majority of residents of the proposed development (Sites A & C equating to 80% of units), the most direct and convenient route to Celbridge Town Centre is via the Shinkeen Road corridor as presented in **Figure 12.14** below. This figure compares the distances between a point within Site C and the Shinkeen Road / Dublin Road

junction and illustrated that the route via Shinkeen Road is approx. 106m shorter than the alternative route via the Dublin Road corridor. Accordingly, the subject development is not dependent on the provision of dedicated cycle facilities along the Dublin Road corridor in order to facilitate travel to / from the development site by bicycle

In addition, the proposed development includes pedestrian infrastructure up to the application site boundary to facilitate potential future filtered permeable links with the existing residential settlement of Willow Crescent by way of 2 no. non-vehicular connections, subject to agreement. The subject proposals also provide for the implementation of cycle / pedestrian facilities to the south and east for future connectivity with future development within the KDA2 lands.

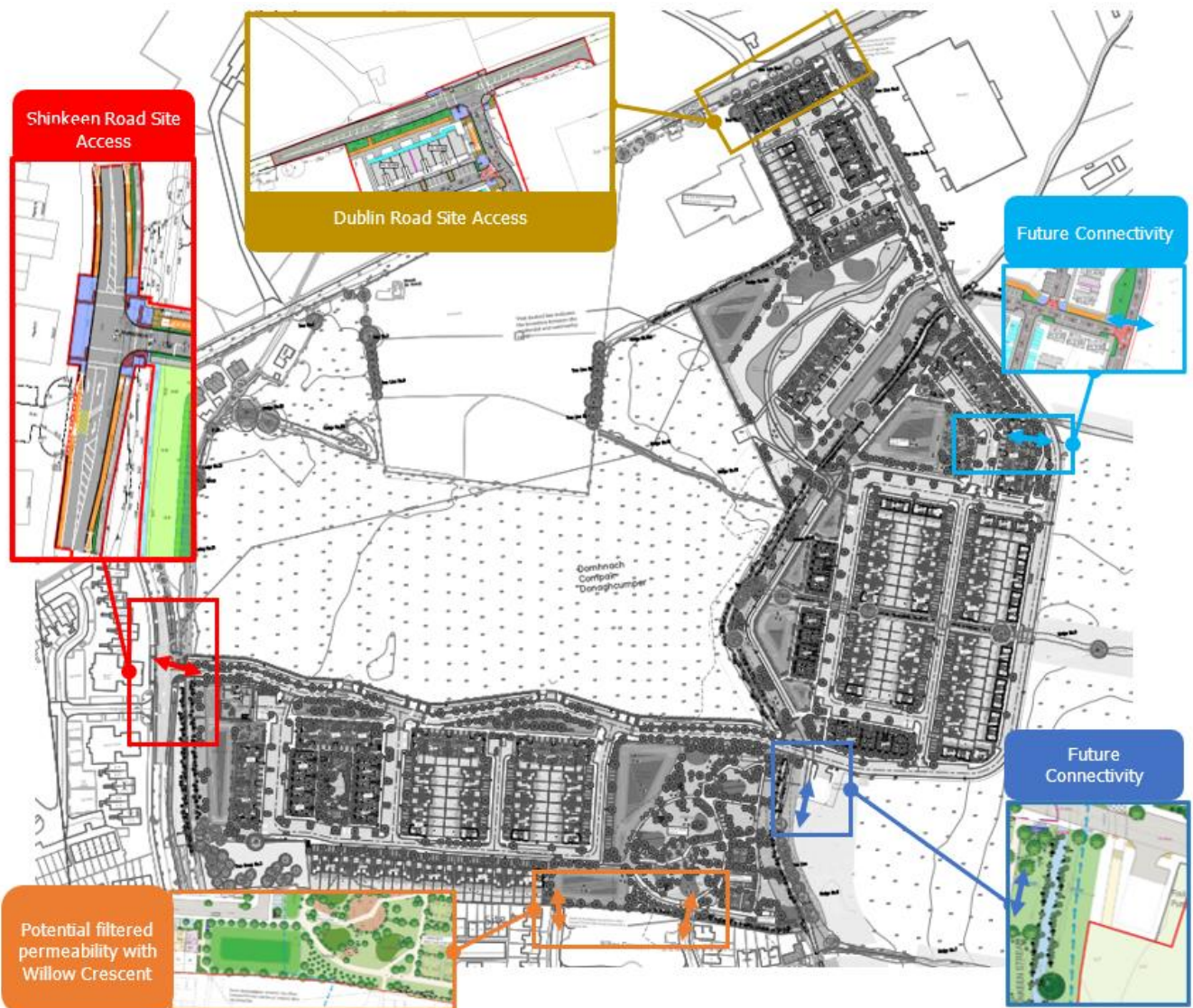


Figure 12.14: Proposed Phase 1 Pedestrian/Cyclist Access Points

The main site access / egress will be via 2 no. new junctions including one on the Shinkeen Road and another on the R403 Dublin Road. Both junctions will take the form of signal controlled junctions as presented in **Figure 12.15** below. These accesses will also accommodate future vehicular access to the schools' site and future residential development on the wider KDA 2 lands. These site access junctions at SHD Planning Stage 2 were designed as priority controlled junctions based on the junction assessment revealing that a priority arrangement had sufficient capacity to cater for the subject development (and future schools traffic). Nevertheless, following a review of the KCC Opinion which recommended upgrading these junctions to be signal controlled, this approach has been incorporated into the scheme proposals.

The proposed location of the Shinkeen Road access junction has been positioned taking cognisance of maximising right turn lane length to allow vehicles turning right into the subject site from Shinkeen Road the ability to store within a dedicated right turn facility thereby maximising capacity for through traffic. The proposed layout has the added benefit of providing a right turn pocket for vehicle drivers wishing to turn right into The View development located on the western side of Shinkeen Road.

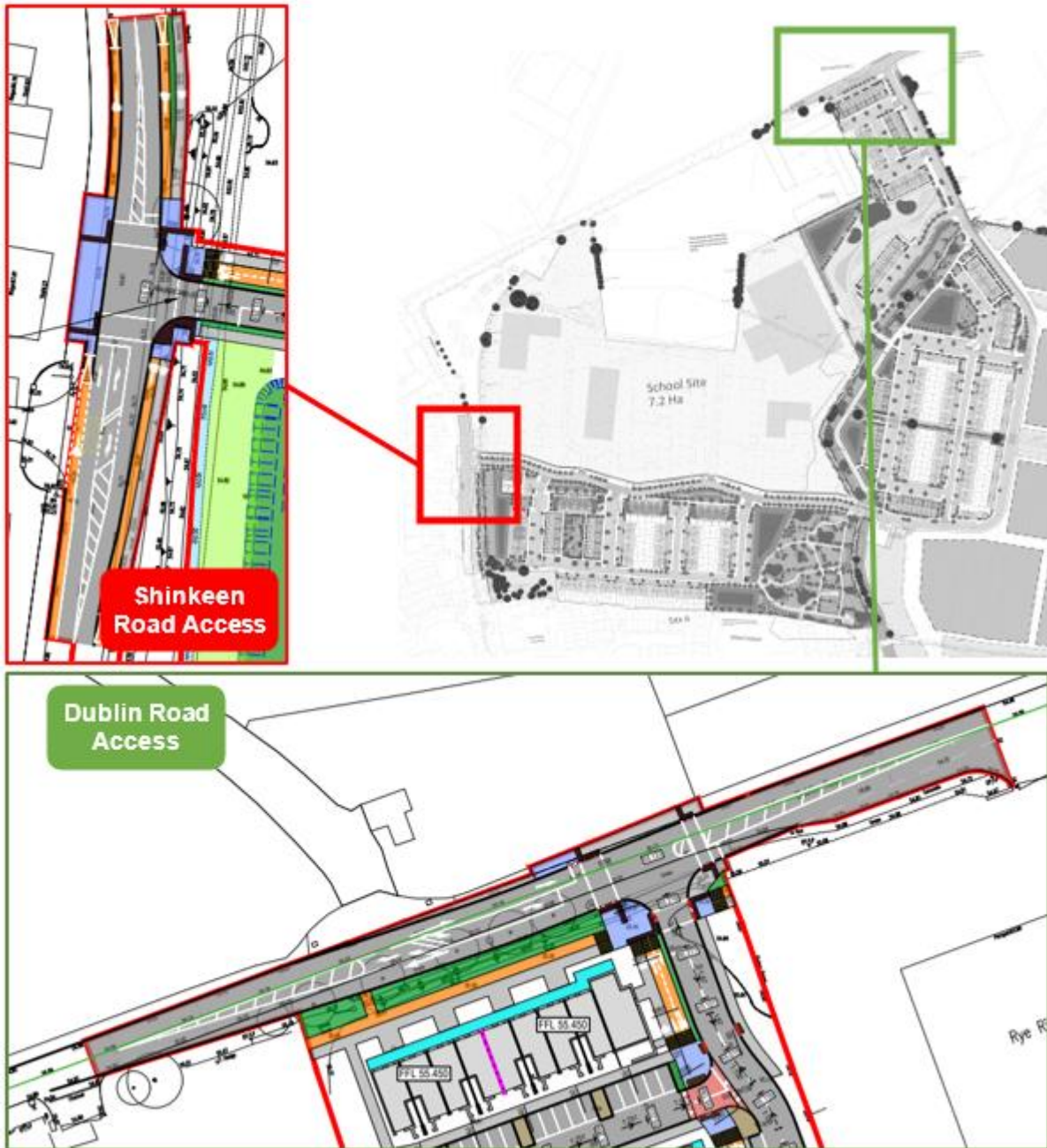


Figure 12.15: Proposed Site Access Junctions

The subject proposals include for the provision of a new 6.5m wide “Local Distributor Road” between the aforementioned site access junctions located on Shinkeen Road and Dublin Road. In addition, provision has been made for 2 no. access locations to the aforementioned schools’ site to the north as well as links to future phases of the KDA2 lands to the east and south.

Dedicated pedestrian footways are proposed along both sides of the corridor with a 2-way cycle track proposed on the northern / western side. The proposed alignment has been designed to comply with the road / pedestrian / cycle objective indicatively illustrated in the Celbridge LAP (Figure 12.16).

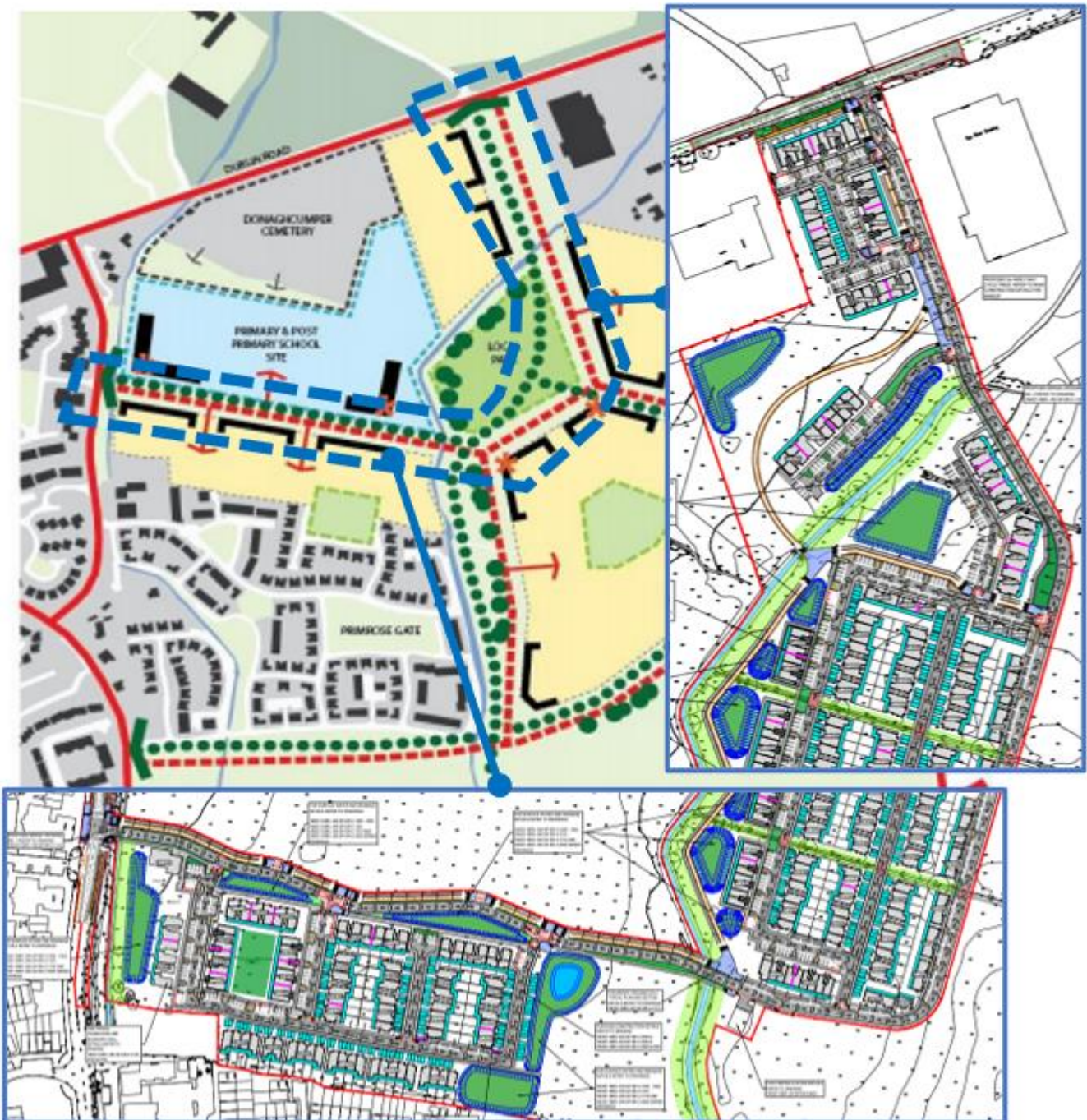


Figure 12.16: Proposed Local Distributor Road

A total of 585 (excluding loading bays) no. car parking spaces are proposed as part of the subject scheme comprising 479 no. resident (inclusive of 5 no. creche staff spaces) and 106 no. visitor car parking spaces (inclusive of 4 no. creche set down spaces). The proposed 106 no. visitor parking spaces equates to 18% of the overall car parking provision. The proposed 585 no. car parking spaces is lower than the development plan requirement of 660 no. spaces (75 no. lower) however the provision of 260 car parking for residents of the houses is fully compliant with the KCC development plan requirement. The provision of 279 no. apartment / duplex car parking spaces, whilst lower than the development plan requirement, is fully compliant (i.e. 2 per unit) with the DHPLG requirement which requires between 268-285 no. car apartment / duplex car parking spaces. Whilst the development plan does not

require visitor parking for house units, a total of 37 no. visitor spaces have been provided comprising 5 no. at site A, 4 no. at Site B and 28 no. at Site C. The 28 no. at Site C are expected to perform a dual purpose for both the houses and visitors to the playground proposed within this area of the site.

In addition to the car parking provision summarised above, a total of 4 no. dedicated loading bay facilities are proposed including 2 no. within Site A, 1 no. within Site B and 1 no. within Site C.

Unit Type	No. of Units	Proposed	
		Visitor	Residents
House	130	37	260
Duplex / Apartment	214	65	214
Creche	497m ²	4	5
Total		585	

Table 12.6: Proposed Car Parking Provision

Whilst the current development plan does not specify a quantum of electric vehicle charging facilities that should be provided for residential schemes, the subject proposals include for the provision of 10% of apartments / duplexes and houses without on-curtilage parking spaces as per national policy. This equates to a total of 36 no. EV car parking spaces. It is expected that residents of the house units which benefit from in-curtilage parking can utilise their private power source for the charging of electric vehicles.

The subject development proposals include for a total of 22 no. disabled car parking spaces. A minimum of 1 disabled space per 25 standard spaces up to the first 100 spaces and 1 disabled space for every 100 spaces thereafter are to be provided. This equates to a minimum of 4 no. disabled car parking spaces (excluding the in-curtilage car parking spaces) within each of the sites plus 1 at the creche. Accordingly, the proposed provision of 22 no. disabled car parking spaces complies with the local development management standards.

The proposals include the provision of a total of 770 no. bicycle parking spaces / opportunities on-site comprising 272 no. short stay spaces and 498 no. long stay spaces / opportunities. The proposed 272 no. short stay cycle parking spaces is significantly higher than the development plan and DHPLG requirements (both require 114 no. short stay spaces). The long stay apartment / duplex cycle parking provision of 238 no. spaces is also higher than the development plan requirement but lower than the DHPLG requirement which require at least 217 no. and 504 no. long stay cycle parking spaces respectively. It is noted that the development plan does not specify a rate of cycle parking for residential house units, nevertheless, the subject proposals include for 2 dedicated spaces within cycle stores per terrace house whilst semi-detached and detached houses with a side access to rear gardens can benefit from cycle parking opportunities on curtilage. In addition, short stay cycle parking has been provided for housing units, by way of Sheffield stands, throughout the subject site at a rate of approx. 1 / 3 houses. Cycle parking for the apartment / duplex units are facilitates by way of one long stay and one short stay space per unit provided on-curtilage with an additional 24 no. long stay apartment spaces within secure bike stores.

It is acknowledged that the long stay cycle parking for the apartment / duplex units does not fully align with the Apartment Guidelines 2020 requirements, however the proposed cycle provision of 452 no. secure bicycle spaces is considered to represent a compromise between the Development Plan requirements (which equates to a requirement of 321 no. spaces) and the Apartment Guidelines 2020 requirements (which equate to a recommendation for 611 no. spaces to be provided). The level of cycle parking provision is considered appropriate and justified in the context of the site location, public transport accessibility, the quantum of car parking proposed, and is supported by the Guidelines which states that *“any deviation from these standards shall be at the discretion of the planning authority and shall be justified with respect to factors such as location, quality of facilities proposed, flexibility for future enhancement/enlargement, etc.”*

A total of 13 no. cycle parking spaces are proposed for the creche which is compliant with the 13 no. required as per the KCC development plan standard.

Unit Type	Proposed	
	Visitor	Residents
House	45	260
Duplex / Apartment	214	238
Creche	13	
Total	770	

Table 12.7: Proposed Cycle Parking Provision

Predicted Trip Generation

It is predicted, particularly in the 2024 Opening Year, that the residents travel mode share will be similar to that illustrated in **Figure 12.12** (local area 2016 Census data). Nevertheless, with the objective of investigating the long term vehicle trip demand that could potentially be generated by the proposed development, trip rates have been derived from the TRICS database for residential developments with similar characteristics to the subject development site. These vehicle trip rates as predicted by TRICS are presented in **Table 12.11** and **12.12** below.

Person Trips

Based on the mode share proportions derived from the Census 2016 data above, the total person trips can be estimated.

It has been assumed that the predicted vehicle trips generated by the subject residential development correspond to the proportion of vehicle trips derived within the Census mode share data. **Table 12.8** below presents the predicted person trips generated by the subject residential development during the AM and PM peak hours.

Mode of Travel	Average Mode Share (%)	AM Peak Hour		PM Peak Hour	
		Arr	Dep	Arr	Dep
On Foot	9.1%	6	20	20	11
Bicycle	1.9%	1	4	4	2
Bus, minibus or coach	14.3 %	10	31	31	18
Train	3.3%	2	7	7	4
Motorcycle or scooter	0.4%	0	1	1	1
Car driver	44.8%	31	97	96	56
Car Passenger	19.8%	14	43	43	25
Van	2.9%	2	6	6	4
Total Person Trips		69	216	215	125

Table 12.8: Proposed Residential Predicted Person Trips

Sustainable Travel Based Trips

In reference to the baseline modal split data presented in **Table 12.8** (Census Data) for the local area, it has been possible to estimate the number of trips undertaken by sustainable modes of travel that the proposed development could generate in the peak travel periods i.e. (0600-1000 in the AM and 1600-2000 in the PM). The predicted AM and PM peak period trips are presented in **Table 12.9** below.

Peak Period	PT Rail Trips	PT Bus Trips	Cycling	Walking
AM (06:00-10:00)	23	98	14	63
PM (16:00-20:00)	35	146	21	94

Table 12.9: Potential Two-Way Development Trips by Sustainable Modes of Travel

Proposed Development Vehicle Trips

To estimate the potential level of vehicle trips that could be generated by the proposed residential development, reference has been made to the TRICS database. TRICS provides trip rate information for a variety of different land uses and development types, which can be applied to the subject development.

Table 12.10 below includes the predicted trip rates for the proposed development during the morning and evening peak hour periods using data from TRICS.

Based on these trip rates, potential peak hour vehicle traffic flow has been calculated for the proposed development. For the purposes of the subject traffic assessment it has been assumed that, by the end of the adopted 2024 Opening Year, Phase 1 of the proposed development will be complete which includes all units within Site A (i.e. 80 no. apartments / duplexes, 51 no. houses and creche). However in reality, this could roll into 2025 allowing for unforeseen circumstances.

Land Use	No. Units / GFA	AM Peak Hour (07:45-08:45)			PM Peak Hour (17:00 - 18:00)		
		Arr	Dep	Two-Way	Arr	Dep	Two-Way
House	130	0.172	0.510	0.682	0.423	0.266	0.689
Apartments / Duplex / Maisonette	214	0.041	0.142	0.183	0.193	0.101	0.294
Creche	497 sq.m	4.78	3.46	8.24	3.26	4.25	7.51

Table 12.10: Proposed Development Trip Rates (TRICS)

It has been assumed that the vast majority of creche trips would be internal (i.e., trips generated by the residents themselves) whilst a small proportion of the trips would be external or 'new' (i.e., creche trips from outside the development). Accordingly, the creche TRICS derived trips rates have been discounted by a factor of 40% to account for this.

Table 12.11 below summarises the predicted AM and PM peak hour traffic generated by the proposed development.

Land Use	No. Units / GFA	AM Peak Hour (07:45-08:45)			PM Peak Hour (17:00 - 18:00)		
		Arr	Dep	Two-Way	Arr	Dep	Two-Way
Apartments / Duplexes	80	3	11	15	15	8	24
Houses	51	9	26	35	22	14	36
Creche	497 sq.m	14*	10*	25*	104*	13*	22*
Total		23	36	60	31	26	58

*Creche Trips discounted by 40%

Table 12.11: Proposed Development Potential Vehicle Trips – 2024 Opening Year

By the 2029 Future Design Year, it has been assumed that the remaining residential units within Phase 1 could be complete and occupied. The total Phase 1 potential vehicle trip generation is summarised in **Table 12.12** below.

Land Use	No. Units / GFA	AM Peak Hour (07:45-08:45)			PM Peak Hour (17:00 - 18:00)		
		Arr	Dep	Two-Way	Arr	Dep	Two-Way
Apartment / Duplex /	220	9	31	40	42	22	65
Houses	130	21	63	84	52	33	85
Creche	497 sq.m	14*	10*	25*	104*	13*	22*
Total		45	107	152	106	69	175

Table 12.12: Proposed Development Potential Vehicle Trips – 2029 Future Design Year Onwards

12.5 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

Construction Phase

All construction activities will be governed by a Construction Traffic Management Plan (CTMP) which will implement the mitigation measures identified in this Section 12.8 of this EIAR Chapter and as summarised within the Preliminary Construction & Environmental Management Plan which accompanies this planning application. The principal objective of the CTMP is to ensure that the impacts of all building activities generated during the construction of the proposed development upon both the public (off-site) and internal (on-site) workers environments, are fully considered and proactively managed / programmed respecting key stakeholders requirements thereby ensuring that both the public' and construction workers' safety is maintained at all times, disruptions are minimised and undertaken within a controlled hazard free environment. It is noted that the impact of the construction works will be temporary in nature.

Construction Access and Phasing: For the purposes of the traffic & transport assessment it is assumed that Phase 1 of the development will be complete and operational by the end of the adopted 2024 Opening Year however in reality, this could roll into 2025 allowing for unforeseen circumstances. The main construction access will be agreed with KCC in advance of construction but it could be located at the proposed access on the Dublin Road corridor.

Construction Activity: The period (time of day and day of week) during which construction activities will be permitted on-site, and during which construction traffic will be travelling across the local road network are set out in the detailed Construction and Environmental Management Plan. This includes works between the hours of 07:00 to 18:00 Monday to Friday (excluding bank holidays) and 08:00-15:00 on Saturdays with no construction activities on Sundays and Bank Holidays.

Construction Traffic Generation: During the general excavation of the foundations there will be additional HGV movements to and from the site. Utilising typical construction rates, it is predicted that, during the excavation stage, there could be 2 no. truckloads per hour equating to 4 no. two-way HGV movements per hour. Assuming a 10 hour working day, this equates to 40 no. two-way HGV movements per day on the local road network. All suitable material will be reused for construction and fill activities where possible and appropriate. All spoil material will be removed to a registered landfill site in consultation with the local authority. In addition to the traffic generated by the disposal of surplus subsoil from the site, there will be traffic generated from construction staff and deliveries of construction materials and equipment.

On-site employees will generally arrive before 08:00, thus avoiding the morning peak hour traffic. These employees will generally depart after 18:00. It should be noted that a large proportion of construction workers would arrive in shared transport. It is assumed that approximately 140 no. construction staff could be working on-site on a typical day. It is further assumed that 5% of these will travel by private car as single vehicle occupants, 70% car share (assuming 3 staff per car) and a further 25% by minibus / public transport / set down. Accordingly, approx. on-site construction staff could generate up to 40 no. inbound and outbound car trips daily plus 21 staff travelling by minibus, public transport or dropped off locally.

Construction Traffic Routing: The proposed construction ‘haul’ route will be via the primary road network between the subject lands and the M4 strategic road network. Furthermore, the identified ‘haul’ routes, will respect local accessibility characteristics. The potential route from the M4 could be via Junction 5 and subsequently via the R403 Dublin Road road corridor. Accordingly, any potential impact as a result construction traffic on Celbridge Town Centre will be minimised.

Construction Traffic Vehicle Types: Construction traffic will consist of the following two principal categories. (i) Private vehicles owned and driven by site construction staff and by full time supervisory staff. On-site employees will generally arrive before 08:00, thus avoiding the morning peak hour traffic. These employees will generally depart after 18:00. It should be noted that a large proportion of construction workers would arrive in shared transport or use public transport. (ii) Excavation plant and dumper trucks involved in site development works and material delivery vehicles for the following: granular fill materials, concrete pipes, manholes, reinforcement steel, ready-mix concrete and mortar, concrete blocks, miscellaneous building materials, etc.

Construction Traffic Impact: The predicted construction HGV and staff vehicle generation levels as summarised above (including potential impact on the haul route) are lower than those predicted during the operational stage. The impact at construction stage (which will be discussed in more detail in the following Section) is predicted to be imperceptible to not significant and therefore the lower vehicular traffic generated at construction stage is predicted to have a lesser impact compare to the operational stage. In addition, the peak construction stage traffic will occur before the local road networks AM peak hour (08:00-09:00) and after the PM peak hour (17:00-18:00). Outside of peak network hour times, the local junctions and road links will have significantly more capacity compared to the peak hours and therefore are predicted to have more than enough capacity to accommodate the predicted construction vehicular traffic generation. The level of significance of the above findings are categorised in **Table 12.13**.

Description	Quality of Impact	Impact Significance	Duration
HGV Traffic	Negative	Not Significant	Short-term
Dust generation	Negative	Not Significant	Short-term
Noise & Vibration	Negative	Not Significant	Short-term
Parking	Neutral	Imperceptible	Short-term

Table 12.13: Summary of Potential Construction Stage Impact

Operational Phase

Road Network Impact

Table 12.14 details the specific scale of network impact predicted at each of the key local junctions during the 2024, 2029 and 2039 design years as a result of the subject Phase 1 development proposals. For the all key off-site junctions, it can be seen that the proposed development would have sub-threshold impacts (i.e. <5% or 10%). Due to the redistribution of base traffic, slight improvements in the operation of the Dublin Road / Shinkeen Road signal-controlled junction are predicted. However, as expected, significant impacts are predicted at the 2 no. site access locations and therefore, these junctions will be subject to more detailed assessment.

Junction No.	Junction	Design Year	Percentage Impact	
			AM	PM
1	Proposed Access 1 (Shinkeen Rd)	2024	4.64%	4.42%
		2029	10.98%	12.40%
		2039	10.10%	11.41%
2	Proposed Access 2 (Dublin Rd)	2024	3.26%	3.00%
		2029	7.72%	8.43%
		2039	7.11%	7.76%
3	R405/Shinkeen Rd Junction	2024	1.15%	1.09%

Junction No.	Junction	Design Year	Percentage Impact	
			AM	PM
4	Dublin Rd (R403)/Shinkeen Rd Junction	2029	2.73%	3.06%
		2039	2.53%	2.83%
		2024	-5.49%	-1.83%
5	Dublin Rd (R403)/Stacumny Lane/R404 Signalised Junction	2029	-3.18%	1.08%
		2039	-3.51%	0.71%
		2024	1.80%	1.63%
6	Dublin Rd (R403)/Loughlinstown Rd Junction	2029	3.87%	4.53%
		2039	3.59%	4.18%
		2024	2.23%	1.93%
7	R405/Willow Avenue Junction	2029	5.30%	5.43%
		2039	4.88%	4.99%
		2024	1.21%	1.11%
8	R405/Hazelhatch Park Access	2029	2.88%	3.12%
		2039	2.66%	2.88%
		2024	1.05%	1.00%
9	Newtown Rd/Simmonstown Manor	2029	2.51%	2.80%
		2039	2.32%	2.59%
		2024	0.41%	0.37%
10	Dublin Rd (R403)/R405 (E)/Newtown Rd/R405 (W)	2029	0.97%	1.05%
		2039	0.89%	0.96%
		2024	1.00%	0.95%
11	R405 (E)/Main St. R405 (N)/R403 (S)	2029	2.39%	2.68%
		2039	2.21%	2.48%
		2024	0.90%	0.83%
		2029	2.15%	2.35%
		2039	1.99%	2.17%
		2024		

Table 12.14: Network Impact Through Key Off Site Junctions

In **Table 12.15** (AM Peak Hour) and **Table 12.16** (PM Peak Hour) the predicted impacts have been categorised for the 2039 Future Design Year.

Table 12.15 reveals that, during the AM peak hour, the impact significance of the subject proposals are categorised as Imperceptible to Not Significant at all key off-site junctions. At the future site access locations, the impacts are classified as Slight to Moderate.

Junction - Nature of Impact		Impact Scale	Impact Significance	Impact Effect
1	Proposed Access 1 (Shinkeen Rd)	10.10%	Moderate	Negative
2	Proposed Access 2 (Dublin Rd)	7.11%	Slight	Negative
3	R405/Shinkeen Rd Junction	2.53%	Not Significant	Negative
4	Dublin Rd (R403)/Shinkeen Rd Junction	-3.51%	Not Significant	Positive
5	Dublin Rd (R403)/Stacumny Lane/R404 Signalised Junction	3.59%	Not Significant	Negative

Junction - Nature of Impact		Impact Scale	Impact Significance	Impact Effect
6	Dublin Rd (R403)/Loughlinstown Rd Junction	4.88%	Not Significant	Negative
7	R405/Willow Avenue Junction	2.66%	Not Significant	Negative
8	R405/Hazelhatch Park Access	2.32%	Imperceptible	Negative
9	Newtown Rd/Simmonstown Manor	0.89%	Imperceptible	Negative
10	Dublin Rd (R403)/R405 (E)/Newtown Rd/R405 (W)	2.21%	Imperceptible	Negative
11	R405 (E)/Main St. R405 (N)/R403 (S)	1.99%	Imperceptible	Negative

Table 12.15: Network Impact Categorisation 2039 AM Peak Hour

Similarly, during the PM peak hour, the impact significance of the subject proposals are categorised as Imperceptible to Not Significant at all key off-site junctions. At the future site access locations, the impacts are again classified as Slight to Moderate.

Junction - Nature of Impact (Additional Vehicular Traffic on key Junctions)		Impact Scale	Impact Significance	Impact Effect
1	Proposed Access 1 (Shinkeen Rd)	11.41%	Moderate	Negative
2	Proposed Access 2 (Dublin Rd)	7.76%	Slight	Negative
3	R405/Shinkeen Rd Junction	2.83%	Not Significant	Negative
4	Dublin Rd (R403)/Shinkeen Rd Junction	0.71%	Imperceptible	Negative
5	Dublin Rd (R403)/Stacumny Lane/R404 Signalised Junction	4.18%	Not Significant	Negative
6	Dublin Rd (R403)/Loughlinstown Rd Junction	4.99%	Not Significant	Negative
7	R405/Willow Avenue Junction	2.88%	Not Significant	Negative
8	R405/Hazelhatch Park Access	2.59%	Not Significant	Negative
9	Newtown Rd/Simmonstown Manor	0.96%	Imperceptible	Negative
10	Dublin Rd (R403)/R405 (E)/Newtown Rd/R405 (W)	2.48%	Not Significant	Negative
11	R405 (E)/Main St. R405 (N)/R403 (S)	2.17%	Imperceptible	Negative

Table 12.16: Network Impact Categorisation 2039 PM Peak Hour

Network Assessment

The operational assessment of the proposed new junctions on the Shinkeen Road and Dublin Road corridors has been undertaken using the Transport Research Laboratory (TRL) computer package TRANSYT for the proposed signal controlled junctions.

When considering signal controlled junctions, a Degree of Saturation (DoS) of greater than 90% would indicate a junction to be approaching capacity, as operation above this RFC value is poor and deteriorates quickly.

For the TRANSYT analyses a 60-minute AM and PM period has been simulated, from 08:00 to 09:00 and 17:00 to 18:00, respectively. For the TRANSYT analyses traffic flows were entered using an Origin-Destination table for the peak hours

The results of the operational assessment of the proposed access on Shinkeen Road during the weekday morning and evening peaks “Do-Something” scenarios has been summarised in **Table 12.17** below. The three arms were labelled as follows within the TRANSYT model:

- Arm A: Shinkeen Road (N)
- Arm B: Site Access (E)
- Arm C: Shinkeen Road (S)

The TRANSYT results (**Table 12.17**) indicate that the new signal controlled junction on Shinkeen Road will operate with significant reserve capacity during the AM peak hour with a maximum DoS (Degree of Saturation) of 43% and a maximum MMQ (Mean Max Queue) of 6.43 pcu being recorded during the 2039 Future Design Year scenario. For the corresponding PM peak hour, a maximum DoS of 39% and a maximum MMQ of 5.75 pcu is recorded during the 2039 Future Design Year scenario implying significant reserve capacity.

Scenario	Period	Arm	DoS	Delay (s)	MMQ
DS 2024	AM Peak	A	16	8.29	2.04
		B	28	48.28	1.13
		C	33	4.22	4.73
	PM Peak	A	20	9.09	2.73
		B	35	50.38	1.43
		C	29	4.26	4.12
DS 2029	AM Peak	A	18	9.79	2.43
		B	42	49.34	2.08
		C	37	5.29	5.66
	PM Peak	A	24	10.36	3.41
		B	41	48.98	2.02
		C	34	5.36	5.09
DS 2039	AM Peak	A	20	9.93	2.69
		B	43	49.70	2.17
		C	41	6.22	6.43
	PM Peak	A	27	11.06	3.83
		B	39	47.11	2.09
		C	37	6.22	5.75

Table 12.17: TRANSYT “Do-Something” Analysis for Shinkeen Road Access

The results of the operational assessment of the proposed access on Dublin Road (R403) during the weekday morning and evening peaks “Do-Something” scenarios have been summarised in **Table 12.18** below. The three arms were labelled as follows within the TRANSYT model:

- Arm A: Dublin Road (E)
- Arm B: Access (S)
- Arm C: Dublin Road (W)

The TRANSYT results (**Table 12.18**) indicate that the Dublin Road access junction will operate with significant reserve capacity during the AM peak hour with a maximum DoS of 67% and a maximum MMQ of 13.96 pcu being recorded during the 2039 Future Design Year scenario.

For the corresponding PM peak hour, a maximum DoS of 68% and a maximum MMQ of 14.46 pcu being recorded during the 2039 Future Design Year scenario implying significant reserve capacity.

Scenario	Period	Arm	DoS	Delay (s)	MMQ
DS 2024	AM Peak	A	36	9.70	5.36
		B	47	51.14	2.39
		C	53	7.43	9.21
	PM Peak	A	56	10.56	10.06
		B	13	44.68	0.50
		C	40	4.70	5.89
DS 2029	AM Peak	A	41	11.24	6.47
		B	55	50.07	3.67
		C	60	10.12	11.75
	PM Peak	A	63	12.03	12.64
		B	30	48.68	1.19
		C	44	5.23	6.68
DS 2039	AM Peak	A	44	5.23	6.68
		B	54	48.11	3.75
		C	67	12.21	13.96
	PM Peak	A	68	13.24	14.46
		B	30	48.68	1.19
		C	47	5.80	7.60

**Table 12.18: TRANSYT “Do-Something” Analysis for Dublin Road Access
Potential Non-Vehicular Network Impact**

Based on the estimated number of trips undertaken by sustainable modes of travel that the proposed development could generate in the peak travel periods i.e. (0600-1000 in the AM and 1600-2000 in the PM) as presented in **Table 12.9** of this Chapter, the following section establishes the scale of impact that the proposed development is predicted to generate upon the existing public transport network and quantifies the capacity of the public transport network to accommodate the proposed development.

In reference to **Table 12.9**, **Table 12.19** below establishes that the additional bus trips that the proposed development is predicted to generate amounts to only 1.6% and 2.3% of the total bus transport network capacity available during the morning (0600-1000) and evening (1600-2000) peak periods respectively. The additional rail

trips that the proposed development is predicted to generate amounts to only 0.3% and 0.6% of the total rail transport network capacity (serving Hazelhatch & Celbridge) available during the morning (0600-1000) and evening (1600-2000) peak periods respectively.

Period	Mode	Existing Two-Way Capacity	Additional Trips	Scale of Impact (%)
AM	Bus	6244	98	1.6%
	Train	6812	23	0.3%
	Total	12600	121	0.9%
PM	Bus	6356	146	2.3%
	Train	6288	35	0.6%
	Total	13100	181	1.4%

Table 12.18: Predicted Phase 1 Residential Developments Public Transport Network Impact

A summary of the potential impacts on traffic and transportation before the introduction of any mitigation measures is summarised in **Table 12.19** below. The quality of impact on active travel modes are characterised as positive due to the proposed improvements in cycle and pedestrian infrastructure being proposed as part of this development. Whilst a reduction in traffic movements is predicted at the Dublin Road / Shinkeen Road junction, the quality of impact of traffic has been categorised as negative due to the modest negative impact at other key off-site junctions.

Node Ref.	Quality of Impact	Impact Significance	Duration
Traffic	Negative	Not Significant	Long Term
Pedestrian Network	Positive	Significant	Long Term
Cycling Network	Positive	Significant	Long Term
Public Transport	Negative	Not Significant	Long Term

Table 12.19 – Summary of Potential Impact

12.6 POTENTIAL CUMULATIVE IMPACTS

With the objective of assessing the cumulative impacts the potential traffic that could arise from committed development schemes in the local area in addition to growth factors applied to base traffic flows have been incorporated into the analysis in Section 12.5 which ensures the cumulative impact of potential additional vehicular movements as a result of the implementation of both the subject proposals and the committed development have been assessed.

A total of three number third party committed developments have been identified, which being located in close proximity to the proposed residential development, may generate an impact upon the local road networks existing traffic characteristics. These include: -

Oldtown Residential Development (Ref: ABP-303295-18)

The Oldtown residential development (ABP Ref. No. ABP-303295-18) is located at the western end of Celbridge. It is bounded to the north by Oldtown Road and to the east by Shackleton Road. The development consists of 251 no. residential units comprising 167 no. houses, 84 no. apartments and a creche.

Also included is the upgrading of the existing junction at the corner of Shackleton Road and Oldtown Road to accommodate a new filter lane and crossing point; and the provision of new vehicular entrance onto Shackleton Road and two new vehicular entrances onto Oldtown Road. Planning was granted, with conditions, in April of 2019 and as of October 2021, several houses have been occupied.

The vehicle trips associated with this committed development were retrieved from the Traffic and Transport Assessment submitted as part of the development's planning application. These vehicle trips were included in the subject development's Traffic Model in order to assess the impact of the Ballyoulster development on the surrounding network in addition to the subject development's impact. **Table 12.20** below summarises the peak hour AM and PM traffic generated by the committed residential development.

No. Units	AM Peak Hour (07:45-08:45)			PM Peak Hour (17:00 - 18:00)		
	Arr	Dep	Two-Way	Arr	Dep	Two-Way
251	17	67	84	49	27	76

Table 12.20: Committed Development (Ref: ABP-303295-18) Traffic Generation

Residential Development at Crodaun, Celbridge (Ref: ABP-306504-20 & 309361-21)

The committed residential development at Crodaun (ABP Ref. No. ABP-306504-20 & 309361-21) is located to the north of Celbridge Town Centre. The development consists of 372 (reduced to 352 as part of amendment) no. residential units.

The vehicle trips associated with this committed development were retrieved from the Traffic and Transport Assessment submitted as part of the development's planning application. These vehicle trips were included in the subject development's Traffic Model in order to assess the impact of the Ballyoulster development on the surrounding network in addition to the subject development's impact. **Table 12.21** below summarises the peak hour AM and PM traffic generated by this committed residential development.

No. Units	AM Peak Hour (07:45-08:45)			PM Peak Hour (17:00 - 18:00)		
	Arr	Dep	Two-Way	Arr	Dep	Two-Way
272	39	125	163	84	51	135

Table 12.21: Committed Development (Ref: ABP-306504-20 & 309361-21) Traffic Generation

Residential Development at Crodaun, Celbridge (Ref: ABP-307100-20)

The committed residential development at Crodaun (ABP Ref. No. ABP-307100-20) is located to the north of Celbridge Town Centre. The development consists of 467 no. residential units.

The vehicle trips associated with this committed development were retrieved from the Traffic and Transport Assessment submitted as part of the development's planning application. These vehicle trips were included in the subject development's Traffic Model in order to assess the impact of the Ballyoulster development on the surrounding network in addition to the subject development's impact. **Table 12.22** below summarises the peak hour AM and PM traffic generated by this committed residential development.

No. Units	AM Peak Hour (07:45-08:45)			PM Peak Hour (17:00 - 18:00)		
	Arr	Dep	Two-Way	Arr	Dep	Two-Way
467	73	174	247	165	92	257

Table 12.22: Committed Development (Ref: ABP-307100-20) Traffic Generation

Future / Planned Transport Improvements

Kildare County Council have appointed consultants to progress the Celbridge to Hazelhatch Link Road Scheme which incorporates a second bridge crossing across the River Liffey. A preferred route for the scheme has been identified and a non-statutory public consultation has been undertaken which ran between 28th March and 6th May 2022. Whilst not an essential piece of infrastructure for the delivery of the subject development proposals, the future

implementation of this scheme is expected to significantly relieve the existing peak hour congestion at the existing bridge crossing in Celbridge Town Centre and be of benefit to existing and future residents.

12.7 'DO NOTHING' IMPACT

The proposed development site is greenfield and generates no traffic. In the absence of the proposed development, the overall operational performance of the existing junctions on the surrounding road network will be affected by the impact caused by committed development and forecast background network traffic growth (should that growth arise). Nevertheless, it is also noted that the subject lands are zoned 'C: New Residential'. Accordingly, in the absence of the subject development, a development of a similar nature would likely be progressed on the subject development lands in the short to medium term and it is anticipated that the impact would be similar to this proposal.

12.8 AVOIDANCE, REMEDIAL & MITIGATION MEASURES

Construction Phase

T&T CONST 1: Construction & Environmental Management Plan and Construction Traffic Management

- The Construction & Environmental Management Plan (a preliminary CEMP accompanies the application) and the associated Construction Traffic Management Plan (CTMP) in addition to the Resource (Construction) Waste Management Plan for the development will incorporate a range of integrated control measures and associated management initiatives with the objective of mitigating the impact of the proposed developments on-site construction activities
- All construction related parking will be provided on site. Construction traffic will consist of the following categories: -
 - Private vehicles owned and driven by site construction staff and by full time supervisory staff. The proposed on-site car parking area will be designed to have the capacity to accommodate this parking demand in addition to an element of visitor parking spaces
 - Excavation plant and dumper trucks involved in site development works and material delivery vehicles for the following: granular fill materials, concrete pipes, manholes, reinforcement steel, ready mix concrete and mortar, concrete blocks, miscellaneous building materials, etc
- On-site employees will generally arrive before 08:00, thus avoiding morning peak hour traffic. These employees will generally depart after 18:00 and avoid the PM peak hour
- To minimise disruption to the surrounding environment, the following mitigation measures will be implemented;
 - During the pre-construction phase, the site will be securely fenced off from adjacent properties, public footpaths and roads.
 - All road works will be adequately signposted and enclosed to ensure the safety of all road users and construction personnel.
 - A dedicated 'construction' site access / egress junction will be provided during all construction phases.
 - Provision of sufficient on-site parking for staff and visitors (as described above) and compounding through the construction of temporary hardstanding areas to ensure no potential overflow of construction generated traffic onto the local network.
 - A material storage zone will also be provided in the compound area. This storage zone will include material recycling areas and facilities.
 - A series of 'way finding' signage will be provided to route staff / deliveries into the site and to designated compound / construction areas.
 - A dedicated construction haul route has been identified and will be agreed with the local authority prior to the commencement of constructions activities on-site.
 - Truck wheel washes will be installed at construction and discharge from wheel wash area will be directed to on-site settlement ponds.
 - On completion of the works all construction materials, debris, temporary hardstands etc. from the site compound will be removed off site and the site compound area reinstated in full on completion of the works

Operational Phase

T&T OPERA 1: Mobility Management

A Mobility Management Plan (MMP) is included with the application. The measures identified in the MMP form part of the specific mitigation of this EIAR and a dedicated resident specific Mobility Management Plan (MMP) is to be compiled with the aim of guiding the delivery and management of coordinated initiatives by the scheme promoter. Resident specific MMPs include specialised plans and associated implementation strategies for the subject development proposals. The MMP ultimately seeks to encourage sustainable travel practices for all journeys by residents and visitors traveling to and from the proposed development. It involves the incorporation of a wide range of possible “hard” and “soft” tools from which to choose from with the objective of influencing travel choices.

T&T OPERA 2: Infrastructure

The delivery of a through route between Dublin Road corridor and Shinkeen Road corridor will provide an alternative routing option between origins / destinations to the north / east negating the need to travel via the Dublin Road / Shinkeen Road junction. This will help improve the operational performance of the existing Dublin Road / Shinkeen Road junction.

T&T OPERA 3: Permeability

The proposed scheme design incorporates the LAP objectives of ‘Green Links’ through the site for the benefit of pedestrians and cyclists. The implementation of dedicated infrastructure along an integrated area wide catchment provides an attractive, convenient, seamless ‘green’ corridor providing a permeable, safe connection between existing (and future) residential neighbouring’s.

12.9 MONITORING

The mobility management plan of the development will be monitored and updated every year (as per the KCC Opinion) over a period of 10 years from the initial occupancy of the units. This will allow the progress made towards achieving mode split targets to be tracked and updated as necessary. The information obtained from the monitoring surveys will be used to identify ways in which the MMP initiatives should be taken forward in order to maintain and further encourage sustainable travel characteristics. A specific aim of the MMP is to reduce the number of trips by private car. Accordingly, an objective of the MMP is to reduce travel by private car by 15% compared to the Opening Year mode share. The 15% reduction in car travel amongst residents shall reassign to more sustainable modes of travel including walking, cycling and public transport.

12.10 REINSTATEMENT

Reinstatement is not applicable to the Traffic and Transportation Section of this EIAR because it not planned to reinstate the land as this is a permanent development.

12.11 INTERACTIONS

Accidents and Disasters

Construction Phase

During the construction stage, the risk of accidents associated with the proposed development are not predicted to cause unusual, significant or adverse effects to the existing public road network. The vast majority of the works are away from the public road in a controlled environment. Measures (as described in the mitigation measures above) will be put in place to minimise the risk of road traffic accidents during the construction phase. Furthermore, is expected that the risk of accidents would be low during the construction of the proposed development considering the standard construction practices which are to be used and no unusual or hazardous substances or underground tunnelling works required or predicted.

Operational Phase

During the operational phase, it is anticipated that the risk of accidents will be influenced by the additional traffic generated by the proposed development. The potential likelihood of any incidents and the severity of such incidents is minimised due to the appropriate segregation of vulnerable road users through the development as a result of the new dedicated infrastructure proposals the design of which advocates self-regulating low speed streets and dedicated pedestrian / cycle linkages.

Noise and Vibration

The influence of traffic upon noise and vibration is considered in an earlier section of this EIAR.

Air Quality and Climate

The influence of traffic upon air quality and climate is considered in an earlier section of this EIAR.

12.12 DIFFICULTIES ENCOUNTERED IN COMPILING

There were no material difficulties encountered in compiling and assessing the data for this EIAR Chapter sufficient to prevent modelling of the likely transportation effects of the proposed development.

12.13 REFERENCES

'Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (May 2022)
TII Traffic & Transportation Assessment Guidelines; National Roads Authority (May 2014)
TII Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections (PE-PAG-02017); TII (October 2016)
'Traffic Management Guidelines' Dublin Transportation Office & Department of the Environment and Local Government (May 2003)
'Guidelines for Traffic Impact Assessments' The Institution of Highways and Transportation (1994)
Celbridge Local Area Plan 2017-2023
Kildare County Development Plan 2017-2023
Greater Dublin Area Cycle Network Plan, National Transport Authority (2013); www.nta.ie
Dublin Bus Website; www.dublinbus.ie
Irish Rail Website; www.irishrail.ie
Ordnance Survey Ireland; www.osi.ie
Transport Infrastructure Ireland; www.tii.ie
Transport for Ireland; www.transportforireland.ie