

PINNACLE

CONSULTING ENGINEERS



DB081

Traffic and Transport Assessment

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Prepared for:






**STRUCTURAL · CIVIL · DUE DILIGENCE · ENGINEERING MASTERPLANNING
FLOOD MANAGEMENT · INFRASTRUCTURE DESIGN
PRE-DEVELOPMENT ENGINEERING · BIM · TRANSPORTATION**

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1 Introduction

1.1 Background

This Traffic and Transport Assessment has been prepared by Pinnacle Consulting Engineers in support of a planning application for a data centre to South Dublin County Council.

The development will consist of the following:

- *Construction of a 3 storey (part 4 storey) data centre known as "DB8" to include data halls, electrical/plant rooms, offices, lobbies, ancillary staff areas including break rooms and toilets, stores, stair/lift cores throughout and photovoltaic panels at roof level. The total gross floor area excluding hot air plenums and external staircase is c.9,601sqm. The overall height of the data centre ranges from c.16m to c.20m to roof level and c.20m to c.24m including roof top plant, flues and lift overrun;*
- *Provision of 5 no. external generators, 8 no. fuel tanks and ancillary plant contained within a plant yard to the north of DB8;*
- *Provision of a water tank plant room, air cooled chillers and ancillary plant contained within a chiller plant yard to the south of DB8;*
- *Provision of a sprinkler pump room (c.23sqm), 2 no. sprinkler tanks (c.12m high each), heat recovery plant room (c.17sqm), ESB substation (c.44sqm), waste/bin stores (c.52sqm). Total floor area of ancillary structures and plant (c.303sqm);*
- *Provision of a delivery yard and loading bays, 64 no. car parking spaces, 5 no. motorcycle spaces, bicycle shelter serving 14 no. spaces, smoke shelter, internal access roads and footpaths, vehicular and pedestrian access to the west from Falcon Avenue and closure of existing vehicular entrances from Falcon Avenue;*
- *All associated site development works, services provision, drainage works including attenuation, landscape and boundary treatment works including berming, hedgerow protection areas and security fencing;*

The site has an area of 2.65 Ha.

The application site is located in South County Dublin, approximately 13km west of Dublin City Centre, and around 4km west of Clondalkin Village, immediately south of the Grand Canal.

The site is adjacent to the Profile Park and is bounded to the north by New Nangor Road, Greenfields to the west and Grange Castle Golf Club to the south and east.

There are currently 2 No. access points to the site via Profile Park Road. Profile Park Road connects Profile Park to the external road network via a 4-arm roundabout to the north via the R134 New Nangor Road.

The site is currently a greenfield site.

The site location is shown in Figure 1.

In order to complete this report, Pinnacle Consulting Engineering has referred to the following documents:

- Transport Infrastructure Ireland (TII) (Formerly National Roads Authority) Traffic and Transportation Assessment Guidelines.
- Traffic and Transport Assessment Guidelines' (May 2014) National Road Authority;
- '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;
- Design Manual for Urban Road and Streets;
- South Dublin County Development Plan 2016 - 2022;
- GDA Cycle Network Plan - National Transport Authority;

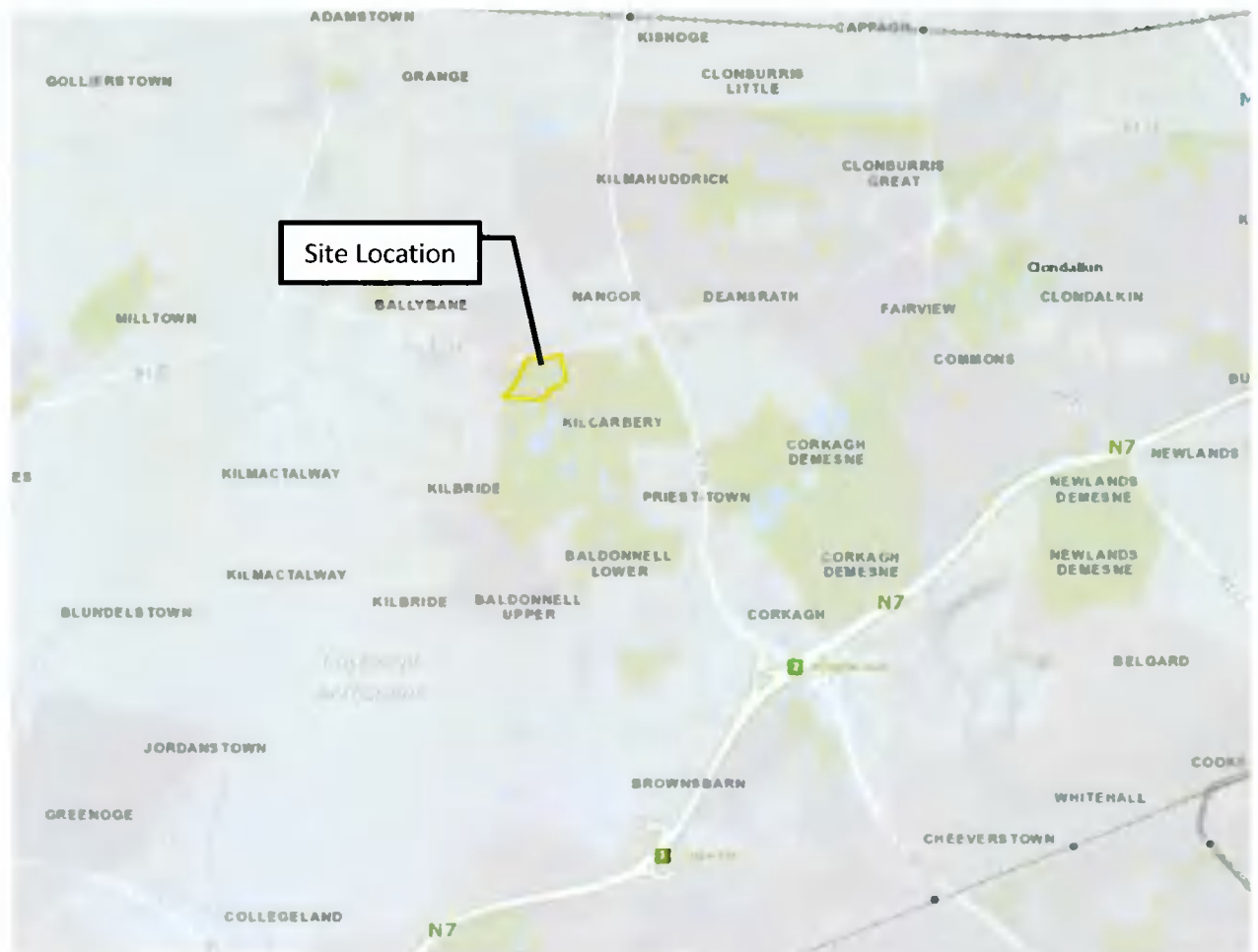


Figure 1 Site Location (Source: GeoHive)

1.2 Objectives

The main objective of this report is to examine the traffic impact of the proposed development and its access arrangements on the local area road network. The net change in traffic on the network due to additional traffic generated by the development has been calculated and its impact on the local area road network has been determined.

1.3 Study Methodology

The methodology adopted for this report can be summarised as follows:

Existing Transport Infrastructure: - Pinnacle Consulting Engineering collected information on public transport, walking and cycling in the area of the proposed development.

Development Proposals: - Description of proposed development, including proposed improvements to the road accesses to the site and a review of parking and servicing provisions, and facilities for pedestrians and cyclists.

Development Trip Generation Figures: - Based on the schedule of accommodation of the proposed development, Pinnacle Consulting Engineering derived trip rate data and developed development traffic flows, which were assigned to the existing network having regard for local traffic patterns on the surrounding network.

Percentage Impact: - The development traffic impact on key junctions was considered, taking account for traffic growth and committed development traffic.

1.4 Structure of Report

The remainder of this report is divided into the following sections:

- Section 2 considers the location of the site and existing traffic flows.
- Section 3 discusses the proposed development.
- Section 4 considers the traffic generation and potential impacts of the development, and contains an analysis of capacity of key junctions, including proposed mitigation measures
- Section 5 provides a summary and conclusion.

2 EXISTING TRAFFIC CONDITIONS

2.1 Existing Conditions

The application site is located in South County Dublin, approximately 13km west of Dublin City Centre, and around 4km west of Clondalkin Village, immediately south of the Grand Canal.

The site is adjacent to the Profile Park and is bounded to the north by New Nangor Road. Greenfields to the west and Grange Castle Golf Club to the south and east.

There are currently 2 No. access points to the site via Profile Park Road. Profile Park Road connects Profile Park to the external road network via a 4-arm roundabout to the north via the R134 New Nangor Road.

The location of the site is shown on the map extract at Figure 2 below.

The site is 2.65 Ha in size.

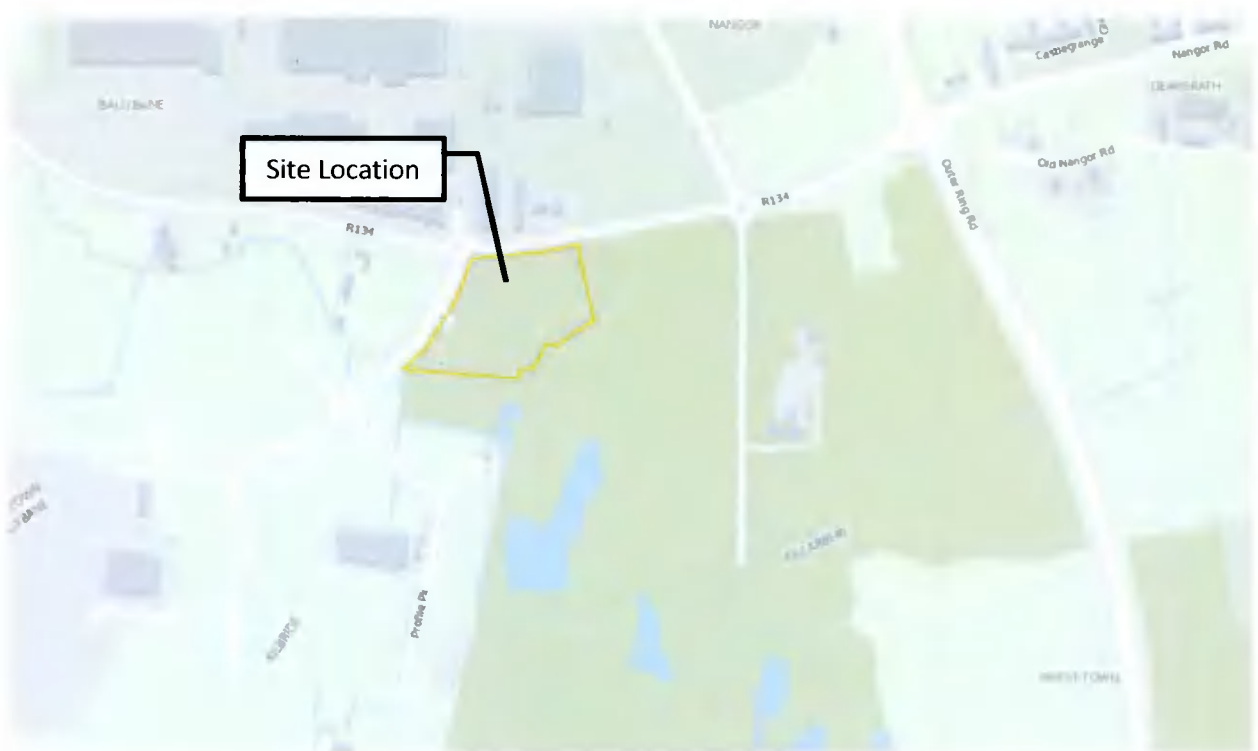


Figure 2 Site Location (Source: Google Maps)

2.2 Existing Road Network

A summary of the existing road network is provided below:

Profile Park Road

Profile Park Road is a dual carriageway which connections Profile Park with the external road network via the R134 New Nangor Road.

Profile Park Road measures c. 6.5m in each direction. The road is broken with a planted central median that measures c. 2.0m.

Profile Park has the benefit of a c. 3.0m footpath and associated grass verge.

There is existing street lighting in place.

Profile Park Road has a posted speed limit of 50km/h.

New Nangor Road

Profile Park Road forms a 4-arm roundabout with the R134 New Nangor Road to the northwest of the proposed development.

The R134 New Nangor Road is a two-way regional road forming junctions with the R120 to the west and the R136 to the east.

Along the northern boundary of the development, the R134 New Nangor Road measures c. 9.0. This is combined with a shared footpath/cycle path measuring c. 5.0m wide.

The R134 has a posted speed limit of 50km/h.

R136 Outer Ring Road

R134 New Nangor Road forms a junction R136 at a four-arm signalised junction located c. 1.0km to the east of the proposed development.

A 60 km/h speed limit is in operation on R134 on approach to the junction while an 80 km/h speed limit is in operation on approach from R136.

2.3 Traffic Data

The global COVID-19 pandemic and related restrictions implemented by the Irish Government in March 2020, has made the collection of accurate traffic data impossible.

Therefore, recent planning applications in the area have been reviewed to extract more representative data. Historic data from a classified junction turning count survey undertaken at the Profile Park Road/R134 New Nangor Road Roundabout on Tuesday 22 September 2015 between 07:00hrs and 18:59hrs was sourced.

The location of traffic counts are illustrated in the figure below.

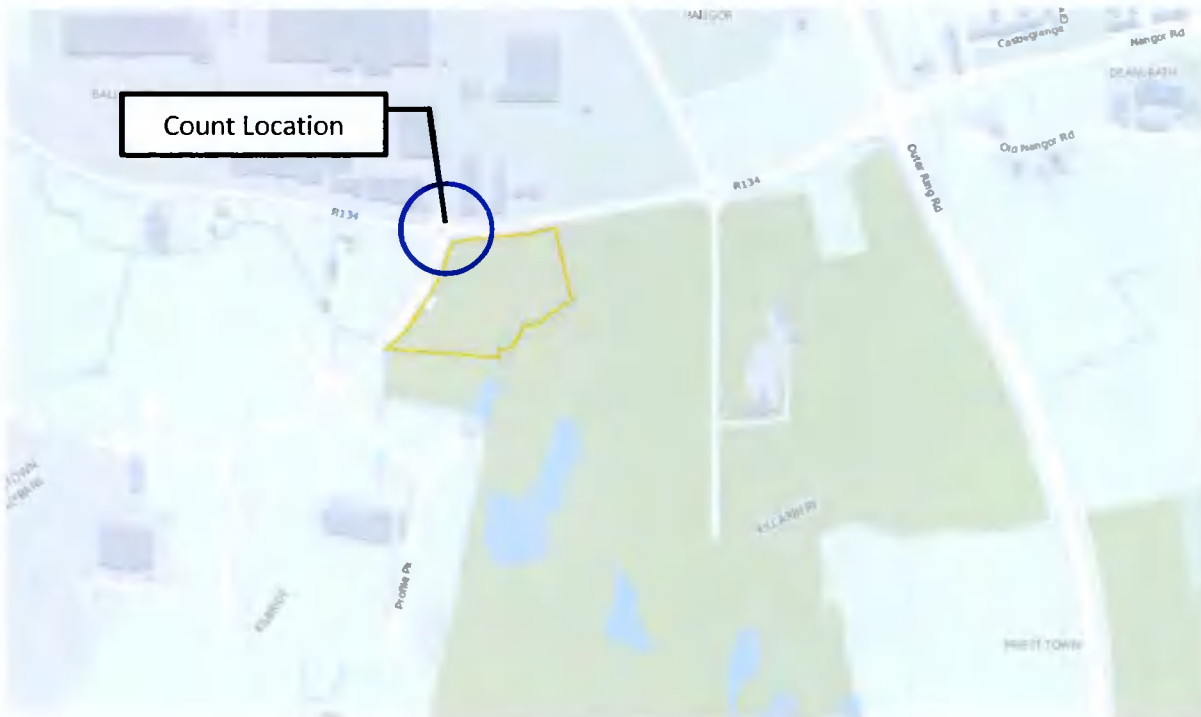


Figure 3 Traffic Count Location

The following traffic figures, representing 2020 traffic flows, were extracted from Reg. Ref. SD20A/0124.

Two-Way Link	AM Peak Hour (08:00hrs-08:59hrs)	PM Peak Hour (17:00hrs-17:59hrs)
Kilcarbery Park Access Road	204	201
R134 New Nangor Road (Eastern Arm)	1,133	975
Profile Park Road	32	18
R134 New Nangor Road (Western Arm)	1,254	1,121
Total Two-Way Link Flows (All Junction Arms)	2,624	2,315

Table 1 Existing Traffic Flows

2.1 Public Transport

2.1.1 Background

Local public transport infrastructure is illustrated in Figure 4 below.



Figure 4 Local Public Transport Infrastructure

2.1.2 Bus

There are a number of bus stops within 500-600m / 6-min walking distance of the application site. The nearest stops are on route no. 68 that connects Newcastle with the city centre. These stops are some 700m to the south of the subject site.

The bus stops within the Profile Park, such as those serving the no. 13 and 151 buses also have the ability to serve the site and contain stops within 800m of the site. The following table illustrates that there are regular services on all days which route to the existing bus stops on routes 13, 151 and 68.

Table 2 illustrates local bus routes.

No.	Route	Service	Mon-Fri	Sat	Sun	
13	Harristown – Dublin City Centre – Clondalkin Village – Grange Castle	Harristown	First	05:30	06:05	08:00
			Last	23:15	23:15	23:30
		Grange Castle	First	06:00	06:00	08:00
			Last	23:30	23:30	23:30
		Frequency	15min	15min	15min	
151	Docklands – Dublin City Centre – Clondalkin – Profile Park – Lucan	Docklands	First	06:30	07:10	08:30
			Last	23:20	23:20	23:20
		Grange Castle	First	06:00	06:30	07:30
			Last	23:30	23:30	23:30
		Frequency	20min	20min	30min	
68	Newcastle / Greenogue Business Park - Cherrywood Villas - Clondalkin Village - Bulfin Rd. - Camden St. - Hawkins St.	Newcastle	First	06:25	06:40	09:15
			Last	23:30	23:30	23:30
		Hawkins St	First	06:25	06:40	10:10
			Last	22:30	23:30	00:00
		Frequency	60min	70 min	115m	

Table 2 Local Bus Routes

Dedicated bus lanes are provided in both directions on the R136 Outer Ring Road and the R134 Nangor Road east of the Profile Park roundabout. These routes are part of Dublin's Quality Bus Corridor (QBC) network.

2.2 Walking and Cycling

The realignment of the R120 created cycle paths on either side of the road that will connect into other cycle paths along the realigned R134.

There is a current planning application proposed to the north of the canal to the immediate north of the site by South Dublin County Council to extend the greenway to the west of the lock and bridge. A cycle greenway already runs along the Royal Canal with access on to the R136. In addition, pedestrian and cycleways are available on all internal roads within Profile Park, and along the R136.

Existing cycle routes identified by the National Transport Authority (NTA) in the vicinity of the application are indicated in Figure 5 below.

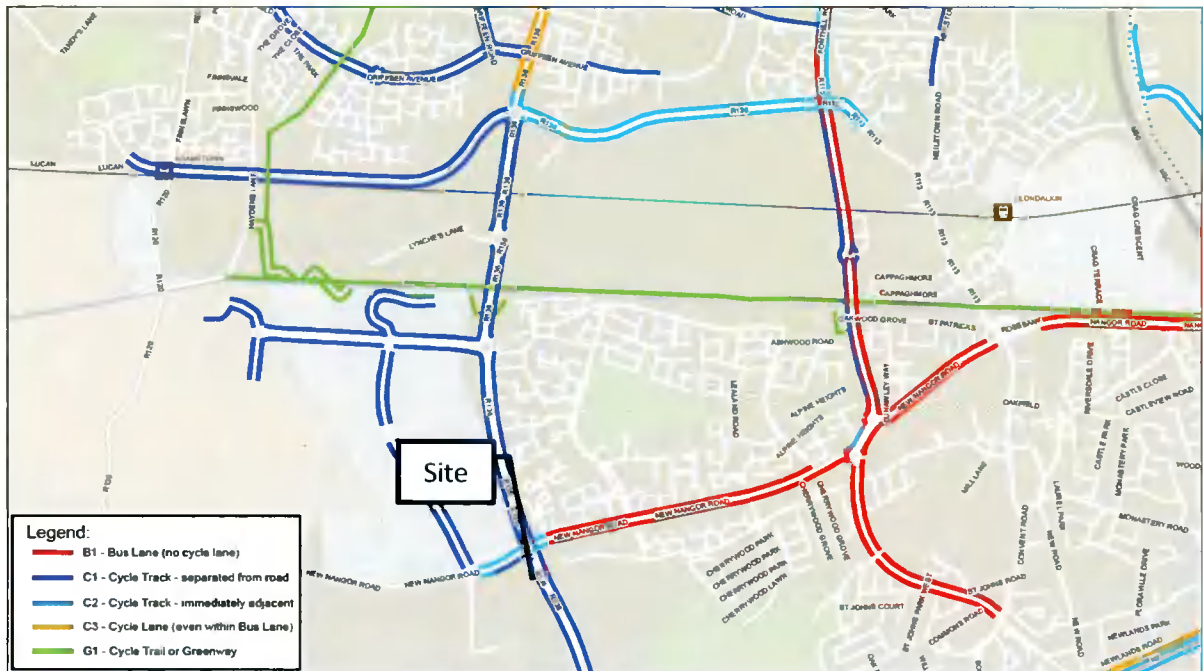


Figure 5 Existing cycle routes (Source: NTA)

The Grand Canal Greenway runs from east to west immediately north of the site. This pedestrian and cycle route provides an 8.5km off-road route from 12th Lock, Newcastle Road to Davitt Road, Inchicore. The route also links north to Adamstown and Lucan, via a walking and cycling bridge over the Grand Canal. The route can be accessed from the R136, approximately 1km from the site.

2.3 Permeability

Permeability for staff and visitors to the proposed development is a key factor in determining the long-term sustainability when considering modal choice.

To encourage a shift away from car dependency, staff and visitors to the development must have viable alternative choices such as walking routes and cycle routes public transport links.

2.3.1 Walking

Figure 6 outlines the walking distance covered by the average person in a 15-minute period. It illustrates the local amenities that are available to the proposed development.

All public transport nodes referred to in Section 2.1.2 of this report are accessible in the 15-minute walking isochrone.

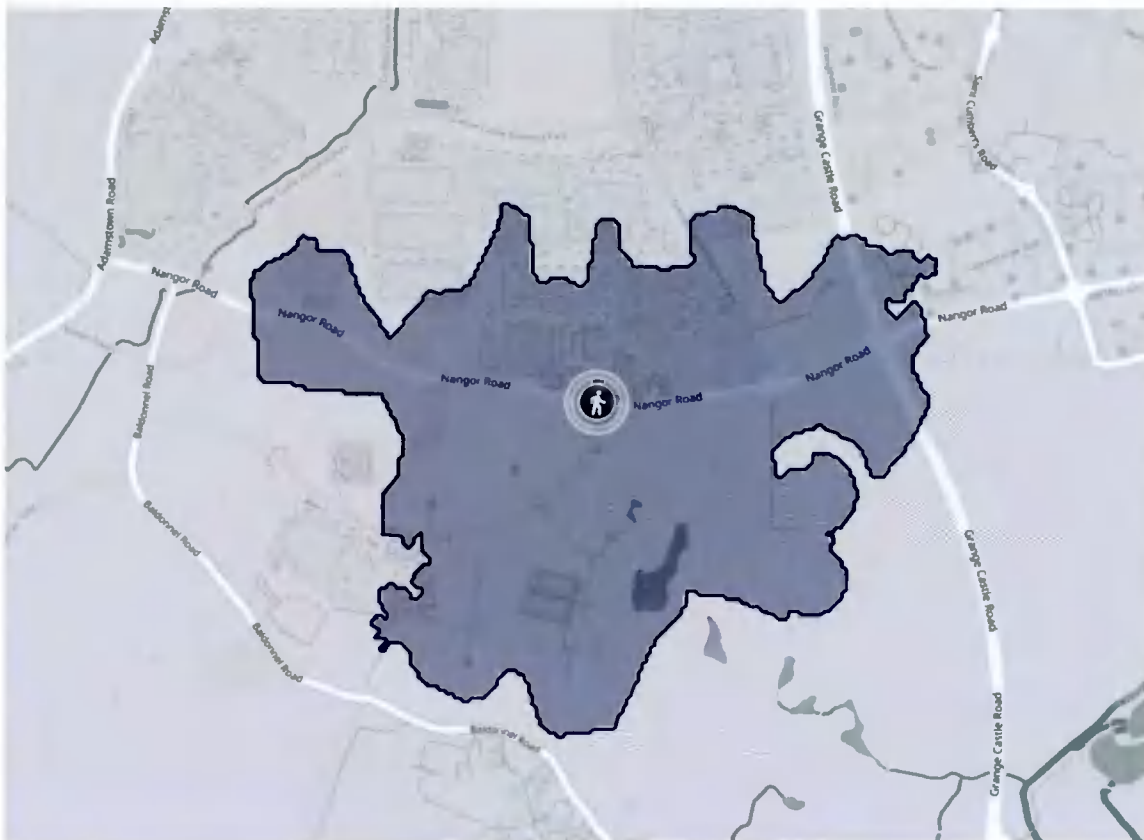


Figure 6 Walking Distance (15 Min Travel Time)

2.3.2 Cycling

Figure 7 outlines the cycling distance covered by the average person in a 30-minute period by bike. It illustrates the local amenities that are available to the proposed development. Local amenities within 30-minutes cycle of the proposed development include:

- Access to rail network
- Access to bus network
- Access to the site from local staff and visitorsial catchments
- Access to areas of employment (Profile Park, Citywest Business Campus, Grange Business Park, etc)
- Allows access to/from surrounding areas including:
 - Tallaght
 - Clondalkin
 - Lucan
 - Leixlip
 - Celbridge

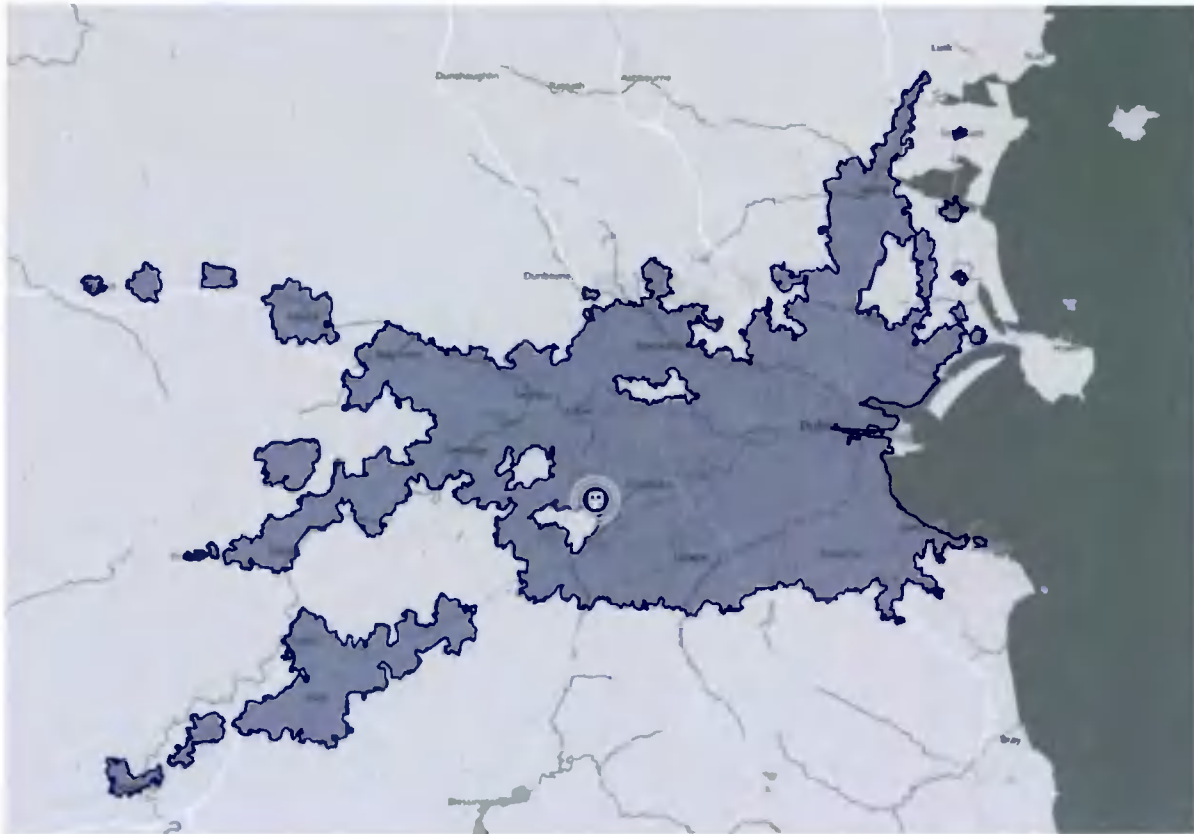


Figure 8 Public Transport (90min Travel Time)

2.4 Road Safety Data

A review of the Road Safety Authority (RSA) traffic collision database has been undertaken for the road network in the vicinity of the proposed site to identify any collision trends. This review will assist to identify and potential safety concerns in relation the existing road network.

Traffic collision data was obtained for the period 2005-2016 which is the most recent data available from the RSA website. These incidents are categorised into class of severity, which includes minor, serious or fatal collisions. The analysis is shown in Figure 9.

The following incidents were reported on the New Nagor Road/Profile Park Road roundabout

- 2016 – Bicycle – 1 Minor injury
- 2015 – Car – Rear end, straight ahead – 1 minor injury



Figure 9 Road Collisions (Source: RSA)

2.5 Planning Search

A planning search was undertaken to identify any developments that have planning permission but are not yet implemented or any schemes that are implemented but are as of yet un-let or empty.

Development: SD20A/0124

Description: (1) Demolition of existing single storey dwelling (c.108.5sq.m); (2) construction of a Distribution Warehouse Building comprising warehousing and ancillary areas at ground floor and support offices, staff areas and plant across two floors; (3) the development will be accessed from the existing Profile Park estate road; (4) provision of car parking, cycle parking, security gatehouse, landscaping and boundary treatments (including security fencing and gates); (5) all associated site development and services works (including diversion/culverting/reprofiling of existing stream on site); (6) total gross floor area of the development c.17,006sq.m.

Status: Granted

Where applicable, the traffic figures referenced in the above application will be used in the assessment of the impact the proposed development will have on the local road network.

2.6 Potential/Proposed/Committed Infrastructure Works

There are several potential new infrastructure schemes in the vicinity of the proposed development site. Consideration has been given to the impact that these infrastructure schemes may have on the development. This will ensure that provision is allowed for these schemes to be delivered in the future.

A summary of the potential road infrastructure schemes is outlined below.

2.6.1 Bus Connects

The emerging Bus Connects Dublin plan (Ref: Core Bus Corridors Project Report June 2018) proposes revisions to Dublin's bus system through: -

- building a network of new bus corridors on the busiest bus routes to make bus journeys faster, predictable and reliable;
- completely redesigning the network of bus routes to provide a more efficient network, connecting more places and carrying more passengers;
- developing a state-of-the-art ticketing system using credit and debit cards or mobile phones to link with payment accounts and making payment much more convenient;
- implementing a cashless payment system to vastly speed up passenger boarding times;
- revamping the fare system to provide a simpler fare structure, allowing seamless movement between different transport services without financial penalty;
- implementing a new bus livery providing a modern look and feel to the new bus system;
- rolling out new bus stops with better signage and information and increasing the provision of additional bus shelters; and
- transitioning - starting now - to a new bus fleet using low emission vehicle technologies.

The Dublin Area Bus Network Redesign (which is currently under review following the public consultation stage) aims "to provide a network designed around the needs of Dublin today and tomorrow, rather than based on the past".

Figure 10 below presents the proposed public transport provision in the vicinity of the subject site compared to the existing provision.

As shown in the figure below, the development site is within reasonable walking distance (less than 15-minutes) from proposed Route No. 356 (peak hour only) and Route No. 256 with hourly services.

These radial routes connect the application site to Dublin City Centre and Ballymount.

Bus stops for the proposed orbital Route No. W4 will be located c. 800 metres from the development site, which will provide access to/ from Castleknock to the north and Tallaght to the south. A branch of the D Spine Corridor (D1) is proposed along R136/ New Nangor Road ca. 1.0 kilometre to the east of the site.

These routes will have a frequency of every 10-15 minutes during peak hours and shall connect the site to North Dublin via the City Centre.

The proposals contained within the Dublin Area Bus Network Redesign Project will improve the site's public transport connectivity from both radial and orbital destinations, however it is noted that the bus network in the vicinity of the site will continue to operate at relatively low frequency following its implementation.

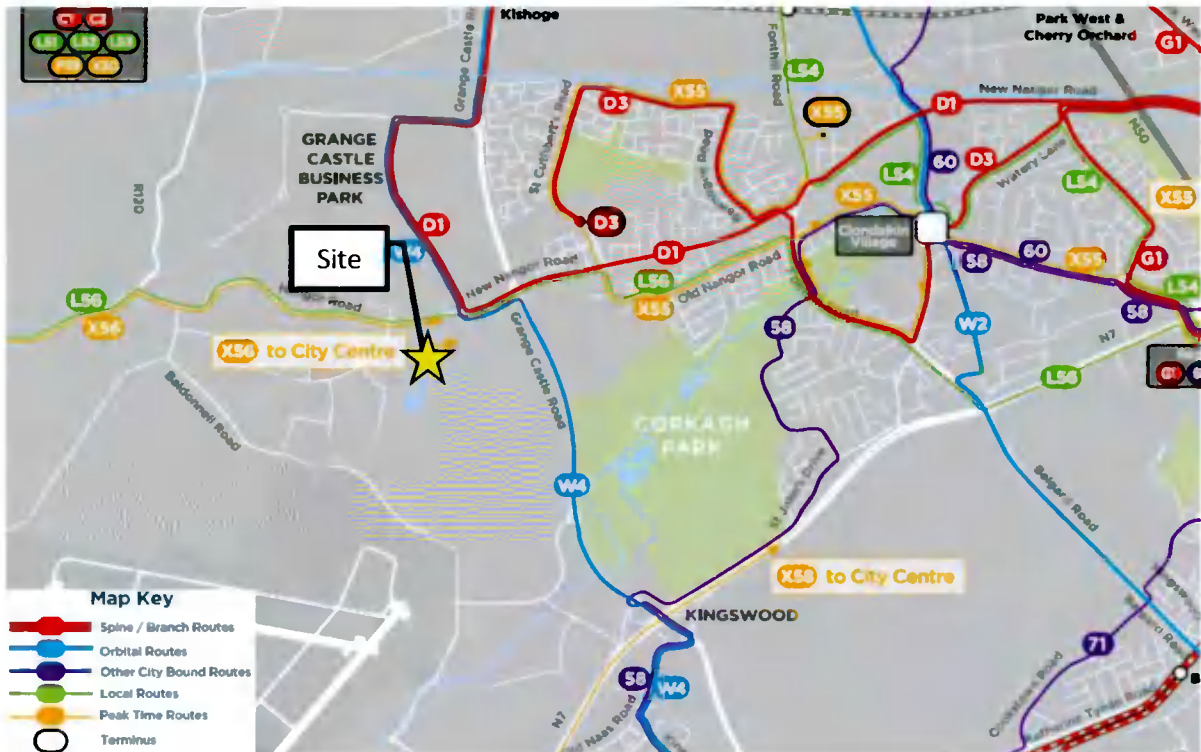


Figure 10 Bus Connects (Source: Map 2 of Bus Connects)

2.6.2 Cycle Network Improvements

Under the National Transport Authority's Cycle Network Plan for the Greater Dublin, the Dublin South West Sector extends outward from the twin corridors of Camden Street and Clanbrassil Street in the city centre, through the inner suburbs of Rathmines and Harold's Cross, to serve the areas of Terenure, Kimmage, Walkinstown, Tallaght, Firhouse and Rathfarnham. There is considerable overlap between the West and South West sectors, with interconnecting routes between the two. Some radial cycle routes originate in one sector at the city centre but end up in the neighbouring sector.

In accordance with the National Transport Authority's Cycle Network Plan for the Greater Dublin area the following improvements to the local cycle networks are proposed:

- Route 7C: Camac River Greenway branch from the Grand Canal through Clondalkin Village to Corkagh Park and City West;
- Route 8A follows Crumlin Road past the Children's Hospital, Bunting Road to Walkinstown, through Ballymount to cross the M50 at Junction 10 and out to Citywest / Fortunestown via Belgard;
- Route 8C2 follows along the length of R134 New Nangor Road which will connect the site to Dublin City Centre via Crumlin. Another secondary route in vicinity to the site extends along the R136 (Route SO6), connecting the site to Lucan to the north and Tallaght to the south. Route SO6 connects to the Royal Canal Greenway which will link the proposed development to the City Centre via Adamstown, Bluebell, and Rathmines.
- Route 9C is an alternative to the Harold's Cross route from Route 8C at Clogher Road via Stannaway Road west of Kimmage and then along Wellington Lane to join Route 9A at Spawell to connect to Tallaght. It also provides a continuation from Route 9A west of Tallaght via Fortunestown and Citywest to Saggart;
- Route 9D would provide a traffic-free option branching off Route 9A at Kimmage Cross Roads and following the River Poddle Greenway to Tymon Park where a new bridge is required over

the M50 in the centre of the park to connect with Castletymon Road and rejoin Route 9A. West of Tallaght it provides a loop through Jobstown along the N81 and then northward into Citywest;

- The Dublin South West Sector extends outward from the twin corridors of Camden Street and Clanbrassil Street in the city centre, through the inner suburbs of Rathmines and Harold's Cross, to serve the areas of Terenure, Kimmage, Walkinstown, Tallaght, Firhouse and Rathfarnham. There is considerable overlap between the West and South West sectors, with interconnecting routes between the two. Some radial cycle routes originate in one sector at the city centre but end up in the neighbouring sector.
- Orbital Route SO6 (Dun Laoghaire to Tallaght via Ballycullen and Old Bawn) is part of the Orbital Routes in the Dublin South West Central Sector. There are six orbital routes proposed under the National Transport Authority's Cycle Network Plan for the Greater Dublin area in the Dublin West South Central Sector providing cross-links between the radial routes and give access to destinations such as Camden Street and Clanbrassil Street in the city centre, through the inner suburbs of Rathmines and Harold's Cross, to serve the areas of Terenure, Kimmage, Walkinstown, Tallaght, Firhouse and Rathfarnham within this sector.

The proposed cycle routes are illustrated in Figure 11 below.

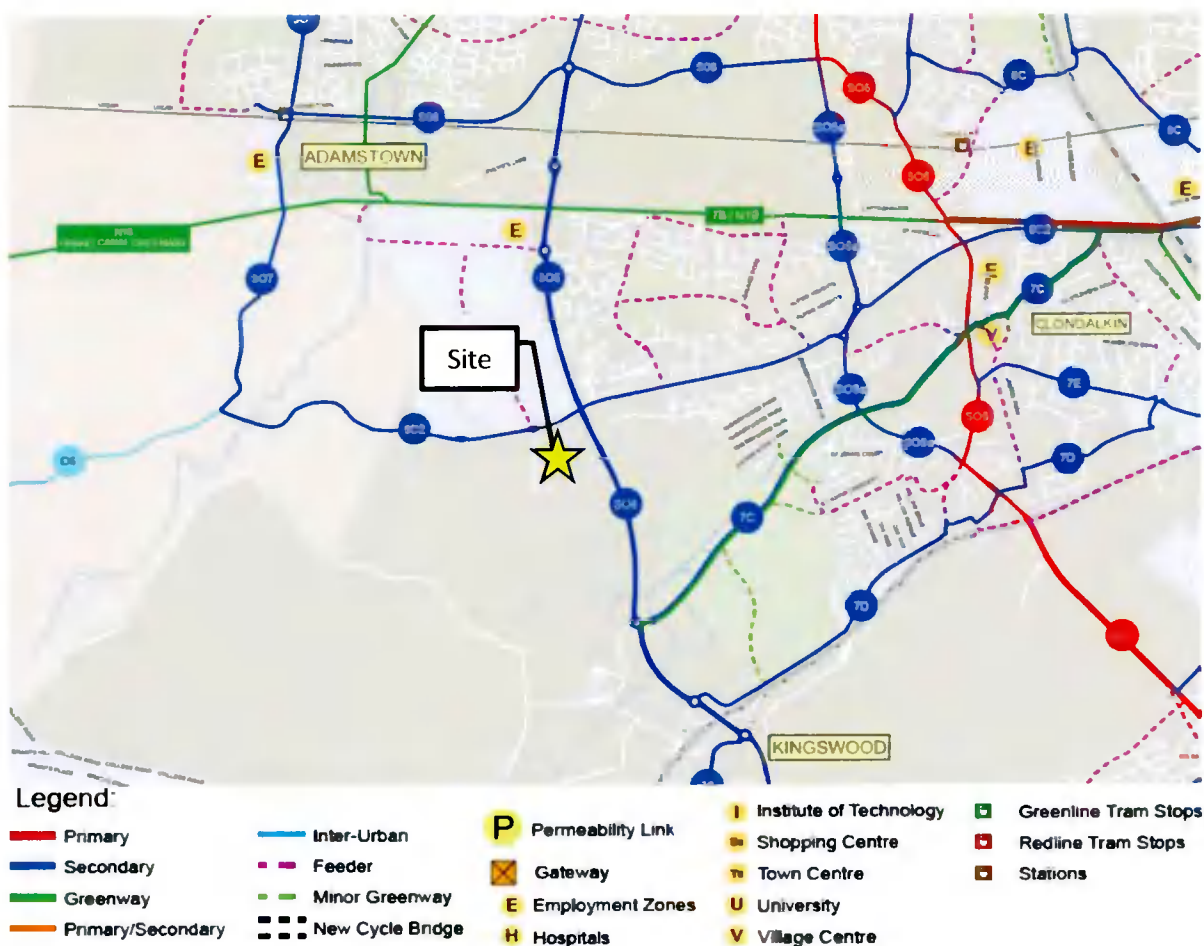


Figure 11 Proposed cycle routes (Source: NTA)

2.7 Summary

In summary, the existing site benefits from good levels of existing public transport and walking/cycling infrastructure which will assist to encourage sustainable modes of travel for staff and visitors to/from the proposed development.

3 THE PROPOSED DEVELOPMENT

3.1 General

The development will consist of the following:

- Construction of a 3 storey (part 4 storey) data centre known as "DB8" to include data halls, electrical/plant rooms, offices, lobbies, ancillary staff areas including break rooms and toilets, stores, stair/lift cores throughout and photovoltaic panels at roof level. The total gross floor area excluding hot air plenums and external staircase is c.9,601sqm. The overall height of the data centre ranges from c.16m to c.20m to roof level and c.20m to c.24m including roof top plant, flues and lift overrun;
- Provision of 5 no. external generators, 8 no. fuel tanks and ancillary plant contained within a plant yard to the north of DB8;
- Provision of a water tank plant room, air cooled chillers and ancillary plant contained within a chiller plant yard to the south of DB8;
- Provision of a sprinkler pump room (c.23sqm), 2 no. sprinkler tanks (c.12m high each), heat recovery plant room (c.17sqm), ESB substation (c.44sqm), waste/bin stores (c.52sqm). Total floor area of ancillary structures and plant (c.303sqm);
- Provision of a delivery yard and loading bays, 64 no. car parking spaces, 5 no. motorcycle spaces, bicycle shelter serving 14 no. spaces, smoke shelter, internal access roads and footpaths, vehicular and pedestrian access to the west from Falcon Avenue and closure of existing vehicular entrances from Falcon Avenue;
- All associated site development works, services provision, drainage works including attenuation, landscape and boundary treatment works including berming, hedgerow protection areas and security fencing;

The site has an area of 2.65 Ha.

3.2 Site Access

The lands are part serviced by 2 No. access points.



Figure 12 Existing Access

The site will be accessed from the existing left in/left out junction (Access No. 1) from the development on to the Profile Park Road. This access is located on the southwest boundary of the development.

Note that the access (Access No. 1) located on the northwest boundary of the site is the closed as part of this application.

3.3 Servicing

An AutoTrack analysis has been carried on the internal service access to demonstrate its capability to cater for staff, visitor and third party access, in conjunction with the proposed control system.

The results of this analysis show that the proposed development can accommodate the anticipated service vehicles that will serve the proposed development.

Refer to Pinnacle Consulting Pinnacle Consulting Engineers drawings for the proposed swept path analysis for the service arrangements.

3.4 Car Parking Provision

Under South Dublin County Development Plan 2016-2022, data centres are not classified as a specific lands use in the car parking calculations. Therefore, the provision of car parking spaces is based on a first principal calculation will be provided i.e., car parking spaces provided based on the number of employees/visitors to the development.

The Applicant has a sister site (DB3) which is of similar size, location and accessibility to public transport located in North County Dublin. Based on the numbers of employees and visitors to the sister site, the Applicant estimates that there will be a need for 65 No. car parking spaces for the facility that is subject of this planning application with 25 no spaces for the future development.

Of these spaces, c. 15 will be reserved for staff employed directly by the Applicant. The remainder of spaces – 50 - will be reserved for visitors and 'clients' of the co-located data halls.

The following information provided by the client is an estimate of the headcount in the DB3 facility to support the numbers above.

1. Permanent Staff - 14
2. Visitors - 44
3. Contractors on site – 4-6

Therefore, the data centres will be served by 64 car parking spaces of which 5 no. spaces will be disabled spaces. It is intended that 8 of these spaces will be provided for electrical charging vehicles with the remainder of the car parking spaces ducted for future upgrade.

3.5 Cycle Parking Standards

Sheltered bicycle parking will be provided on site with up to 14 cycle spaces.

3.6 Pedestrian and Cycle networks

3.6.1 Introduction

It is a necessary part of the design framework for a development such as this to ensure that there is good permeability for those staff and visitors to the development who choose not to travel by car. The development has been designed to ensure that there is good permeability for pedestrians and cyclists.

Connections between the internal layout and the external pedestrian and cycle networks form part of the overall access strategy for the site. With this development pedestrian movement is suitably catered for by footpath connections within and adjacent to the development up to the relevant boundaries. These provide good linkage to the surrounding urban areas.

The internal layout demands that all visitors to the site are catered for and so pedestrian routes between dwelling areas and key nodes within the layout are well designed and clearly delineated. This applicant is very experienced in creating safe environments that satisfy staff and visitors' requirements and convenience. Accordingly, every effort has been made to ensure that vehicular access will be restricted in areas where there are likely to be the highest concentrations of pedestrian/cycle movements.

The internal site layout will include several crossing facilities that are located along key desire lines and which coordinate well with the circulation within the car park area to enhance the safety, visibility and convenience of those people on foot. These facilities will include features such as tactile paving and surface treatments that will benefit all users and assist those with impaired mobility.

Given the desire in current planning guidance to improve accessibility for non-car modes of travel, access by cycle is increasingly important. Since the weather and topography inevitably have an influence on cycle use, the key to cycle accessibility is the existence of convenient and safe links associated with secure and carefully sited cycle parking.

3.6.2 Facilities and access for those with impaired mobility

The design has sought to ensure that the environment created within this development will be accessible to staff and visitors with disabilities. Footpaths will be designed in accordance with the latest design criteria to ensure safe access for those that have a mobility impairment.

4 TRAFFIC GENERATION AND DISTRIBUTION

4.1 General

The purpose of this section is to determine the overall number of trips that will be generated by the proposed development. Following quantification of the trip generation, these trips will be distributed onto the adjoining road network to allow a traffic assessment of the local network.

The traffic generation potential of the proposed development has been estimated using the anticipated number of employees and visitors to the development.

The methodology for assessing the traffic implications of this development involves quantifying the number and nature of trips that would be generated and reviewing these trips in the context of the prevailing conditions, the area of influence and the available infrastructure.

The nature of the development and its relative location to the catchment dictates that the modal choice to and from the site would primarily be via private car but with some elements of public transport use.

Accordingly, the development will attract private car, pedestrian and cycle visitation that will need to be catered for in terms of access routes and internal design. Visitation will also include staff and visitors using public transport connections.

A significant factor in trip attraction and hence resultant impact on the surrounding network is the relationship between trips that already utilise the road network which would choose to visit the development and those trips which would be newly generated onto the road network by the creation of the development in this location.

Research into trips associated with developments of this type has been extensive and in order to try and determine a realistic level of resultant impact the following classifications are adopted.

Primary New trip ~ a single purpose trip (such as development-work-development) that would not exist on the network prior to the opening of the development.

Primary Transfer trip ~ an existing single purpose trip to another destination (such as another similar development) that would transfer to the new development once it becomes operational.

Non-Primary Diverted trip ~ an existing multi-purpose (linked) trip that involves deviating from the normal route in order to visit the new development whilst on the way to another destination.

Non-Primary Pass-By trip ~ an existing multi-purpose (linked) trip that arises from visiting the new development without having to deviate significantly from the existing route being taken.

A Primary trip is one which has the same origin on visiting the site as destination when leaving the site, but only a proportion of these are newly generated (i.e. would not have taken place if the development didn't exist). The remainder of primary trips already exist on the road network as they would be those visiting another similar but existing destination.

A pass-by trip is a form of trip that doesn't result in any additional load to the impact area, since it already exists on the network adjacent to the site.

For the purpose of this assessment, it is assumed that the proposed development will generate primary new trips.

4.2 Trip Rate

In order to understand the expected trip generation of the data centre assumptions have been made on the level of staff associated with the proposed development, based on information provided by the Applicant.

Appropriate estimates have been made, where necessary, in order to provide a robust analysis of the impact of traffic associated with the proposed development on the local road network.

The site will accommodate up to 65 employees and visitors to the development. It is assumed the site will work in 3 shifts as follows:

- 08:00-16:00 – 25 Arrivals/ 15 Departures

- 16:00-00:00 - 25 Arrivals/ 25 Departures
- 00:00 – 08:00 – 15 Arrivals/ 25 Departures

The proposed peak hour trip rates are shown in Table 3 below.

Weekday Trip Generation	AM Peak (08:00 – 09:00)		PM Peak (16:00-17:00)	
	Departures	Arrivals	Departures	Arrivals
Staff	15	25	25	25
Total	15	25	25	25
Two-Way Total	40		50	

Table 3 Predicted staffing requirements

It can be seen from the above that the total vehicle movements generated by the proposed development will be 15 arrivals and 25 departures in the AM peak (two-way total of 40). The total number of vehicle movements in the PM peak hour will be 25 arrivals and 25 departures (two-way total of 50).

Note, the traffic counts estimate a peak from 08:00-09:00 in the AM and 17:00-18:00 in the PM. For the purpose of the development, the network peak will be assessed against the development peak to ensure a robust assessment.

5 Junction Analysis

5.1 Introduction

To assess the resultant impact on the surrounding road network, the anticipated traffic generation and distribution through the network has been applied to the traffic model in order to assess comparative flow levels at the surveyed locations and to analyse resultant junction performance.

5.2 Growth Factors

The estimated opening year for the proposed development is 2025. This has therefore been the focus of the road network assessment.

The traffic flows on the surrounding road network, were determined from TII's Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections, May 2019. Information within these guidelines is provided for Dublin from 2016-2030 and from 2030-2040 for low, central and high growth scenarios.

The factor used is outlined below:

Traffic Growth Rates, NRA Project Appraisal Guidelines		
Year	To Year	Table 5.5.1
2016	2025	1.0317

Table 4 Growth Factors

The applicable growth factors have been applied to the survey data extracted from Reg. Ref. SD20A/0124. These figures are illustrated in Table 5 below.

Two-Way Link	AM Peak Hour (08:00hrs-08:59hrs)	PM Peak Hour (17:00hrs-17:59hrs)
Kilcarbery Park Access Road	222	219
R134 New Nangor Road (Eastern Arm)	1235	1063
Profile Park Road	35	20
R134 New Nangor Road (Western Arm)	1367	1222
Total Two-Way Link Flows (All Junction Arms)	2860	2523

Table 5 Factored Traffic Counts

5.3 Committed Development

Table 6 illustrates the expected trips that will be generated under Reg. Ref. SD20A/0124.

Weekday Trip Generation	AM Peak (08:00 – 09:00)		PM Peak (16:00-17:00)	
	Departures	Arrivals	Departures	Arrivals
SD20A/0124	25	11	9	24

Table 6 Committed Development

These trips will be assigned to the network as illustrated in Table 7 based on existing traffic patterns.

Two-Way Link	AM Peak Hour (08:00hrs- 08:59hrs)	PM Peak Hour (17:00hrs- 17:59hrs)
Kilcarbery Park Access Road*	3	3
R134 New Nangor Road * (Eastern Arm)	16	14
Profile Park Road**	36	33
R134 New Nangor Road * (Western Arm)	17	16
Total	36	33

Table 7 Distribution of committed development

* Trips generated from the development but assigned to the roundabout.

** Trips generated by the development and access/egress Profile Park via Profile Park Road.

*** Number of trips generated by development in total.

5.4 Baseline Flows

The base line flows for the roundabout are illustrated in Table 8.

Two-Way Link	AM Peak Hour (08:00hrs- 08:59hrs)	PM Peak Hour (17:00hrs- 17:59hrs)
Kilcarbery Park Access Road	225	222
R134 New Nangor Road (Eastern Arm)	1251	1077
Profile Park Road	71	53

R134 New Nangor Road (Western Arm)	1384	1238
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Table 8 Distribution of committed development

5.5 Development Impact

The flows generated by the proposed development were added to the network and their percentage impact calculated, as illustrated in Table 9.

Two-Way Link	AM Peak Hour (08:00hrs-08:59hrs)			PM Peak Hour (17:00hrs-17:59hrs)		
	Baseline	Dev Flows	% Impact	Baseline	Dev Flows	% Impact
Kilcarbery Park Access Road	225	3	1.40%	222	4	2.14%
R134 New Nangor Road (Eastern Arm)	1251	17	1.40%	1077	21	1.87%
Profile Park Road	71	40	53.42%	53	50	156.25%
R134 New Nangor Road (Western Arm)	1384	19	1.40%	1238	24	1.95%
Overall		1.38%			1.91%	

Table 9 Percentage Impact of Development on Roundabout

Excluding Profile Park Road, which services a private business park and provides access to the development, the proposed development will increase traffic at the Profile Park Road/New Nangor Road by 1.38% in the AM Peak and up to 1.91% in the PM Peak.

The TII Guidelines for Transport Assessments state that the threshold for junction analysis in Transport Assessments is as follows:

- Traffic to and from the development exceeds 10% of the existing two-way adjoining highway
- Traffic to and from the development exceeds 5% of the existing two-way adjoining highway, where traffic congestion exists or will exist within the assessment periods or in other sensitive locations
- Industrial development in excess of 10,000 sq. m

As a result of the above, it is concluded that the proposed development will have a minor impact on junctions in the vicinity of the site. Therefore, it is not considered necessary to undertake any further junction assessment.

6 SUMMARY

This Traffic and Transport Assessment has been prepared by Pinnacle Consulting Engineers in support of a planning application to South Dublin County Council for a data centre and associated infrastructure.

The site has an area of 2.65 Ha.

The site is adjacent to the Profile Park and is bounded to the north by the Grand Canal; the realigned R120 to the east; agricultural land to the west and south.

6.1 Development Proposals

The development will consist of the following:

- *Construction of a 3 storey (part 4 storey) data centre known as "DB8" to include data halls, electrical/plant rooms, offices, lobbies, ancillary staff areas including break rooms and toilets, stores, stair/lift cores throughout and photovoltaic panels at roof level. The total gross floor area excluding hot air plenums and external staircase is c.9,601sqm. The overall height of the data centre ranges from c.16m to c.20m to roof level and c.20m to c.24m including roof top plant, flues and lift overrun;*
- *Provision of 5 no. external generators, 8 no. fuel tanks and ancillary plant contained within a plant yard to the north of DB8;*
- *Provision of a water tank plant room, air cooled chillers and ancillary plant contained within a chiller plant yard to the south of DB8;*
- *Provision of a sprinkler pump room (c.23sqm), 2 no. sprinkler tanks (c.12m high each), heat recovery plant room (c.17sqm), ESB substation (c.44sqm), waste/bin stores (c.52sqm). Total floor area of ancillary structures and plant (c.303sqm);*
- *Provision of a delivery yard and loading bays, 64 no. car parking spaces, 5 no. motorcycle spaces, bicycle shelter serving 14 no. spaces, smoke shelter, internal access roads and footpaths, vehicular and pedestrian access to the west from Falcon Avenue and closure of existing vehicular entrances from Falcon Avenue;*
- *All associated site development works, services provision, drainage works including attenuation, landscape and boundary treatment works including berming, hedgerow protection areas and security fencing;*

The site has an area of 2.65 Ha.

6.2 Development Access

The site will be access from the existing left in/left out junction (Access No. 1) from the development on to the Profile Park Road. This access is located on the southwest boundary of the development.

Note that the access (Access No. 1) located on the northwest boundary of the site is the closed as part of this application.

6.3 Parking

The Applicant has a sister site (DB3) which is of similar size, location and accessibility to public transport located in North County Dublin. Based on the numbers of employees and visitors to the sister site, the Applicant estimates that there will be a need for 64 No. car parking spaces for the facility that is subject of this planning application with 25 no spaces for the future development.

Of these spaces, c. 15 will be reserved for staff employed directly by the Applicant. The remainder of spaces – 50 - will be reserved for visitors and 'clients' of the co-located data halls.

Sheltered cycle parking will be provided on site for up to 14 No. cycle spaces.

6.4 Servicing

An AutoTrack analysis has been carried out at the proposed site access junction and the car parking layout to demonstrate its capacity to cater for the anticipated vehicle usage.

6.5 Trip Generation

For the scale and type of development proposed, it is expected that the development will generate 40 new trips in the AM peak hour, and 50 new trips in the PM peak hour.

6.6 Operational Assessment

The results of the TII threshold analysis undertaken demonstrates that traffic from the proposed development can be accommodated on the surrounding road network and is within reasonable limits having regard to the location of the proposed development.

6.7 Conclusion

The Transport Assessment demonstrates conclusively that traffic generated as a result of the proposed development can be accommodated within the surrounding road network and will not have an adverse impact on the surrounding road network.

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