



1.1.1

## Grange Castle Data Centre (EDCDUB02A&03)

Transport Statement

Edge Connex

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Prepared for:



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# 1 INTRODUCTION

## 1.2 Background

Pinnacle Consulting Engineering has been commissioned to undertake a Transport Assessment in support of a planning application to South Dublin County Council for a Data Centre on lands comprising the Grange Castle Business Campus.

The site is adjacent to the Grange Castle Business Park and is bounded to the north by planting and the Grand Canal; the R120 to the west; Grange Castle Business Park to the east and residential, office and commercial premises to the south.

The main entrance into the Grange Castle Business Park is from a roundabout junction on the R136 Grange Castle Road. The business park is also accessed via a 9m wide single carriageway road which forms a roundabout junction with the R134 Nangor Road.

The site of the proposed data centre is currently accessed from the internal Grange Castle Business Park Road network via the roundabout junction on the R136 Grange Castle Road.

The site location is shown in Figure 1.

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

- The Traffic Management Guidelines
- Guidance on Transport Assessment



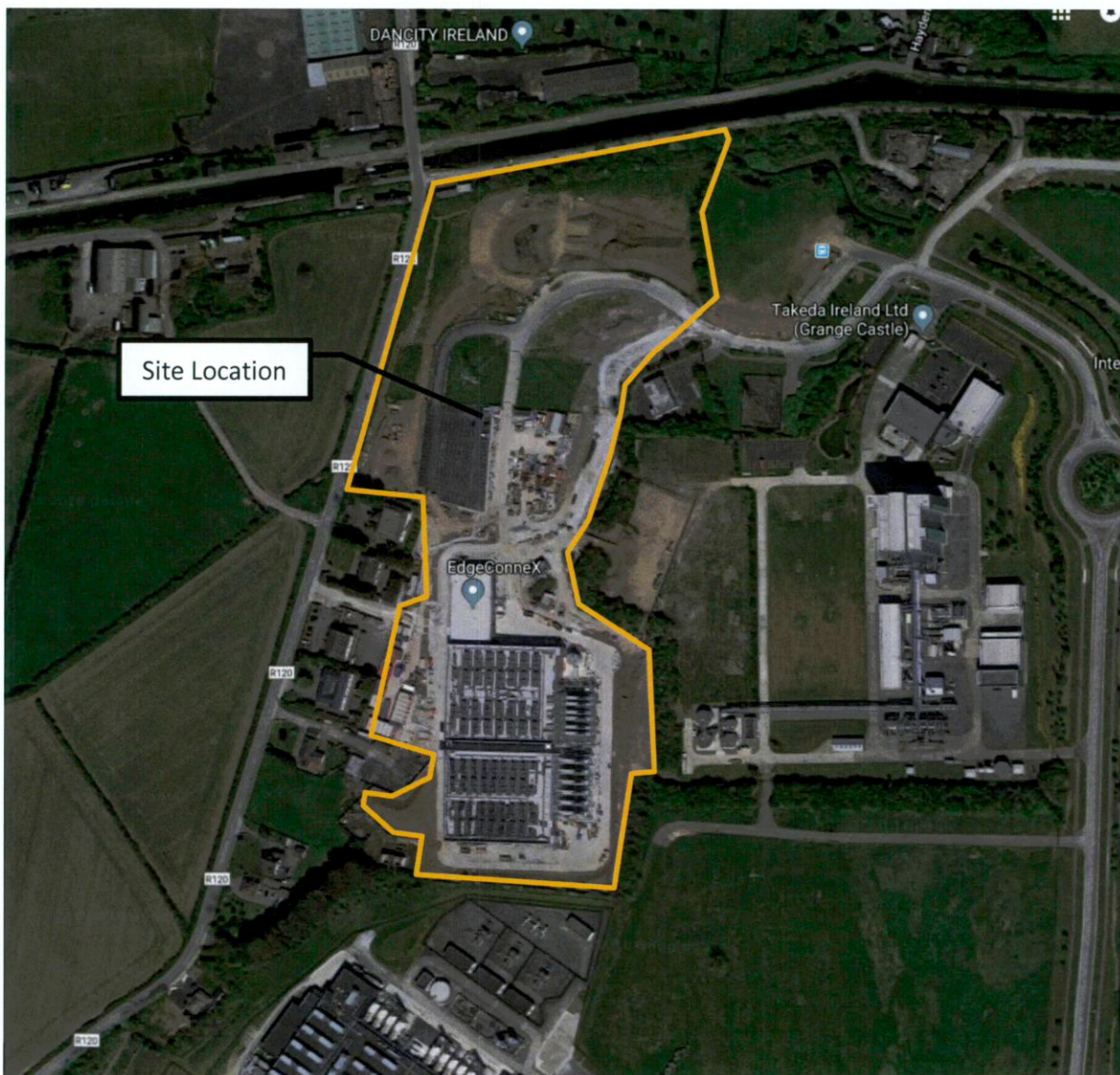


Figure 1 Site Location (Source: Google Maps)

### 1.3 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 has been calculated and its impact on the local area road network has been determined.

### 1.4 Study Methodology

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

**Exiting Traffic Flow Assessment:** - A planning search was undertaken for recent planning applications that included baseline traffic data for the site. This method was agreed for previous applications with the Senior Executive Engineer of South Dublin County Council's Land Use Planning & Transportation Department. The search returned a planning application for a Microsoft Data Centre (Reg. Ref. – SD15A/0133) located at Grange Castle Business Park (GCBP) and the previous phased development on this site under Reg. Ref. SD16A/0214, SD16A/0345, SD17A/0027, SD17A/0141 and SD17A/0392.

**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 the site and a review of parking and servicing provisions, and facilities for pedestrians and cyclists.

**Development Trip Generation Figures:** - Based on the floor area 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.

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

**Assessment of Junction Capacity:** - The operation of key junction, with and without the proposed development, was undertaken, to determine future operation and any requirements for mitigation measures.

**Committed Developments in the Area:** - Consideration was given to committed developments that would impact on the transport network in the vicinity of the site.

### **1.5 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 if required; and
- 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 Grange Castle Business Park and is bounded to the north by planting and the Grand Canal; the R120 to the west; Grange Castle Business Park to the east and residential, office and commercial premises to the south.



**Figure 2 Site Location and Local Road Network (Source: Google Earth)**

#### Local Road Network

The main entrance into the Grange Castle Business Park is from a roundabout junction on the R136 Grange Castle Road. Access to the business park from this junction consists of a wide dual carriageway road, with a 1.5m cycle track and 1.5m footpath set back from the carriageway on either side.

The business park is also accessed via a 9m wide single carriageway road which forms a roundabout junction with the R134 Nangor Road.

The site of the proposed data centre is currently accessed from the internal Grange Castle Business Park road network via the roundabout junction on the R136 Grange Castle Road or via the roundabout junction on the R134 Nangor Road. There was previously a site access off R120, but this has now been



closed with the exception of facilitating local access to the property to the immediate south of this former access.

The roads and services of the business park were constructed in the late 1990's. The site location and local road network are shown on Figure 2 above.

The R136 forms a grade separated junction with the N4 approximately 3km north of its roundabout junction with Grange Castle Business Park, as well as the N7 approximately 3km to the south. The site is also in close proximity to the R134 and R132 regional roads, forming the primary routes from Grange Castle to Adamstown and Clondalkin respectively.

The M50 is located approximately 5km to the east of the site and forms an orbital motorway ring road around Dublin. The M50 is intersected by the principal radial routes, including the N4 at Junction 7, and the N7 at Junction 9, also known as the Red Cow Interchange. It is concluded that the site is strategically situated to facilitate trips by vehicle, with road infrastructure in place and built to a high standard

## 2.2 Existing Traffic Flows

A planning search was undertaken for recent applications that would include baseline traffic data for the site. This method was agreed for previous applications with the Senior Executive Engineer of South Dublin County Council's Land Use Planning & Transportation Department. The search returned a planning application for a Microsoft Data Centre (Reg. Ref. – SD15A/0133) located at Grange Castle Business Park (GCBP).

Traffic surveys were undertaken in support of the planning application at both roundabouts which form the accesses to the park. The surveys were undertaken midweek between 07:00- 10:00 & 16:00-19:00 on the 14th of May 2015, and growth factors have been applied in accordance with National Road Authority 'Future Traffic Growth Forecasts 2002-2040' published by the National Roads Authority to provide baseline traffic flows for 2018. The resultant data has been taken from the Traffic Chapter of the relevant EIS.

A summary of the survey results is presented below in Table 1 for the R136 roundabout and Table 2 for the R134 roundabout. On site observations indicate that both junctions are working well within capacity with minimal queuing and delay.

	Total Junction Flow	GCBP Two-way Flow	% GCBP Traffic
	(PCUs)	(PCUs)	
AM Peak Hour (08:00 - 09:00)	2704	615	22.7%
PM Peak Hour (17:00 - 18:00)	2633	606	23%

**Table 1 Existing traffic flows at R136 / Grange Castle Business Park Roundabout**

	Total Junction Flow	GCBP Two-way Flow	% GCBP Traffic
	(PCUs)	(PCUs)	
AM Peak Hour (08:00 - 09:00)	1648	405	25.6%
PM Peak Hour (17:00 - 18:00)	1263	388	30.8%

**Table 2 Existing traffic flows at R134 Nangor Road / Grange Castle Business Park roundabout**

The locations of the surveys are each pertinent to the proposal in terms of being at key nodes in the road network that would be affected by traffic assignment and distribution of flows associated with the development site.



## 2.3 Public Transport

### 2.3.1 Introduction

Local public transport nodes are illustrated in the figure below.



**Figure 3 Local public transport nodes**

### 2.3.2 Bus

There are two bus stops adjacent to the Pfizer site within Grange Castle Business Park, which are within a walking distance of 100m (No. 13) and 1.2km from the site (No. 151/68), which has an associated walking time of around 1 minute and 14 minutes respectively. Dublin Bus services 13 and 151 serve these bus stops, with further details shown in Table 3 below.

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	20min	
151	Docklands – Dublin City Centre – Clondalkin – Grange Castle Business 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	Hawkins St. Towards Newcastle / Greenogue Business Park	Hawkins St	First	06:25	06:40	9:00
			Last			
		Newcastle Greenogue Business Park /	First	06:00	06:35	10:15
			Last			
		Frequency	60mins	60mins	60 mins	

**Table 3 Existing Dublin Bus services to Grange Castle Business Park**

The above table illustrates that there are regular services on all days which route to the existing bus stops. Additionally, a bus terminus has been constructed within the Grange Castle Business Park to facilitate the operation of the No.13 service. The route of the No.13 service and No.151 services are shown on Figure 3 & 4 below.





Figure 4 No. 151 Service (Source: Google Earth)

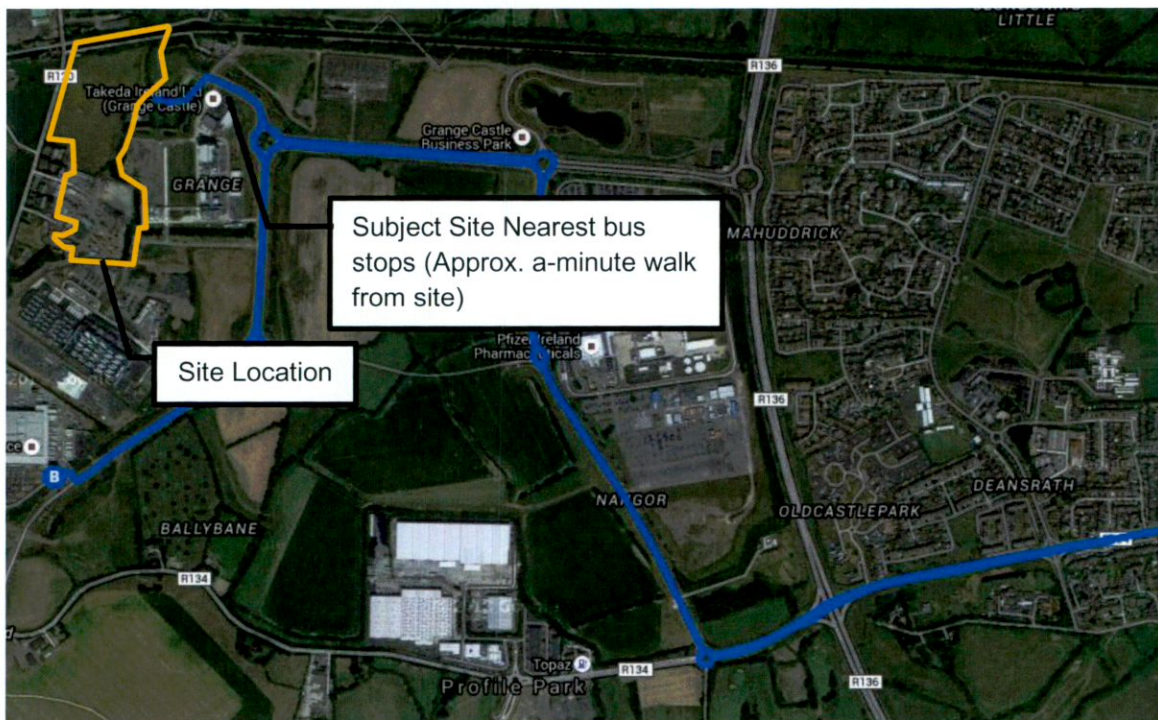


Figure 5 No. 13 Service (Source: Google Earth)

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



The nearest railway line runs east-west approximately 600m north of the site. Intercity services to Cork and Limerick run on this line, as well as commuter railway services to Portlaoise. The nearest stations are Adamstown, approximately 2km to the north-west of the site and Clondalkin Fonthill approximately 3km to the north-west of the site. These stations are served by around 20 suburban commuter trains in each direction during weekdays.

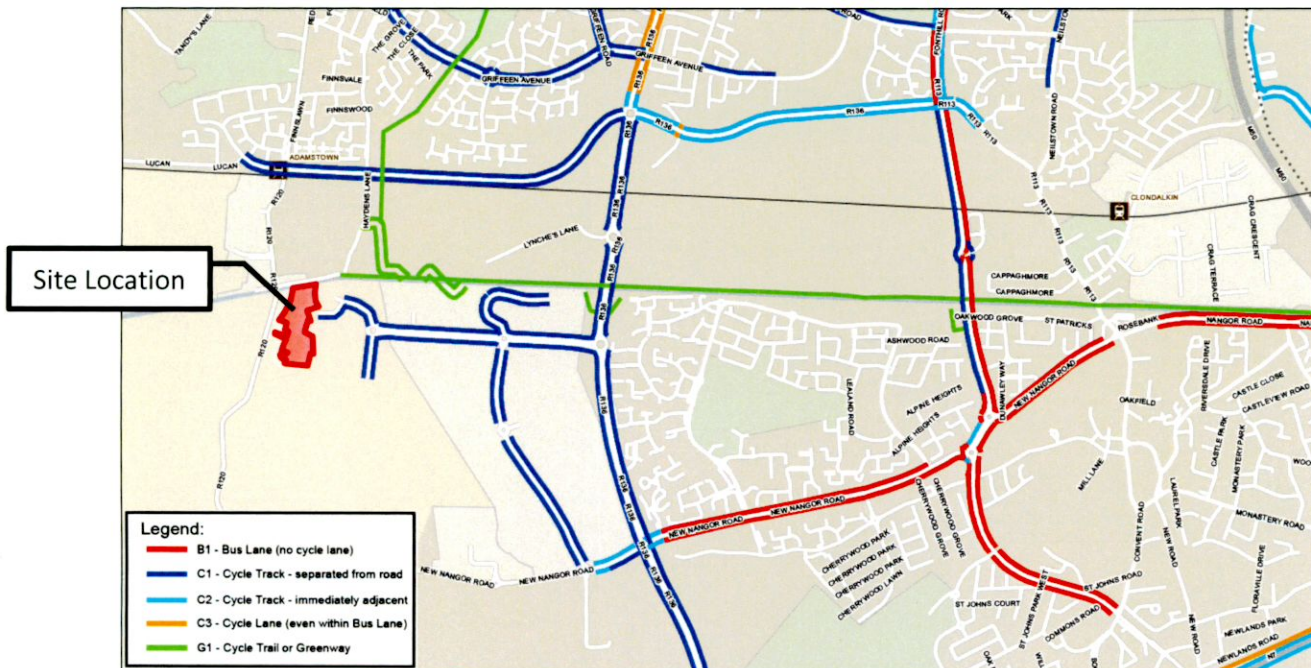
A new railway station has been constructed at Kishogue, approximately 1km northeast of the site. However, although Kishogue Station was completed in 2009 it is not operational, and additional infrastructure is required at the station.

## 2.4 Walking and Cycling

Footway and cycleways are available on all internal roads within Grange Castle Business Park, including on the road which is to be used for access to the site. These routes are approximately 1.5m wide for pedestrians and 1.5m wide for cyclists, separated from the road by a 2.0m wide verge.

Segregated cycle and pedestrian routes are also available on the R136 Outer Ring Road. East of the R136/R134 junction, cyclists are permitted to use the bus lane on New Nangor Road, towards Clondalkin and Dublin City Centre. The proposed realignment of the Nangor and Newcastle/Lucan Road includes the provision of new footpaths and cycle tracks in both directions.

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



**Figure 6 Existing Cycle Routes (Source: NTA)**

The Grand Canal Greenway runs from east – 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.

## 2.5 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 to 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 7.



No collisions have been reported in the vicinity of the proposed development.

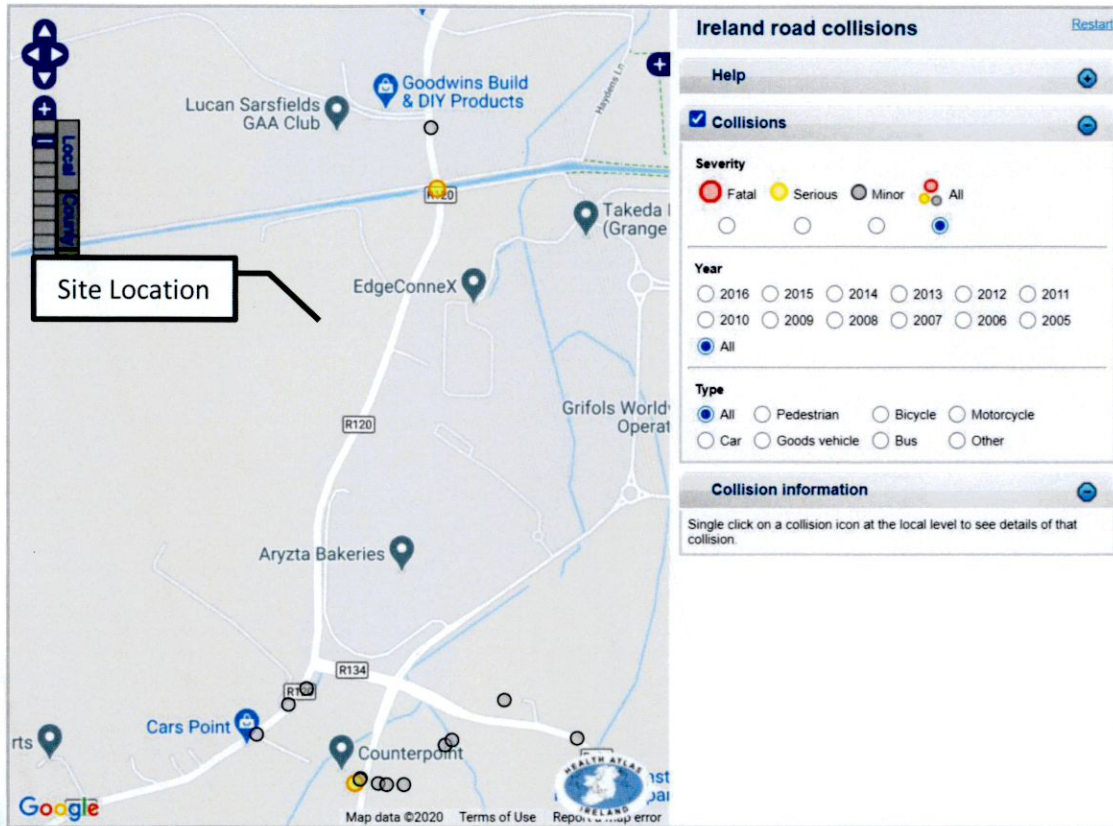


Figure 7 Road Collisions (Source: RSA)

**2.6 Summary**

In summary, the site has a large employment setting with corresponding public transport and infrastructure provision.

### **3 PROPOSED DEVELOPMENT**

#### **3.1 General**

The site subject of this Traffic and Transport Assessment is the combination of various previously granted schemes.

These schemes are summarised below:

- EDCDUB1.1 – Total GFA 5776 m<sup>2</sup> / Office GFA 778 m<sup>2</sup>
- EDCDUB1.2 – 4176 m<sup>2</sup> / No staff/admin area
- EDCDUB2.1 – 2256 m<sup>2</sup> / No staff/admin area
- EDCDUB2.2 – 3232 m<sup>2</sup> / Office GFA 287 m<sup>2</sup>
- EDCDUB03 – 4294 m<sup>2</sup> / No staff/admin area

There are 49 No. car parking spaces on site comprising the following:

- 4no. Wheelchair Spaces,
- 45no. car parking

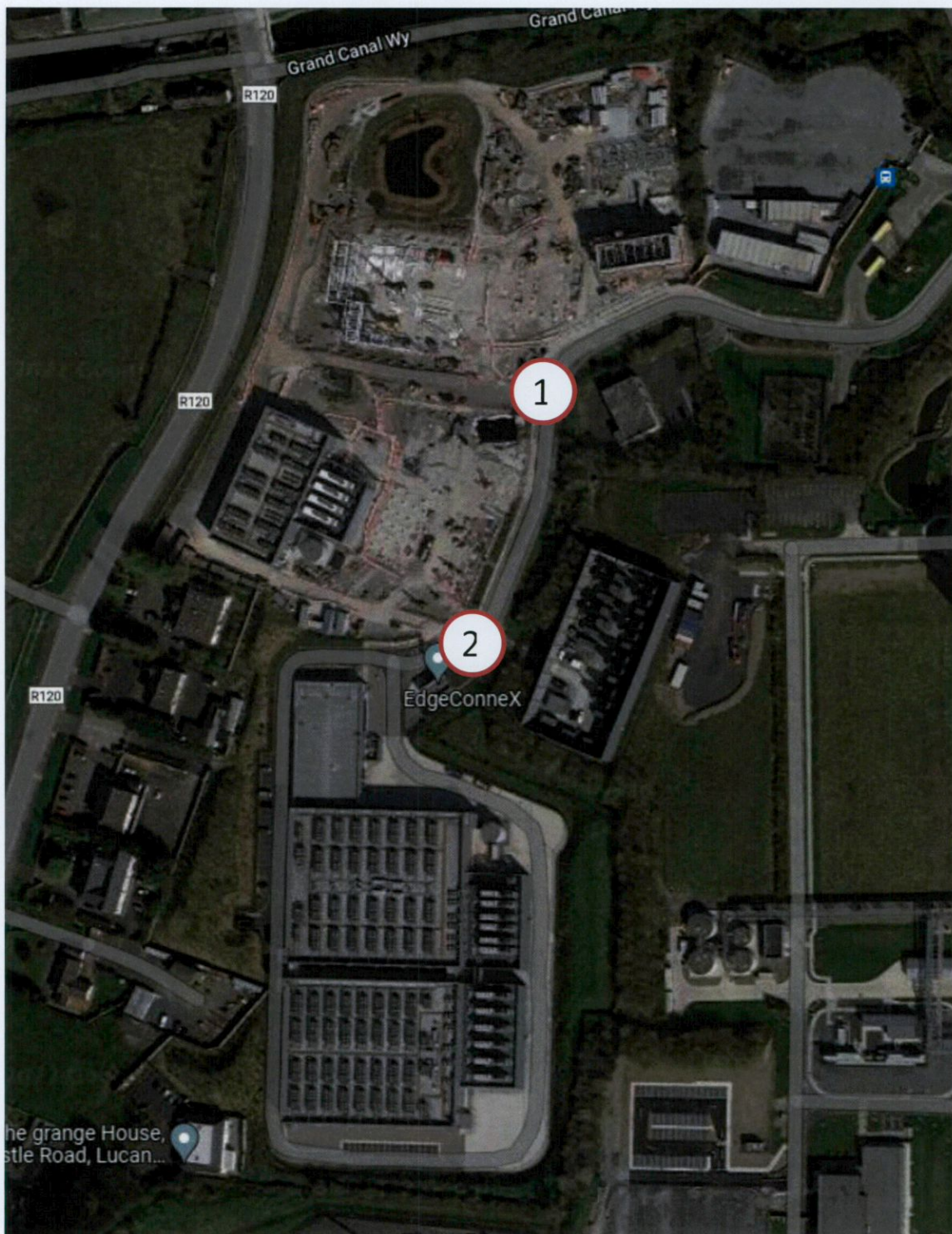
There is a total of 16 No. cycle stands on site.

Refer to the planning history for relevant permissions.

#### **3.2 Site Access**

The original campus had proposed 2 No. all movement access points as illustrated below.



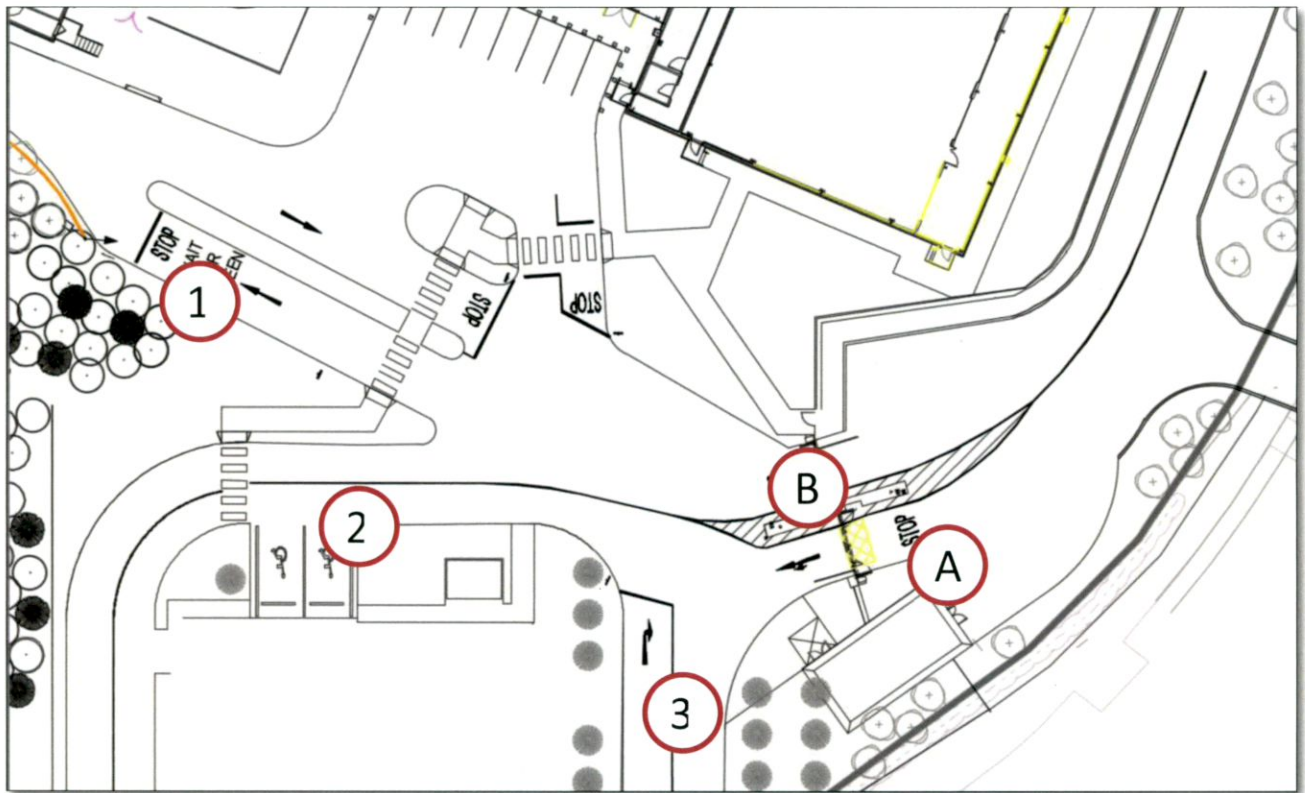


**Figure 8 Access locations**

As part of this application, Access No. 1 will be reserved for emergency vehicle access and abnormal load access only.

Access No. 2 will provide primary access to the entire campus as illustrated below.





**Figure 9 Primary Access Layout**

A summary of the primary access is outlined below:

- **A** – all vehicles enter the site via the security gate
- **B** – all vehicles leave the site via the security gate
- **1** – Vehicles traveling to the northern half of the campus do so via a metered system. The route to the northern half of the campus is narrow and it is not possible to have two-way traffic. This route involves a signalised system that will meter access to the access route. No vehicles will be allowed to enter the system unless they have a signal to proceed.
- **2/3** – Vehicles traveling to the southern half of the campus do so via Route 2 or 3.

### 3.3 Servicing

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

Refer to the accompanying AutoTrack analysis for further information.

### 3.4 Parking Provision

There are 49 No. car parking spaces on site comprising the following:

- 4 4no. Wheelchair Spaces,
- 5 45no. car parking

There is a total of 16 No. cycle stands on site.



## 6 TRAFFIC GENERATION AND DISTRIBUTION

### 6.1 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 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.

### 6.2 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 EdgeConnex.

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 employ people working in 3 shifts as follows:

- 08:00-16:00
- 16:00-00:00
- 00:00 – 08:00

**Note:** the 00:00-08:00 shifts would have 50% of the daytime operational shift.



The number of trips generated by these employees is limited on the available number of car parking spaces i.e., 49 No. car parking spaces. In this instance during the first shift change, 25 cars will leave the development and 49 cars will arrive. This sets the peak hour trips for the development.

The proposed peak hour trip rates are shown in Table 4 below.

Typical Trip Generation	AM Peak (08:00 – 09:00)		PM Peak (17:00-18:00)	
	Departures	Arrivals	Departures	Arrivals
Staff	20	49	0	0
<b>Total</b>	69		0	

**Table 4 Predicted staffing requirements**

### 6.3 Traffic Generation

Due to the shift patterns of the site, the AM Peak hour will have 49 arrivals and 20 departures resulting in a total of 69 two-way trips.

The shift change occurs at 16:00 which would be outside the traditional PM Peak between 17:00 and 18:00. It is therefore assumed that the development will have no impact on the PM Peak.

Additionally, it is assumed that all staff will travel by car, with an occupancy rate of 1 per vehicle. Again, this is unlikely in reality, but will provide a robust assessment.

A small number of deliveries such as post, couriers, IT equipment and general office supplies will be required during the operational phase of the proposed development. It is assumed that this will occur throughout the day with negligible impact on the respective peaks as these will be diverted and/or pass by trips.

Whilst provision would be made for customer service staff at the proposed data centre, this service will be undertaken via telephone / remote IT support, without the need for regular visitors to the site. It is therefore assumed that no visitors will require access to the site in the AM or PM peak hours.

### 6.4 Traffic distribution

It is expected that the origins and destinations of traffic to/from the proposed development will be similar to the distribution of traffic currently accessing Grange Castle Business Park. The assumed distribution is summarised as follows:

- 60% to and from R136 Outer Ring Road and
- 40% to and from R134 Nangor Road

### 6.5 Transport Infrastructure Ireland (TII) Threshold Assessment

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

The existing background traffic flows been set out in earlier sections of this chapter and are reproduced below.

Table 5 below indicates the percentage impact of the overall additional traffic at the R136 / Grange Castle Business Park Roundabout Junction, as well as the percentage increase in traffic on the Grange Castle Business Park (GCBP) arm.



It assumed that the trip distribution is based on existing flow patterns i.e., total flow through each of the access.

	<b>Total Junction Flow (PCUs)</b>	<b>GCBP Two-way Flow (PCUs)</b>	<b>% GCBP Traffic</b>
R136 / Grange Castle Business Park Roundabout	2704	42	1.6%
R134 Nangor Road / Grange Castle Business Park Roundabout	1648	27	1.6%

**Table 5 Percentage impact of data centre at local junctions**

The impact of traffic associated with the proposed **overall** development is approximately 1.6% of the existing background flows at the junction of the R136 Grange Castle Business Park Roundabout.

The impact of traffic associated with the proposed development is approximately 16% of the existing background flows at the junction of the R134 Nangor Road Roundabout.

These criteria are widely considered to be best practice in determining the scope for road capacity impacts.

At a maximum of 67 two-way trips in each of the peak hours for the overall development, the proposed development has a traffic generation less than the first criterion of 10% set out above. Additionally, the proposed development is forecast to have a maximum percentage impact of around 1.6% at junctions in the vicinity of Grange Castle Business Park, which is again less than the criteria set out by TII.

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.

## **7 SUMMARY AND CONCLUSION**

### **7.1 Executive Summary**

This Transport Assessment has been prepared to assess the cumulative impact of a data centre campus located at Grangecastle, Co. Dublin.

### **7.2 Development Access**

The data centre campus will have 2 No. access points. One will be primary access point where all site traffic will have to enter in order to gain access. The secondary access will be for emergency vehicle and abnormal load vehicles only.

### **7.3 Parking**

There are 49 No. car parking spaces on site comprising the following:

- 4 4no. Wheelchair Spaces,
- 5 45no. car parking

There is a total of 16 No. cycle stands on site.

### **7.4 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. Refer to the included Pinnacle Engineering drawings for further details.

### **7.5 Trip Generation**

For the scale and type of development proposed, it is expected that the development will generate 49 new trips in the AM peak hour.

### **7.6 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.

### **7.7 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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