Waterman Moylan
Engineering Consultants

Tack Sandyford SHD

Traffic & Transport Assessment (T&TA)

March 2022

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Comments

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1. Introduction

1.1 Introduction

This Traffic and Transport Assessment (T&TA) has been prepared by Waterman Moylan on behalf of Sandyford Environmental Construction Ltd to accompany an SHD application to An Bord Pleanala (ABP) for a residential development on a brownfield site at the junction of Carmanhall Road and Ravens Rock Road, Sandyford, Dublin 18. See Figure 1.

The subject site is located at Sandyford in south County Dublin at the junction of Carmanhall Road and Ravens Rock Road, Sandyford, Dublin 18. The existing access to the site is from Ravens Rock Road. See Figure 1.

The site has an area of 0.57ha (1.4 acre) but for the purpose of encompassing the proposed access junctions, services connections and landscaping, the area within the red line for the planning application has been extended to 0.7ha.

The site was formerly occupied by Tack Packaging but at the time of writing in March 2022, it was unoccupied save for a number of empty buildings.

The adjoining site to the east at the junction of Carmanhall Road and Blackthorn Road was formerly occupied by Avid Technology. It extends to 0.81 ha ((2.0 acre). See Figure 2.

During the preparation of the T & TA for this development, two alternative scenarios were considered as part of the assessment of the traffic impact of this development. Firstly, to assess the traffic impact of a residential development on the subject site. Secondly, to assess the subject site in conjunction with the adjoining site as a single development for traffic purposes. For reasons of this latter option was selected and the developments on the two sites assessed as a single development on a single site.

1.2 Threshold for Traffic and Transport Assessment

Sections 8.2.4.2 and Appendix 10 of the Dun Laoghaire Rathdown County Development Plan 2016 – 2022 specify that that a Traffic & Transport Assessment is required where an existing or proposed development has significant car trip potential and meets one or more of the following thresholds: -

- Traffic to and from the development exceeds 5% of the traffic flow on the adjoining road or 100 trips in the peak hours
- Residential development of 200 residential units or more

1.3 Standards

This T & TA has been prepared in accordance with Traffic and Transport Assessment Guidelines (2014) issued by Transport Infrastructure Ireland (TII).

It includes a projection forward 5 years and 15 years after the opening date in accordance with the TII Traffic and Transport Assessment Guidelines and the UK's Institution of Highways and Transportation Guidelines and in its analysis considers all major new road and traffic schemes and existing and proposed developments in the area.

The Traffic and Transport Assessment (T&TA) for this development is expected to be accompanied by a Travel Plan (formerly Mobility Management Plan) prepared in accordance with Section 8.2.4.3 of Dun Laoghaire Rathdown County Development Plan 2016 – 2022.

1.4 Program

At the time of writing in March 2022, it is likely that construction of the proposed development could commence in 2023 for completion in 2026.

Projections are included for Design Year 2031 (Opening Year + 5) and Future Year 041 (Opening Year + 15).

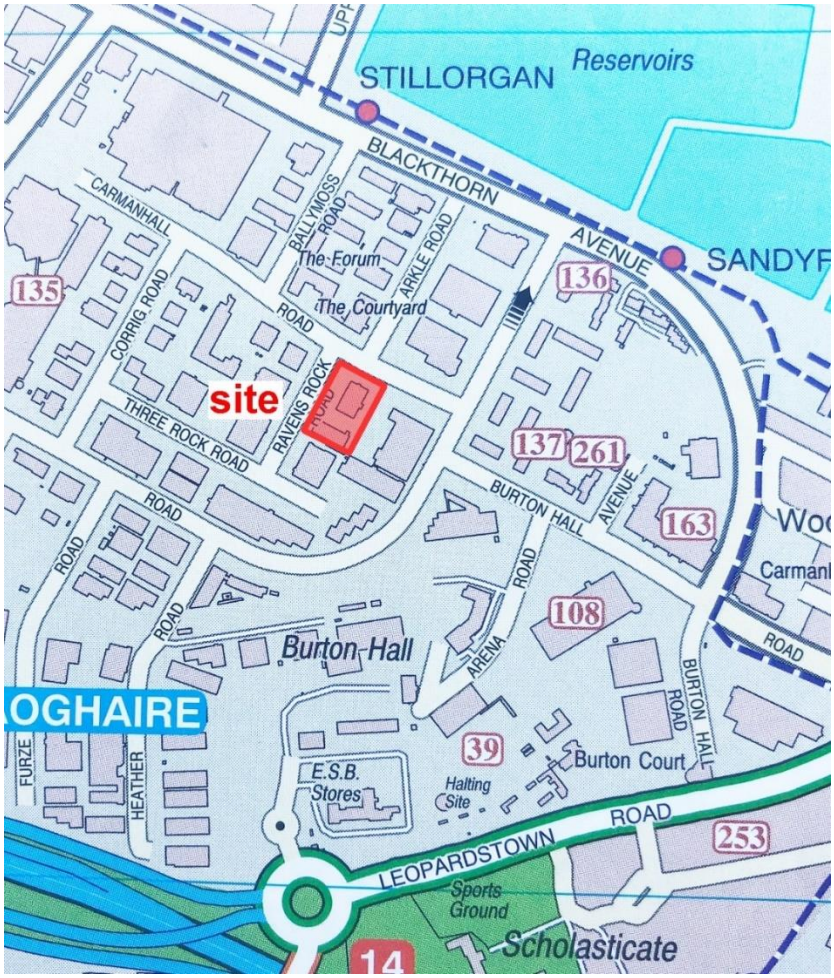

Figure 1 Location Map

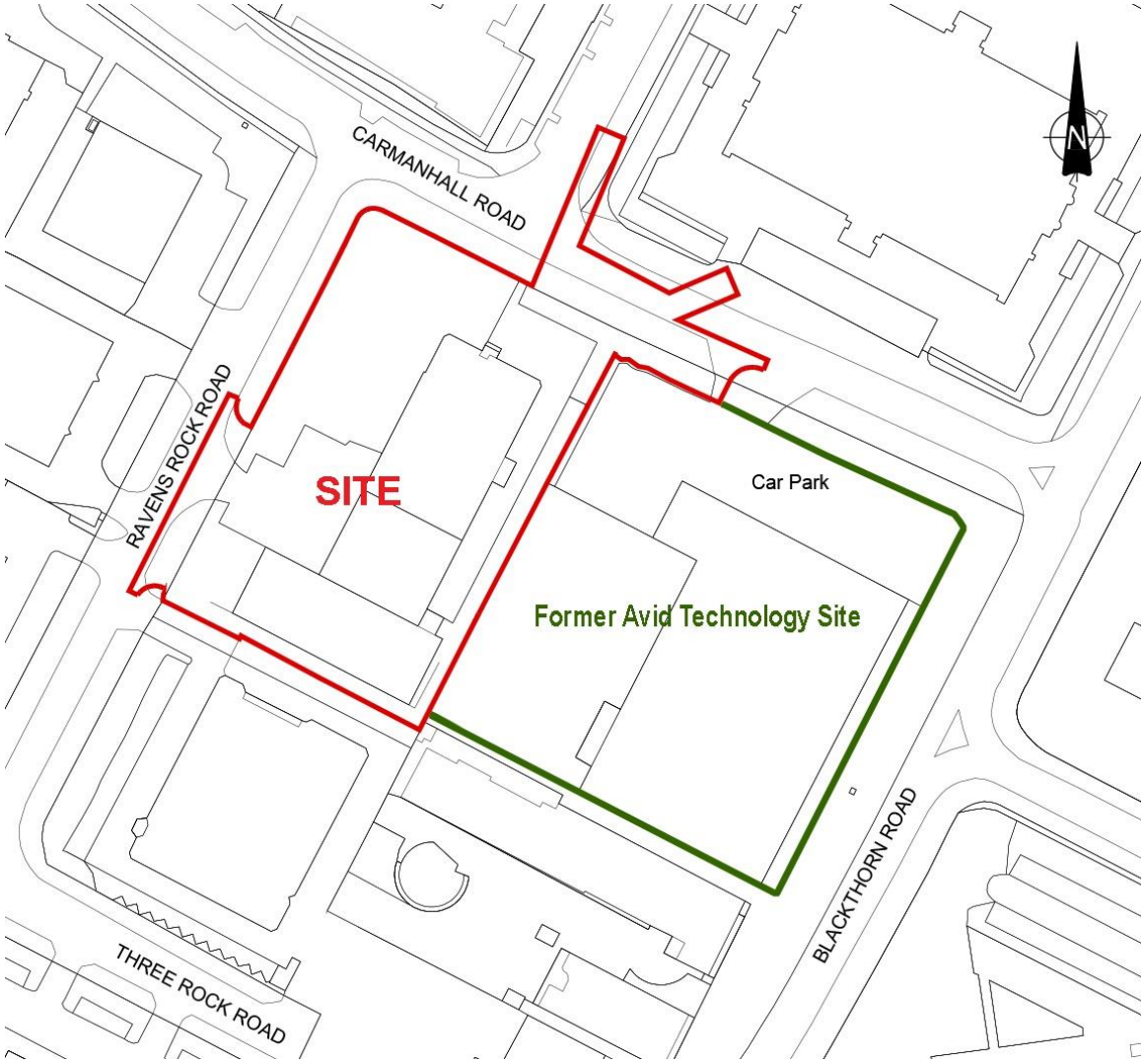

Figure 2 Location of Tack Packaging and Avid Technology Sites

2. Proposed Development

2.1 Description

The proposed development will comprise some 207 Build-to-Rent residential units with a Creche (306 sqm) and Shared Amenity Space (415 sqm). See Figure 3.

Car parking with a total of 79 car spaces will be provided at Lower Ground Level and Basement. Cycle parking with 288 spaces will be provided at Lower Ground Level. Access for vehicular traffic is proposed from Ravens Rock Road with egress onto Carmanhall Road.

The public realm around the site will incorporate an upgrade of the pedestrian and cycle environment.

The development includes all associated infrastructure to service the development including access junctions, footpaths and cycle paths together with a network of watermains, foul water drains and surface water drains.

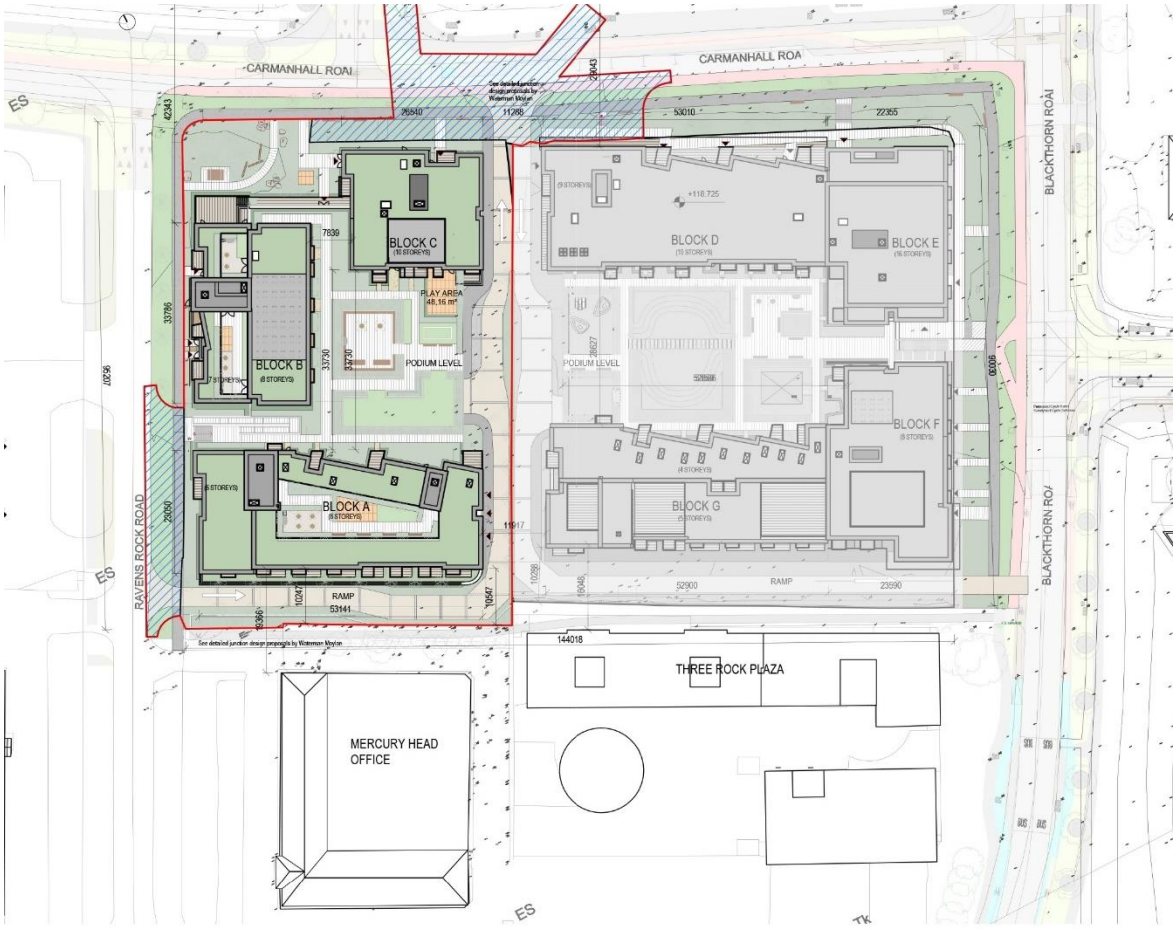

Figure 3 Proposed Site Layout

2.2 Contiguous Development

A concurrent development with a separate Traffic & Transport Assessment on the former Avid Technology site to the east will comprise 336 Build-to-Rent residential units and 118 car parking spaces at Lower Ground Level and Basement. Access is proposed from Carmanhall Road and egress onto Blackthorn Road.

The traffic impact from this contiguous development has been incorporated into this T&TA.

2.3 Future Road and Cycle Schemes

During the preparation of this T & TA, Waterman Moylan were in contact with DLRCC Transportation in relation to two schemes which are being developed by Dun Laoghaire Rathdown County Council. These were : -

(a) ESB Link Road – Junction 14 Roundabout to Blackthorn Road.

(b) Sandyford Business District Pedestrian and Cycle Improvement Scheme.

Both schemes and their impact on the road network in the area of the subject site are described in this T & TA.

It is understood at the time of writing in March 2022, that both schemes are progressing to the tender stage for completion in 2023.

2.4 Access

Vehicular access to the proposed development is proposed Ravens Rock Road and egress onto Carmanhall Road. See Figures 3 and 4.

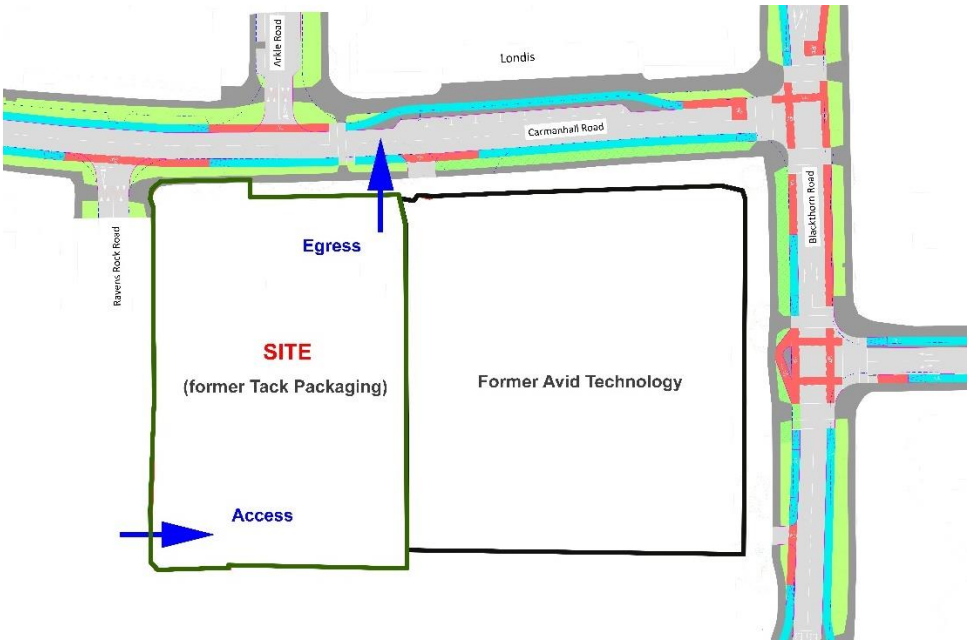

Figure 4 Proposed Access

2.4.1 Proposed Access on Ravens Rock Road

An entrance only access is proposed on Ravens Rock Road for cars, service deliveries, refuse freighter and emergency vehicles. See Figure 3.

2.4.2 Proposed Access on Carmanhall Road

An exit only for all vehicles is proposed onto Carmanhall Road immediately to the west of the boundary between the subject site and the adjoining Avid Technology site to the east. See Figure 3.

No constraint is expected from the existing signalised pedestrian crossing which is located immediately to the west of the existing access. It is proposed that this crossing be relocated as part of the Sandyford Business District Pedestrian and Cycle Scheme. See Figure 5.

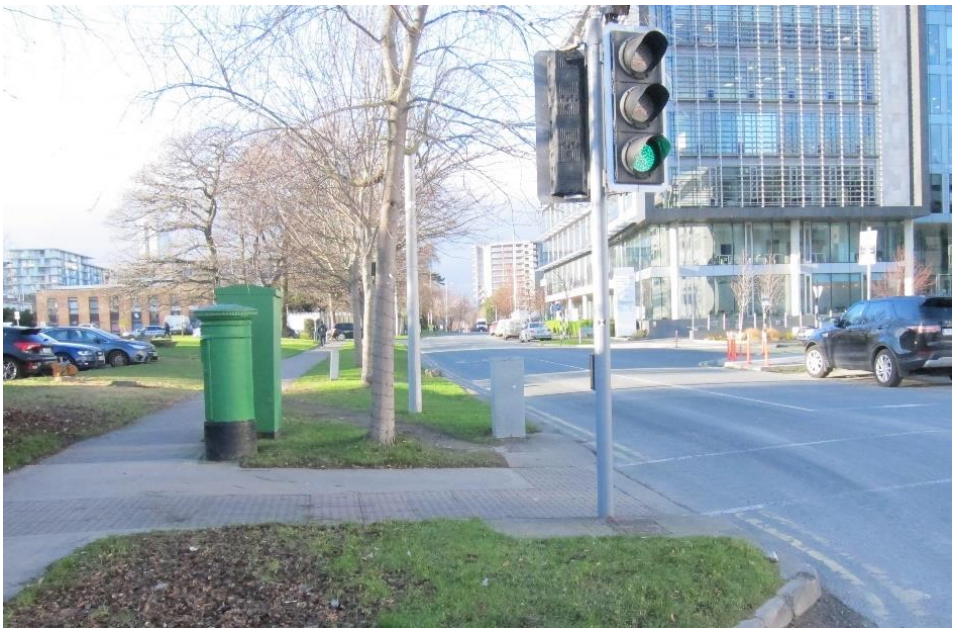

Figure 5 Pedestrian Crossing and Trees in Sightline at Carmanhall Road

2.4.3 Sightlines at Carmanhall Road

The sightlines for the proposed exit from this development onto Carmanhall Road are shown in Figure 6. They have been based on Section 4.4.5 of the Design Manual for Urban Roads and Streets (DMURS) which requires

- A setback of 2.4m from the edge of the carriageway at the junction.
- Sightlines of 45m for roads with a 50kph design speed such as Carmanhall Road.
- Sight distance to the left to the centreline of the road and sight distance to the right to the nearside kerb line.

Two trees at the Carmanhall Road access are likely to be affected by the sightlines, one on either side of the new entrance. The affected trees can be seen in Figure 5.

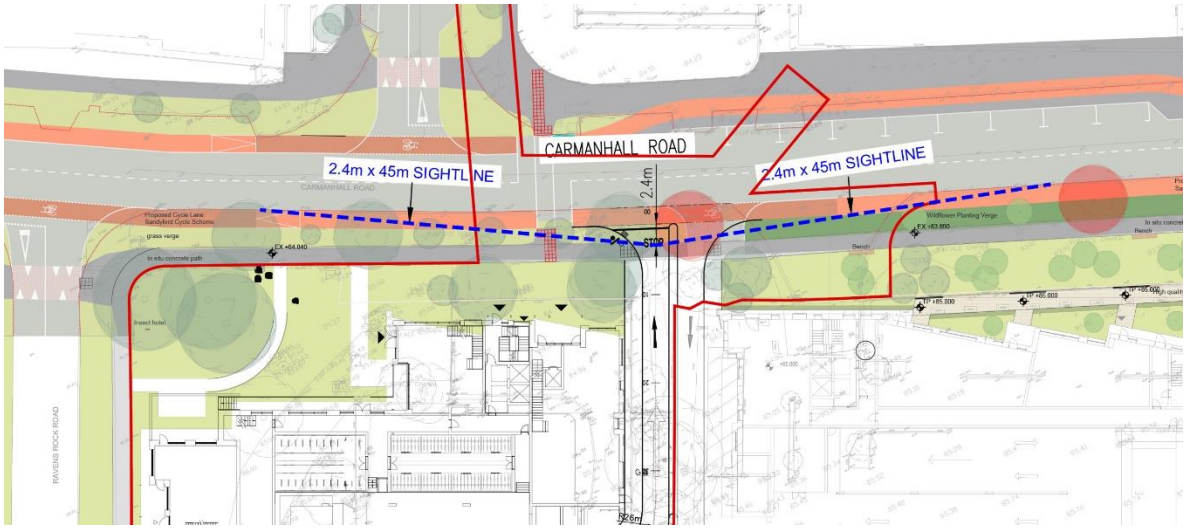

Figure 6 Proposed Sightlines on Carmanhall Road.

2.5 Internal Road Layout

The internal road layout and possible future connection to the future internal road layout within the former Avid Technology site to the east is shown on Waterman Moylan Drg No 21-118/P101 reproduced in Figure 7.

This drawing also shows the proposed junctions on Ravens Rock Road and Carmanhall Road.

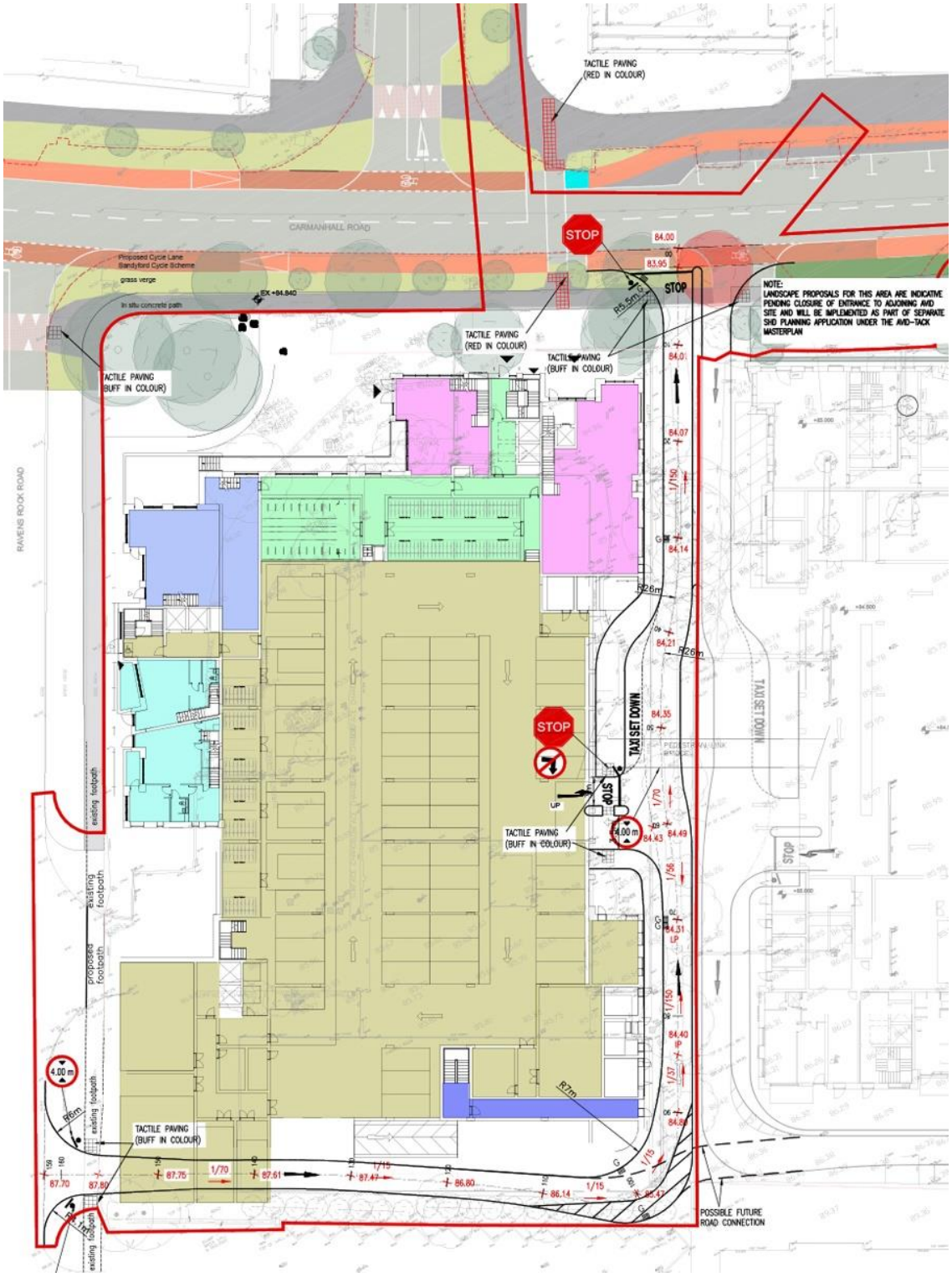

Figure 7 Proposed Internal Roads

2.6 Design Population

It is estimated that the number of residents in the proposed development on the subject site will be some 479 persons with 543 persons in the contiguous development on the adjoining Avid site giving a combined total of some 1,217 persons as calculated in Table 1.

Table 1 Development Population

Unit Size					Total	
	Units	Persons	Units	Persons	Units	Persons
Studios (1-person)	48	48	76	76	124	124
1-Bed (2 persons)	103	206	189	378	292	584
2-Bed (4 persons)	55	220	71	284	126	504
3-Bed (5 persons)	1	5	0	0	1	5
Total	207	479	336	738	543	1,217

2.7 Car Parking

The proposed provision of car parking on the subject site will be 79 spaces calculated at the rate of 0.35 space per unit per unit for 207 units.

The provision of 79 spaces will include 4 spaces for disabled drivers (4%), 8 spaces with charging facilities for electric vehicles (10%) and 2 spaces for car sharing (GoCar).

A total of 56 spaces will be located at Lower Ground Level as shown in Figure 8 with a total of 23 spaces at Basement Level as shown in Figure 9.

On the adjoining Avid site, 65 spaces are expected to be provided at Lower Ground Level with at 53 spaces Basement Level.

Provision has been included in the design for interconnection between the two car parking areas at Lower Ground Level but not at Basement Level.

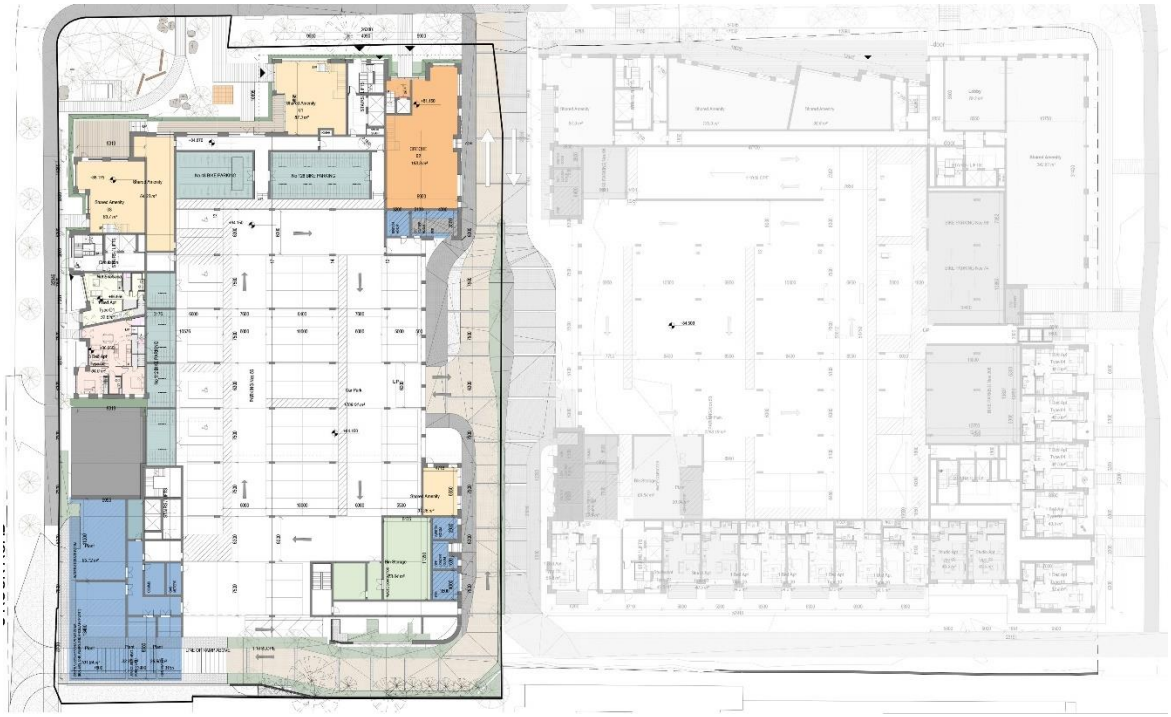

Figure 8 Parking Layout at Lower Ground Level (56 spaces)

Figure 9 Parking Layout at Basement Level (23 spaces)

2.8 Motorcycle Parking

The parking provision for motorcycles within the proposed development will be 3 spaces (4% of the car parking provision).

2.9 Pedestrians and Cyclists

The pedestrian and cycle access to the proposed development have been integrated with the proposals for the Sandyford Business District Pedestrian and Cycle Improvement Scheme. 2021.

This scheme provides for upgraded footpaths and cycle tracks on the Blackthorn and Carmanhall Road frontages of the subject site together with the signalisation of the Blackthorn Road / Carmanhall Road junction.

2.10 Cycle Parking

It is proposed that a total of 288 cycle parking spaces be provided within the proposed development.

A total of 240 long term spaces will be provided for residents and a total of 48 short term spaces will be provided for visitors.

Provision for future additional demand for cycle parking of 40 spaces has been included in the cycle parking provision for this development.

2.11 Waste Collection

An Autotrack analysis has been undertaken on the proposed layout to demonstrate that a 10.2m long refuse freighter can access the proposed development from Ravens Rock Road, drive through the development and exit onto Carmanhall Road.

The Autotracking which is illustrated in Figure 10 and on Waterman Moylan Drg No 21-118/P172 confirms that the selected vehicle can access the proposed development.

2.12 Emergency Access

An Autotrack analysis has been undertaken on the proposed layout to demonstrate that an 8.4m long Class B fire tender can access the proposed development from Ravens Rock Road, drive through the development and exit onto Carmanhall Road.

The Autotracking which is illustrated in Figure 11 and on Waterman Moylan Drg No 21-118/P170 confirms that the selected vehicles can access the proposed development.

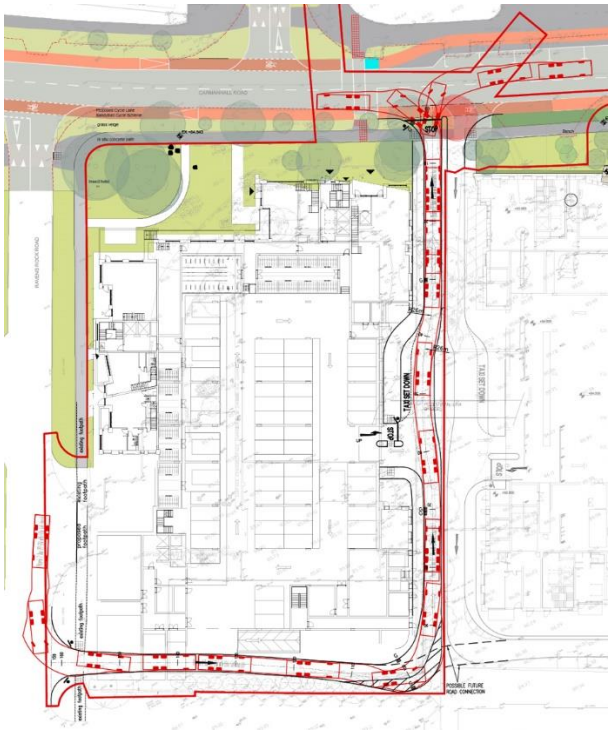

Figure 10 Autotrack Tracking for Refuse Freighter

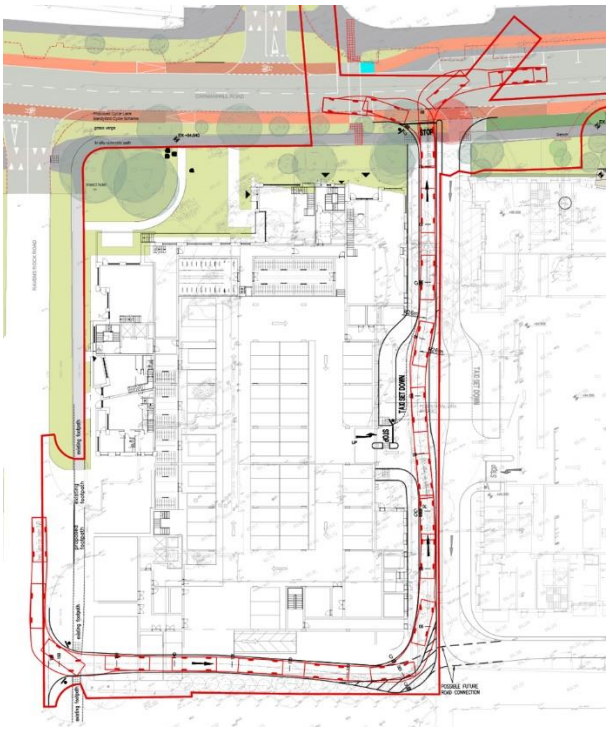

Figure 11 Autotrack Tracking for Fire Tender

2.13 Travel Plan (formerly Mobility Management Plan)

The Traffic and Transport Assessment (T&TA) for the proposed development is accompanied by a Travel Plan prepared in accordance with Section 8.2.4.3 of Dun Laoghaire Rathdown County Development Plan 2016 – 2022.

A separate Travel Plan is also expected to be prepared for the proposed development on the adjoining former Avid Technology site to the east.

3. Receiving Environment

3.1 Site Layout – Existing

The existing site layout is illustrated in Figure 12.

The subject the site extending to 0.57 ha (1.40 acres) was formerly occupied by Tack Packaging. The existing access is from Ravens Rock Road.

At the time of writing in March 2022, the site was unoccupied save for a number of empty buildings on the site.

The adjoining site to the east on which a concurrent development is expected extends to 0.81 ha (2.0 acres) and was formerly occupied by Avid Technology. The existing access is from Carmanhall Road

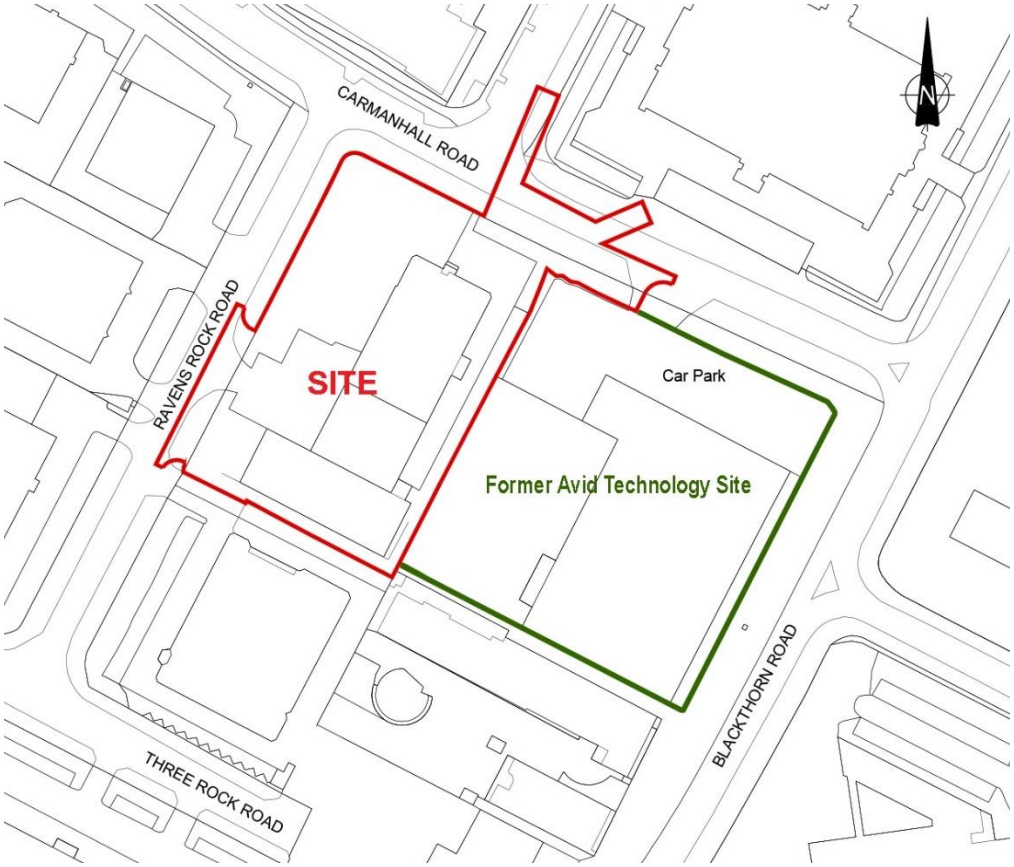

Figure 12 Site Layout – Existing

3.2 Existing Roads

The primary roads in the area of the subject site are shown on Figure 13. The roads which form its eastern, northern and western boundaries of the site are:

- Blackthorn Road
- Carmanhall Road
- Ravens Rock Road.

Figure 13 Sandyford Business Estate Road Hierarchy (SUFP Drawing No 7)

(Level 1 Roads in yellow and Level 2 Roads in pink)

Blackthorn Road is a Level 1 Local Road with a posted speed limit of 50 kph. It has a single carriageway 9.0 metres wide with grass verges and footpaths on both sides. There is a signalised junction with pedestrian facilities at Burton Hall Road and a priority junction at Carmanhall Road. See Figure 14.

The Average Annual Daily Traffic (AADT) on Blackthorn Road is some 17,500 vehicles per day. The two-way traffic flow on Blackthorn Road is some 1,230 vehicles per hour (vph) during the AM peak hour reducing to 450 vph during the PM peak hour.

Only very limited access and no parking is provided off Blackthorn Road.

Figure 14 Blackthorn Road

Carmanhall Road is a Level 2 Local Road with a posted speed limit of 50 kph. It has a single carriageway 7.5 metres wide with grass verges and footpaths on both sides. There are priority junctions with Blackthorn Road and Ravens Rock Road. There is also a signalised pedestrian crossing to the east junction with Ravens Rock Road. See Figure 15.

The Average Annual Daily Traffic (AADT) on Carmanhall Road is some 9,600 vehicles per day The two-way traffic flow on Carmanhall Road is some 650 vehicles per hour (vph) during the AM peak hour reducing marginally to 600 vph during the PM peak hour.

Parking on Carmanhall Road is limited to 1 hour controlled by Pay & Display 08h00-17h00 Monday – Saturday. Parking demand is high on weekdays.

Figure 15 Carmanhall Road

Ravens Rock Road is a Level 2 Local Road with a posted speed limit of 50 kph. It has a single carriageway 7.5 metres wide with grass verges and footpaths on both sides. There are priority junctions at both ends with Carmanhall Road and Three Rock Road. See Figure 16.

Parking on Ravens Rock Road is controlled by Pay & Display 08h00-17h00 Monday – Saturday. Parking demand is high on weekdays.

The Average Annual Daily Traffic (AADT) on Ravens Rock Road is some 1,900 vehicles per day. The two-way traffic flow on Ravens Rock Road is some 150 vehicles per hour (vph) during the AM peak hour. reducing marginally to 100 vph during the PM peak hour.

Figure 16 Ravens Rock Road

3.3 Site Access - Existing

There is a single vehicular access to the subject site from Ravens Rock Road.

There is also a single access to the adjoining former Avid Technology site from Carmanhall Road.

3.4 Pedestrian Linkage

3.4.1 Existing Environment – Pedestrians

Pedestrian facilities in the area surrounding the subject site are generally of high standard.

Street lighting and tactile paving are provided at most crossing points and footways are free of street clutter caused by inappropriately located street furniture.

3.4.2 Proposed Pedestrian Routes

In addition to the existing pedestrian facilities, the pedestrian environment in the area of the subject will be enhanced by the implementation of the Sandyford Business District Pedestrian and Cycle Improvement Scheme. See Figure 17.

3.5 Cycle Linkage

3.5.1 Existing Environment – Cycles

There are very limited cycle facilities on the road network in the area around the subject site.

This deficiency will be remedied by the implementation of the Sandyford Business District Pedestrian and Cycle Improvement Scheme.

3.5.2 Proposed Cycle Routes

The Council Cycling Policy, adopted in June 2010, provides local guidelines on the delivery of the aims and objectives of the National Cycle Policy Framework 2009-2020.

The Cycling Policy includes guidance and standards for the provision of cycle parking and associated cycling facilities for all new developments. Developments in the Sandyford Business District will be required to adhere to the Council Cycling Policy as part of their Travel Plan.

In addition to the existing pedestrian facilities, the cycle environment in the area of the subject will be enhanced by the implementation of the Sandyford Business District Pedestrian and Cycle Improvement Scheme. See Figure 17.

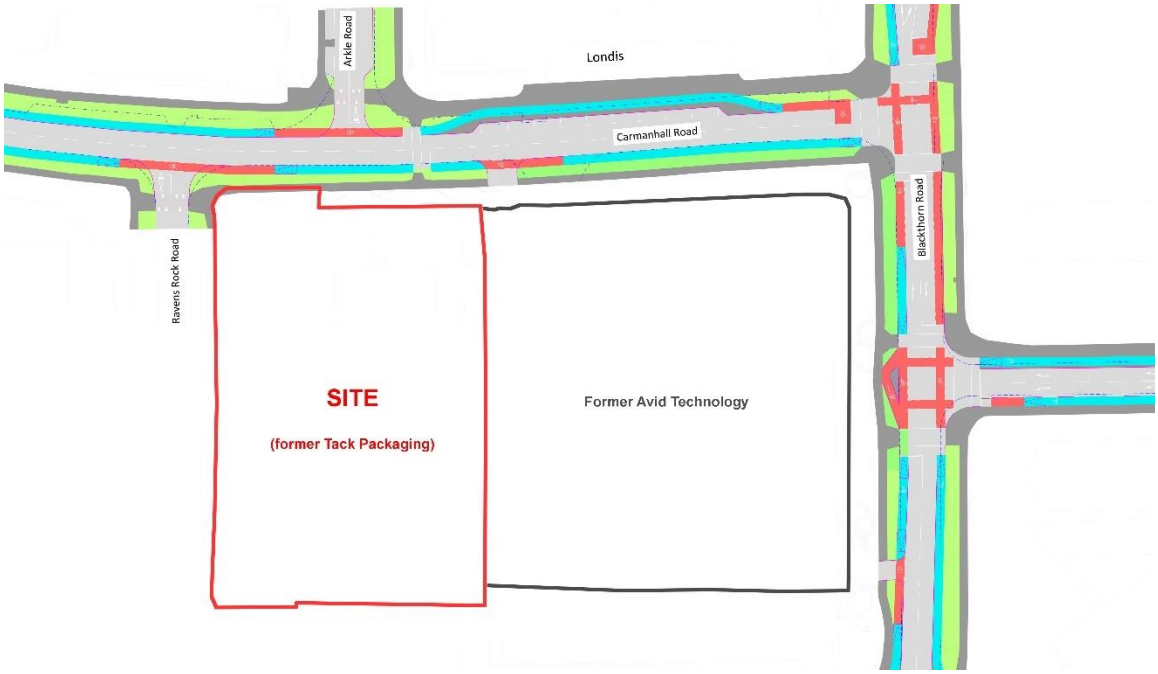

Figure 17 Sandyford Business District Pedestrian and Cycle Improvement Scheme

3.6 Car Sharing

The DLR County Development Plan is silent on the quantum of car club spaces to be provided within a new development.

A total of 2 spaces are proposed within this development to be operated by a company such as GoCar. GoCar bases in the area around the subject site are located within a short walking distance at the following locations illustrated in Figure 18.

- Carmanhall Road
- Blackthorn Avenue
- Blackthorn Road
- Heather Road

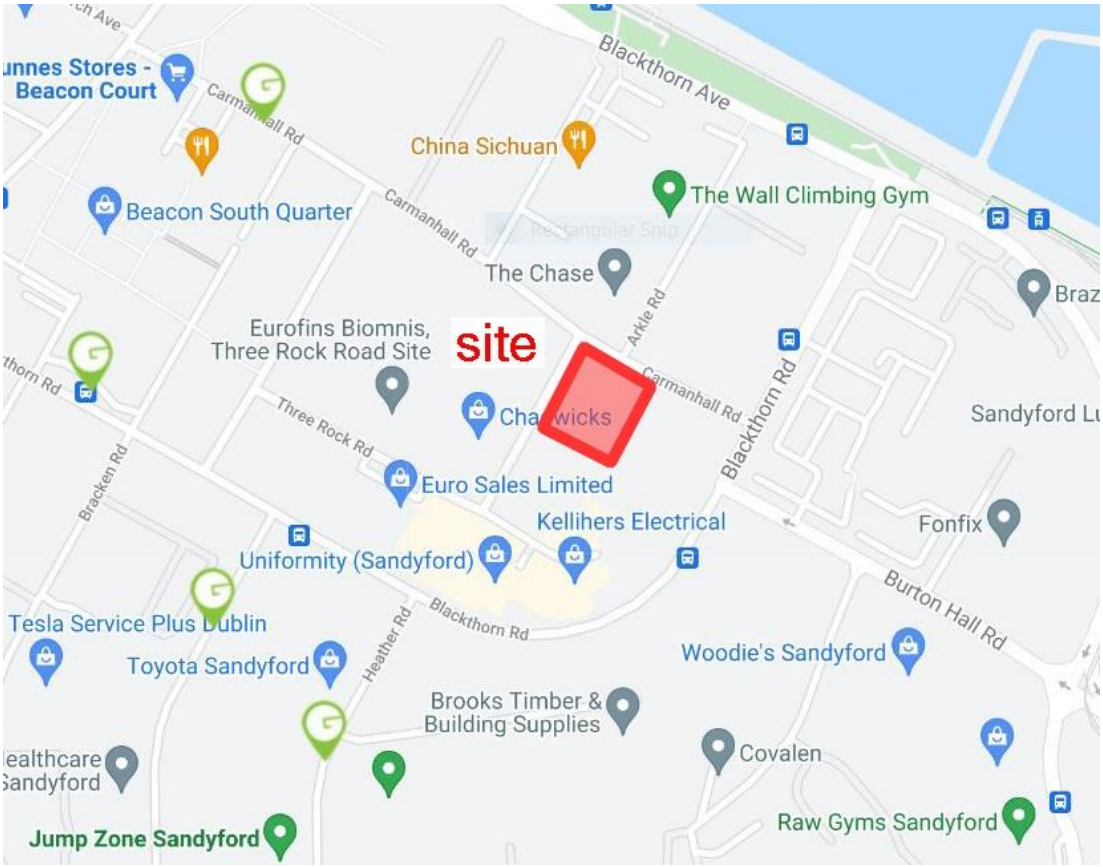

Figure 18 GoCar Bases in Sandyford Area.

3.7 Road Collision Statistics

Road traffic statistics for the area around the subject site were reviewed in the Road Safety Authority (RSA) website www.rsa.ie.

This website details traffic collision data for the years 2005 – 2016. The records detail only those occasions where the incident was officially recorded such as the Garda being present to formally record details of the incident.

The incidents are classified as fatal, serious or minor. An extract from the RSA collision map is presented in Figure 19.

None of the collisions were fatal or reoccurring or raise any concerns in relation to the existing road network.

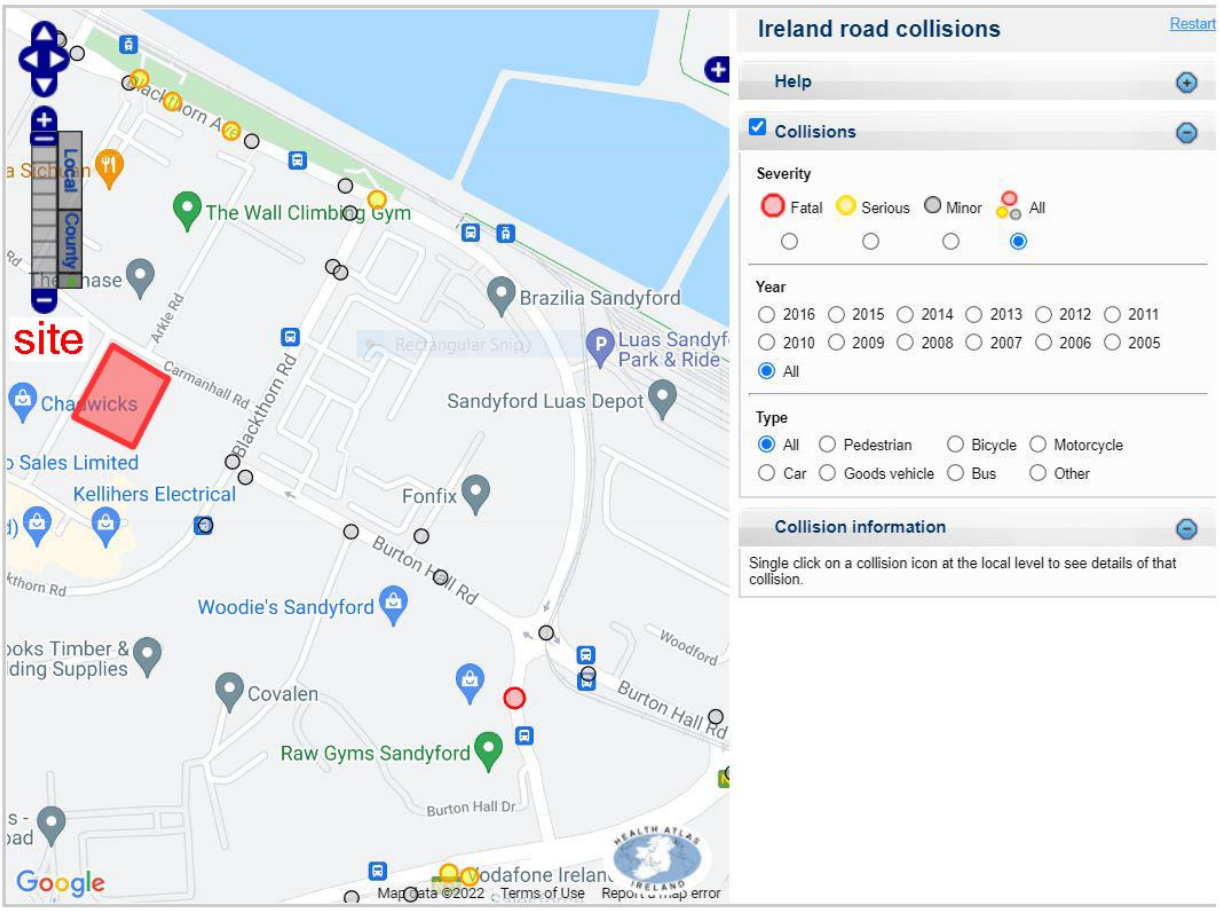

Figure 19 Road Traffic Collisions 2005 - 2016.

4. Public Transport – Light Rail

4.1 Background

Services on the Luas Green Line between St Stephens Green and Sandyford commenced in 2004. Subsequently, the line was extended south to Cherrywood in 2010 (Line B1) and north to Broombridge in 2017 (Line BX).

Luas services operate at 2 – 15 minute intervals in both directions.

Both the Sandyford Stop and the Stillorgan Stop on Blackthorn Avenue will serve the proposed development with both stops being 6 minutes' walk time from the subject site.

4.2 Operation

There are some 200 services per day in each direction between Sandyford and the City Centre. See Tables 2 and 3.

Table 2 Green Line Service Frequency – Sandyford to City Centre - Northbound

Time	Average No of Trams per Hour	Total Number of Trams
05:30-07:00	6	9
07:00-08:00	13	13
08.00-0900	20	20
09.00-10.00	12	12
10:00-16:00	10	60
16:00-19:00	12	36
19:00-00.25	8	41
	Total	192

Table 3 Green Line Service Frequency – City Centre to Sandyford – Southbound

Time	Average No of Trams per Hour	Total Number of Trams
06.00-07:00	5	5
07:00-10:00	15	45
10:00-16:00	10	60
16:00-19:00	15	45
19:00-01.00	7.5	45
	Total	200

4.3 Tram Capacity

The Green Line Capacity Enhancement Scheme was launched in 2017 and completed by TII in 2021 at a cost of €100m.

Earlier surveys by the NTA of passenger demand and conditions on the Luas Green Line prior to 2017 indicated that the line was operating at capacity during peak periods, with crowding experienced between the Balally and Ranelagh stops. This crowding resulted in passengers being unable or unwilling to board at these stops.

The Capacity Enhancement Scheme provided for the replacement of the original 44 metre long trams each with 55 metre long trams.

4.4 Line Capacity

Figures provided by Luas Operations in 2022 advise that while the extended 55 metre long trams have a nominal carrying capacity of 408 passengers per tram, the operational capacity used is 315 passengers per tram allowing for what Luas call a *'comfort factor'*.

Based on the frequency of 20 trams per hour and the tram capacity of 315 passengers per tram, the capacity of the Green Line between Sandyford and the City Centre is 6,300 passengers per hour in each direction during the AM Peak Hour 8 – 9.

4.5 Future Increase in Line Capacity

In March 2019, the National Transport Authority confirmed that notwithstanding the ongoing increase in passenger demand, the next increase in capacity on the Luas Green Line would not be required before 2040.

4.6 Access to Luas Stops

Walking distances to Luas stops in the area of the proposed development are set out in Table 4.

The nearest Luas stops are the Stillorgan Stop and the Sandyford Stop both located on Blackthorn Avenue less than 0.5km to the north of the proposed development. Both stops are within 6 minutes walking distance.

Other stops within 20 minutes walking distance are the Kilmacud Stop and the Central Park Stop.

Table 4 Walking Time to Luas Stops

Luas Stop	Services	Walk Time from Development
Kilmacud	Blackthorn Avenue	17 minutes
Stillorgan	Blackthorn Avenue	4 minutes
Sandyford	Blackthorn Avenue	6 minutes
Central Park	Leopardstown Road	16 minutes

5. Public Transport – Bus

5.1 Dublin Bus

Details of the bus services operated by Dublin Bus in the area of the proposed development are presented in Table 5 below.

Table 5 Dublin Bus Services

Bus Route	From	To	AM Peak Hour Frequency (08h00 – 09h00)	PM Peak Hour Frequency (17h00 – 18h00)
11	Ballymun	Sandyford Industrial Estate	3 in each direction	3 in each direction
47	City Centre	Belarmine	2 in each direction	2 in each direction
75	Dun Laoghaire	Tallaght	2 in each direction	3 in each direction

5.2 GoAhead Bus Services

Details of the bus services operated by GoAhead in the area of the proposed development are presented in Table 6 below.

Table 6 GoAhead Bus Services

Bus Route	From	To	AM Peak Hour Frequency (08h00 – 09h00)	PM Peak Hour Frequency (17h00 – 18h00)
114	Blackrock DART	Ticknock	1 in each direction	1 in each direction

5.3 Aircoach Services

Aircoach operate a 24-hour coach service between Clayton Hotel (formerly Bewleys Hotel) at Central Park and Dublin Airport.

Services on Route 700 to and from Central Park operate at the following frequencies:

From 00h00 - 04h00 : Every Hour

From 04h00 - 06h00 : Every 20 minutes

From 06h00 – 20h00 : Every 10 minutes

From 20h00 – 00h00 : Every 20 minutes

5.4 Future Bus Services

Objective TAM 4 of the Sandyford Urban Framework Plan sets out the expansion of bus services in the Sandyford area including: -

- *Fast and frequent shuttle bus service from the Blackrock DART station to the Stillorgan Luas and Sandyford Business Estate. This service shall open up public transport as an option to the vast hinterland of the DART line from Greystones to Malahide and Howth.*
- *An internal shuttle bus service. This service will provide a more sustainable travel opportunity and provide a campus feel to the area. It will also aid in the transporting of people from the Luas/Bus Interchange to their destination within the Sandyford Business District*

5.5 Bus Connects

Future bus services in the area of the proposed development are set out in Table 7 and illustrated in Figure 20.

The proposed timetable provides for a total of 10 buses in each direction during the AM Peak.

Table 7 Bus Connects Services

Route No	Route	Type	Frequency AM Peak
S8	Dun Laoghaire – City West	Orbital	15 minutes
86	Ticknock – City Centre	Other City Bound Route	30 minutes
L13	Kilternan – City Centre	Local Route	60 minutes
P13	Kilternan - UCD	Peak Time Route	30 minutes
P16	Ballyboden – UCD	Peak Time Route	60 minutes

Figure 20 Bus Connects - Extract from Dundrum Area Map

5.6 Access to Bus Stops

The nearest bus stops to the proposed development are located on Burton Hall Road, Blackthorn Road, and Blackthorn Avenue.

All of the stops are less than 6 minutes' walk from the proposed development. See Table 8.

Table 8 Walking Time to Bus Stops.

Location	Stop No	Services	Walk Time from Development
Blackthorn Drive (Carmanhall Road)	3181	11, 47, 75A, 114, 116	3 minutes
Blackthorn Drive (pick up)		Aircoach	4 minutes
Blackthorn Avenue (Blackthorn Drive)	451	11. 47, 116	3 minutes
Blackthorn Avenue (Luas Stop)		47, 114	6 minutes
Burton Hall Road (Arena Road)	448	47, 114, 700	3 minutes

6. County Development Plan 2016 - 2022

6.1 Road Objectives

Map 6 from the Dun Laoghaire Rathdown County Development Plan 2016 – 2022 shows the following 6-year Road Proposals in the area of the subject site: -

- E.S.B. Roundabout on Leopardstown Road to Arena Road and Blackthorn Road.

No Long-Term Road Proposals are shown on Map 6, an extract from which is presented in Figure 21.

Specific Local Objective 113 on the former Avid Technology site relates *to 'the provision of community infrastructure at ground floor along the eastern outer edge of the Carmanhall residential neighbourhood along Blackthorn Road.'*

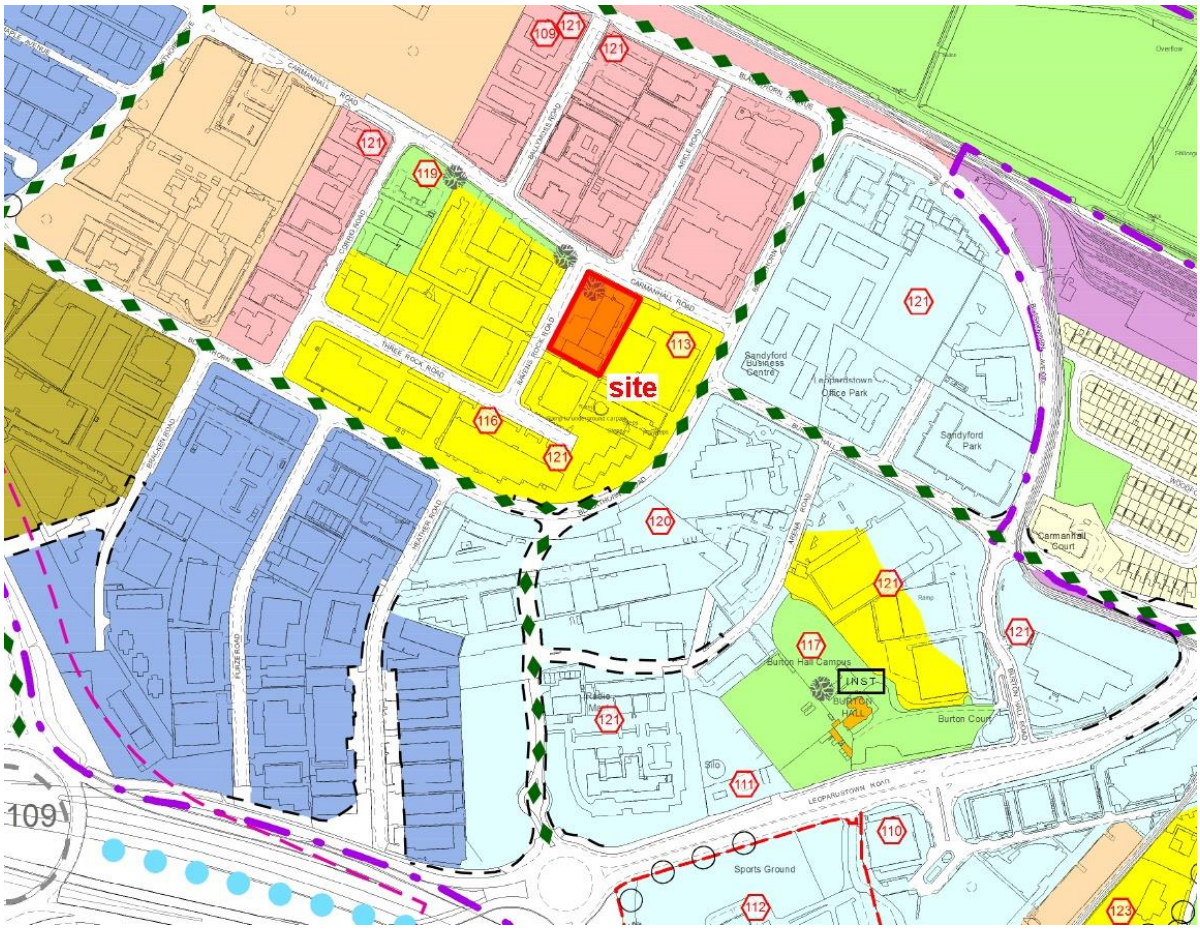

Figure 21 Map 6 DLR County Development Plan 2016-2022

6.2 Bus Priority

Map 6 illustrates the following Bus Priority Schemes serving the subject site: -

- The second phase of a Luas/Bus Interchange at the Stillorgan Luas stop on Blackthorn Avenue.
- Internal circular Quality Bus Corridor from a Luas / Bus Interchange at the Stillorgan Luas stop, proceeding in a clockwise direction via Blackthorn Avenue, Blackthorn Road and Blackthorn Drive.

  The above route will be modified to proceed via the Burton Hall Road Extension, Leopardstown Road, ESB Link Road, Corrig Road, left on Carmanhall Road and onto Blackthorn Drive.
- Tallaght to Sandyford (orbital route).

6.3 Bus Services

Objective TAM 4 of the Sandyford Urban Framework Plan sets out the expansion of bus services in the Sandyford area including

- *Fast and frequent shuttle bus service from the Blackrock DART station to the Stillorgan Luas and Sandyford Business Estate. This service shall open up public transport as an option to the vast hinterland of the DART line from Greystones to Malahide and Howth.*
- *An internal shuttle bus service. This service will provide a more sustainable travel opportunity and provide a campus feel to the area. It will also aid in the transporting of people from the Luas/Bus Interchange to their destination within the Sandyford Business District*

6.4 Cycling Objectives

Cycling policies and objectives are set out in Section 2.2.7 of the County Development Plan.

The objectives include an Orbital Cycle Route on Leopardstown Road.

No specific mention of the Sandyford Business District Pedestrian and Cycle Improvement Scheme was noted in the DLR County Development Plan 2016 – 2022.

6.5 Cycle Parking Standards

Standards for cycle parking are set out in Section 8.2.4.7 of the Dun Laoghaire Rathdown County Development Plan 2016 – 2022 and in the '*Standards for Cycle Parking and Associated Cycling Facilities for New Developments*', published by DLRCC in July 2017.

Long stay (resident) cycle parking for the proposed development is required to be provided at the rate of 1 space per unit.

Short stay (visitor) cycle parking for the proposed development is required to be provided at the rate of 1 space per 5 units.

6.6 Motorcycle Parking Standards

Section 8.2.4.8 of the Development Plan requires the provision of motorcycle parking at the rate of 4 spaces per 100 car parking spaces.

6.7 Electric Cars

Section 8.2.4.12 of the Development Plan requires the provision of charging for electric cars at the rate of 10 spaces per 100 car parking spaces.

6.8 Walking Objectives

Policies and objectives for walking are set out in Section 2.2.7 of the County Development Plan.

No specific objectives relevant to the proposed development were noted.

6.9 Sustainable Travel and Transportation

Policies and objectives for Sustainable Travel and Transportation are set out in Section 2.2 of the County Development Plan.

Policy ST20 requires *'the submission of Travel Plans for developments that generate significant trip demand. Plans should seek to reduce reliance on car-based travel and encourage more sustainable modes of transportation over the lifetime of the development.*

A Travel Plan for the subject development was prepared by Waterman Moylan in March 2022.

6.10 DLR County Development Plan 2022 – 2028

It is understood that the Draft DLR County Development Plan 2022- 2028 has been adopted by the members and will come into effect on 21st April 2022 after lodgement of the subject application.

7. Sandyford Urban Framework Plan 2016 - 2022

7.1 Background

The Sandyford Urban Framework Plan 2016 – 2022 is included in Appendix 15 of the County Development Plan 2016 – 2022.

Section 4.2 sets out the policies and objectives for *Sustainable Transport Infrastructure.*

7.2 Smarter Travel Objectives

Objective TAM1 in Section 4.2.1 of the Sandyford Urban Framework Plan advises as follows:

'It is an objective of the Council to require all future development in the Sandyford Business District to achieve a peak hour transport mode split of 45% trips by car drivers (maximum) and 55% by walking, cycling, public transport and other sustainable modes (minimum targets) as per Government policy stated in the document published by the Department of Transport entitled 'Smarter Travel, A Sustainable Transport Future 2009 – 2020'.

7.3 Cycling and Walking Objectives

The 6 Year Objectives for Cycling and Walking in TAM 6 of Section 4.2 of the SUFP are illustrated in Figure 22. They do not include any objectives, either Six-Year Objectives or Long-term Objectives for Cycling and Walking in the area of the proposed development.

Figure 22 SUFP Walking and Cycling Routes (SUFP Drawing No 6)

7.4 Road Objectives

Six-Year

The Six-Year Road Objectives for Sandyford are set out in Objective TAM 17and Drawing No 8 of the SUFP. These objectives which are illustrated in Figure 23 include:

- ESB Link Road and Link to Arena Road (No.6)

Long-Term

The long-term road objectives for Sandyford are set out in Objective TAM 18 and Drawing No 9 of the SUFP. See Figure 24.

They do not include any objectives for long term road objectives in the area of the proposed development.

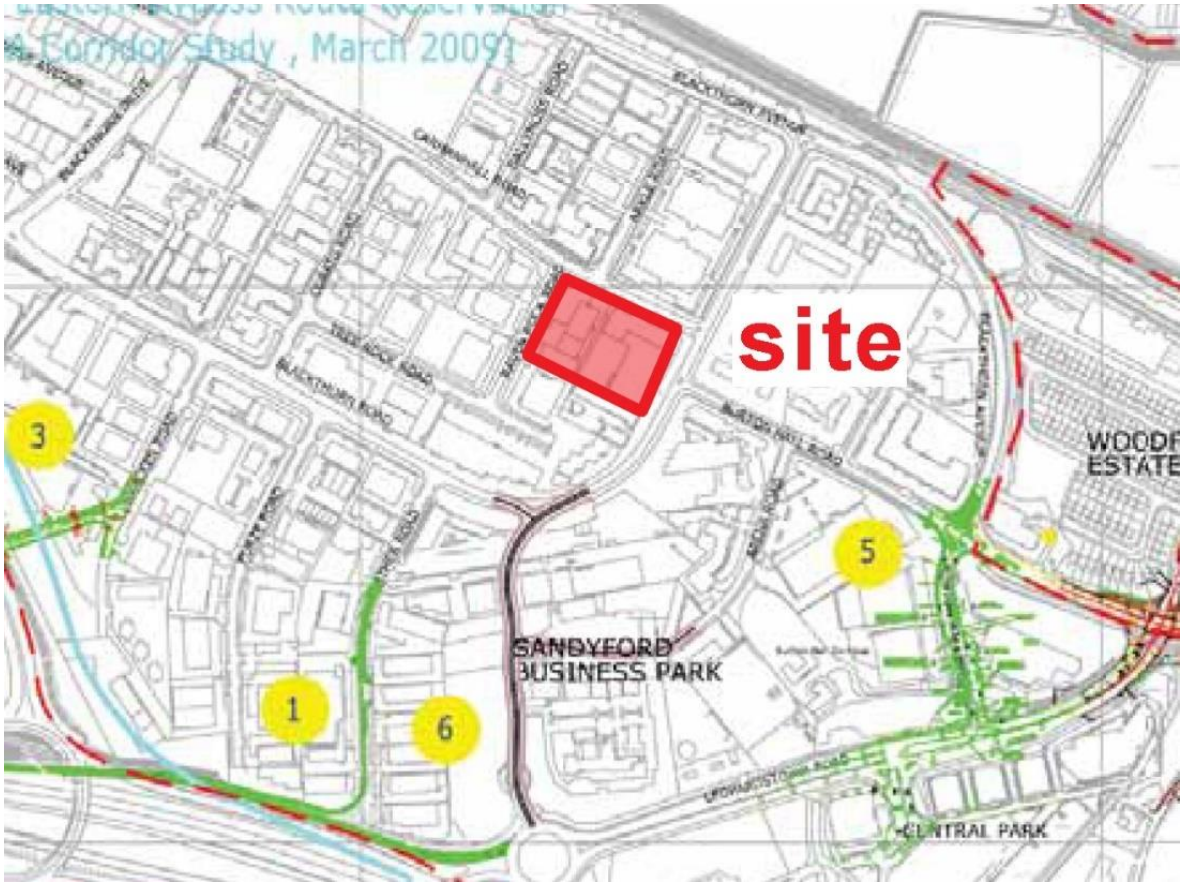

Figure 23 SUFP Six Year Road Objectives (SUFP Drawing No. 8)

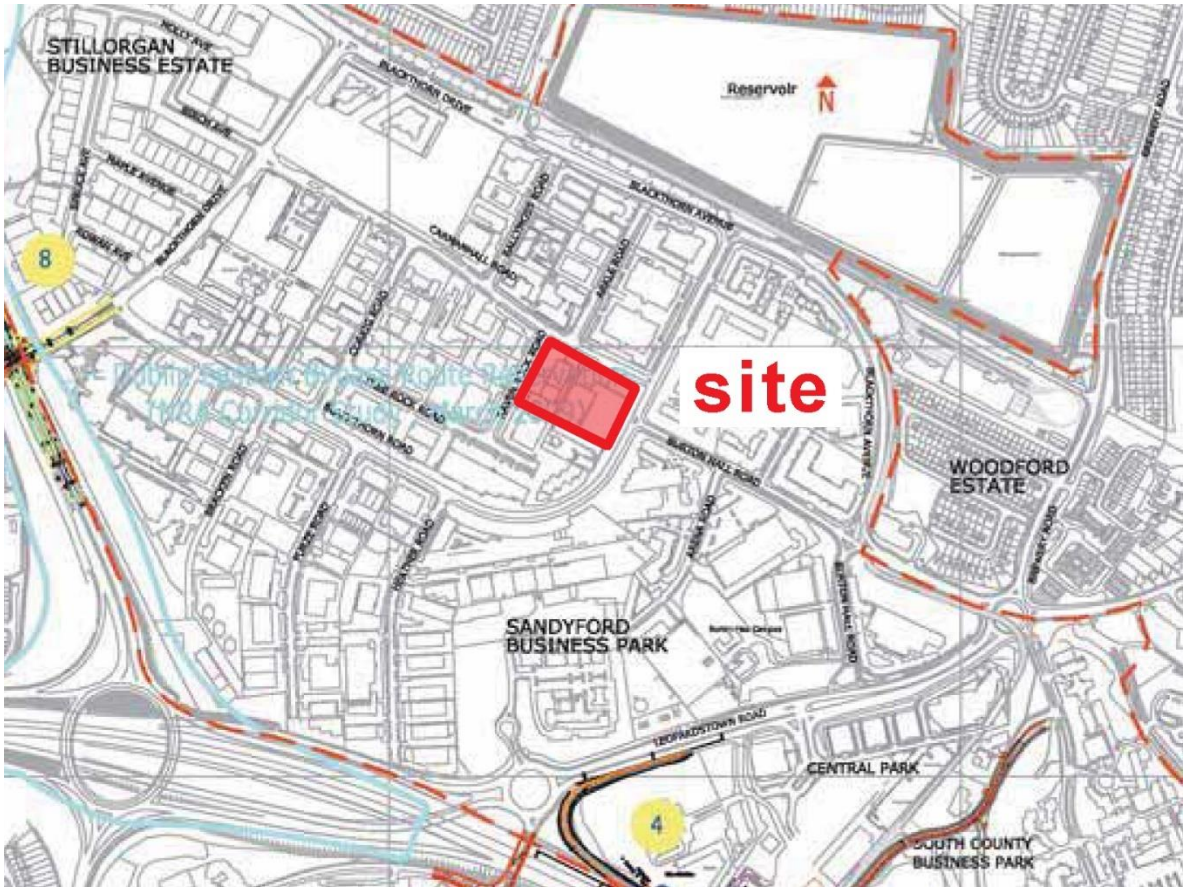

Figure 24 SUFP Long Term Road Objectives (SUFP Drawing No. 9)

8. Road and Cycle Schemes

8.1 ESB Link Roads

8.1.1 Background

A Part 8 planning application for the 0.35 km long ESB Link Road between Junction 14 at the M50 and Blackthorn Road was registered by Dun Laoghaire Rathdown County Council on 20th November 2013. See Figure 25.

The application included a Part 8 Planning Environmental Report prepared by Aecom Roughan O'Donovan in October 2013.

There has been no decision on the application at the time of writing in March 2022. It is understood nonetheless that the Scheme is progressing towards the tender stage for completion in 2023.

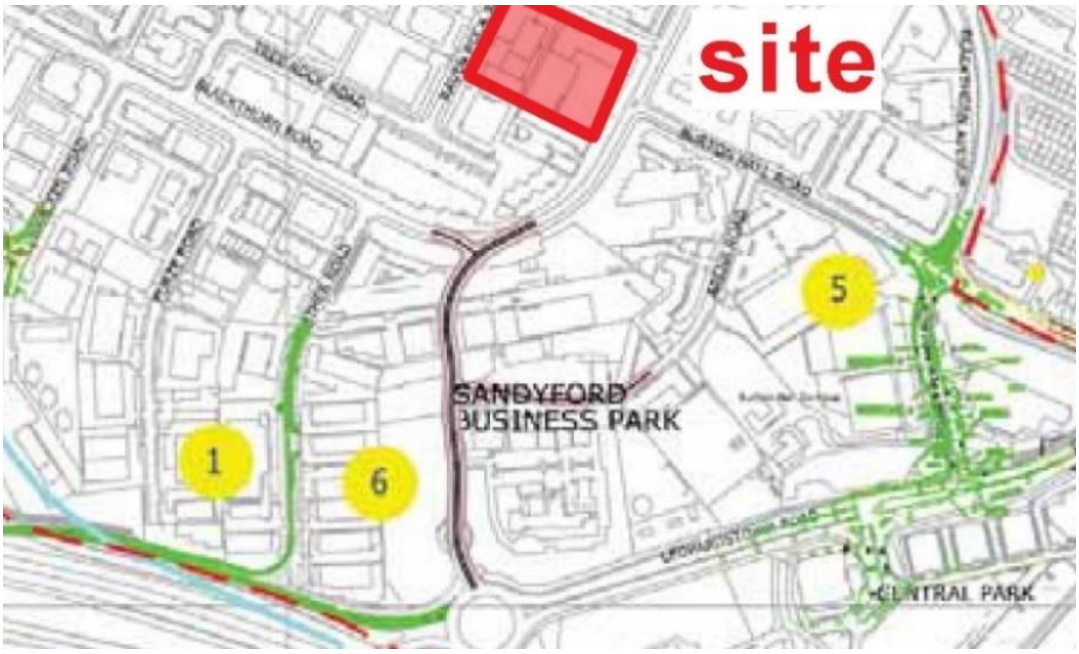

Figure 25 ESB Link Road

8.1.2 Traffic Impact

The primary traffic impact of the Scheme will be to divert traffic between Junction 14 on the M50 and Sandyford Business District from its present long route via Leopardstown Road and Burton Hall Road to the shorter ESB Link Road.

In terms of the roads surrounding the proposed development, the major impact will be at the Blackthorn Road / Burton Hall Road junction where a significant volume of traffic will be diverted from Burton Hall Road to Blackthorn Road.

8.1.3 Junction ESB Link Road and Blackthorn Road

The 2019 Forecast Junction Flows reproduce from Figure 5.2 of the Planning Environmental Report are presented in Figure 26.

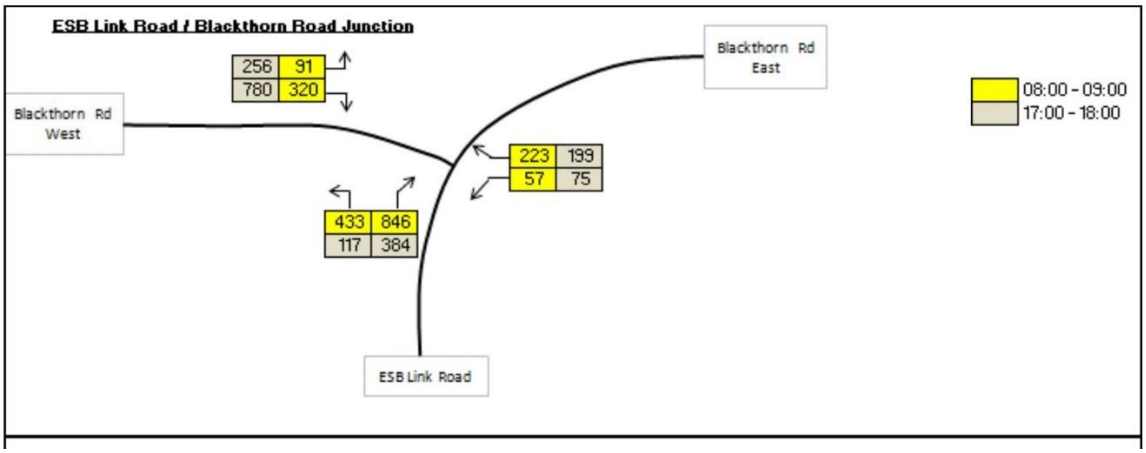

Figure 26 Junction Flows ESB Link Road and Blackthorn Road

8.2 Sandyford Business District Pedestrian and Cycle Improvement Scheme

8.2.1 Background

Dun Laoghaire Rathdown County Council, in conjunction with the National Transport Authority, is in the process of carrying out walking and cycling improvements in the Sandyford Business District on Burton Hall Road, Blackthorn Road and Carmanhall Road. See Figures 27 and 28.

The Council's Traffic & Road Safety Section undertook a Non-Statutory Public Consultation for the Sandyford Business District Pedestrian and Cycle Scheme during August and September 2021 after which a post consultation report was prepared for the Dundrum Area Committee.

The consultation process included a Preliminary Design Report and drawings prepared by Barry Transportation in August 2021.

The writer is not aware of any decision on the application at the time of writing in March 2022. It is understood nonetheless that the Scheme is progressing towards the tender stage for completion in 2023.

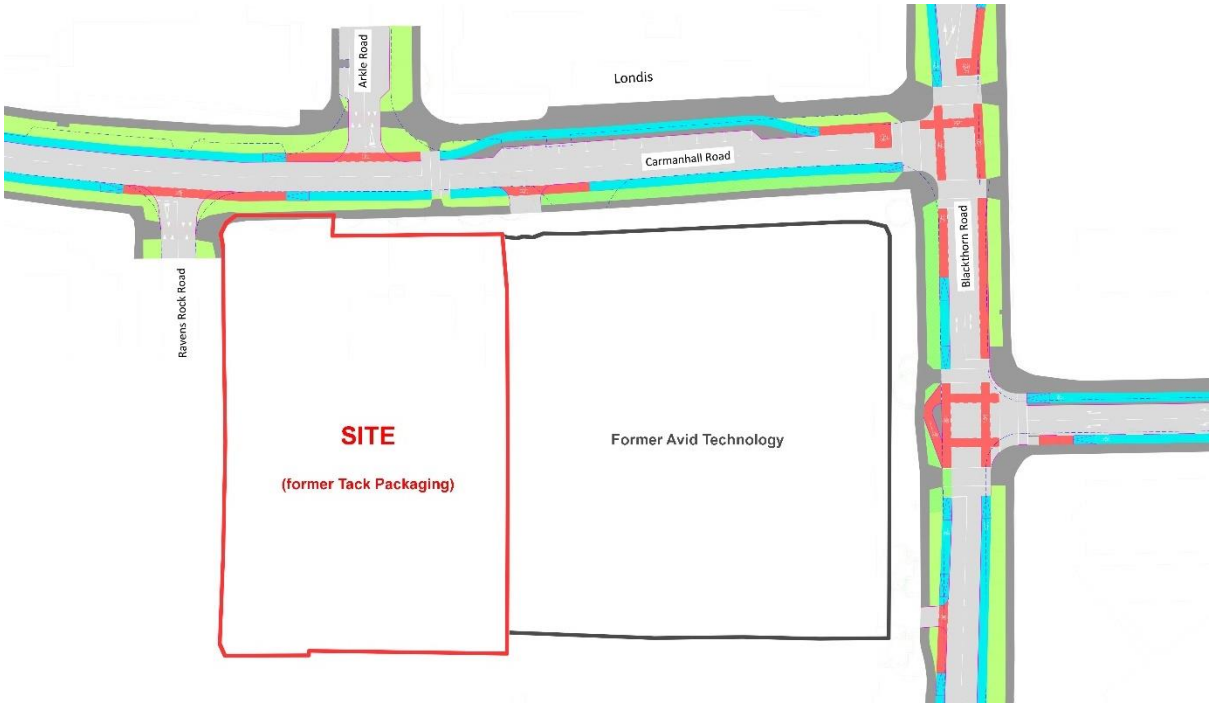

Figure 27 Sandyford Business District Pedestrian and Cycle Improvement Scheme

8.2.2 Description of Scheme

The Scheme comprises

- The provision of raised and adjacent cycle tracks on both sides of Burton Hall Road, Blackthorn Road and Carmanhall Road in accordance with the NCM.
- The provision of a traffic signalised junction at Carmanhall Road and Blackthorn Road junction.
- Crossings at some junctions are to be upgraded to toucan crossings to allow bicycles to use the signalised crossings where appropriate.
- Tightened corner radii at junctions and side roads.
- Left turn slips and pedestrian refuge islands removed in accordance with DMURS.
- Widened footpaths and increased pedestrian space.
- Increased area available for landscaping and retention of as many existing trees as possible. Areas have been identified for potential new tree planting to compensate for any losses.
- The existing on-street car parking spaces will be maintained where possible, with some car parking to be removed on Carmanhall Road.

Public consultation closed on 17th September 2021.

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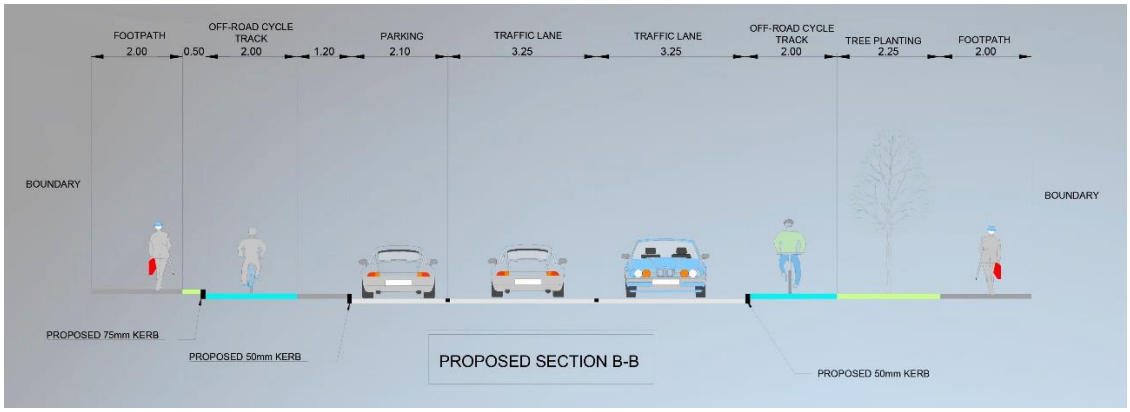


Figure 28 Crossection Sandyford Business District Pedestrian and Cycle Improvement Scheme.

8.2.3 Impact on Subject Site

The pedestrian and cycle access to the proposed development have been integrated with the proposals for the Sandyford Business District Pedestrian and Cycle Improvement Scheme. 2021 in terms of

- Footpaths and pedestrian facilities
- Cycle tracks and access to cycle parking (1.75 m wide)
- Landscape
- Carmanhall Road / Blackthorn Road junction.

The pedestrian and cycle layout on the Carmanhall Road frontage of the site are shown in Figures 27 and 28.

9. Traffic Surveys

9.1 Traffic Survey 2020

As part of the planning application for a residential development on the former Avid Technology site (Ref ABP 310104 21), a traffic survey covering nine junctions in the surrounding area was carried out by Irish Traffic Surveys (ITS) on Tuesday 25th February 2020 over a 12-hour period between 07h00 and 19h00. The survey was carried out in the month before the first Covid lockdown which started in March 2020. The results for the AM Peak Hour are presented in Figure 29.

From the results of the 2020 survey, it would appear that the Average Annual Daily Traffic (AADT) on Blackthorn Road is some 15,800 vehicles per day. The two-way traffic flow on Blackthorn Road is some 1,230 vehicles per hour (vph) during the AM peak hour reducing to 450 vph during the PM peak hour.

Similarly, the Average Annual Daily Traffic (AADT) on Carmanhall Road is some 8,800 vehicles per day The two-way traffic flow on Carmanhall Road is some 600 vehicles per hour (vph) during the AM peak hour increasing marginally to 650 vph during the PM peak hour.

No flows were recorded on Ravens Rock Road.

The full results of the traffic survey carried out in February 2020 are included in Appendix A.

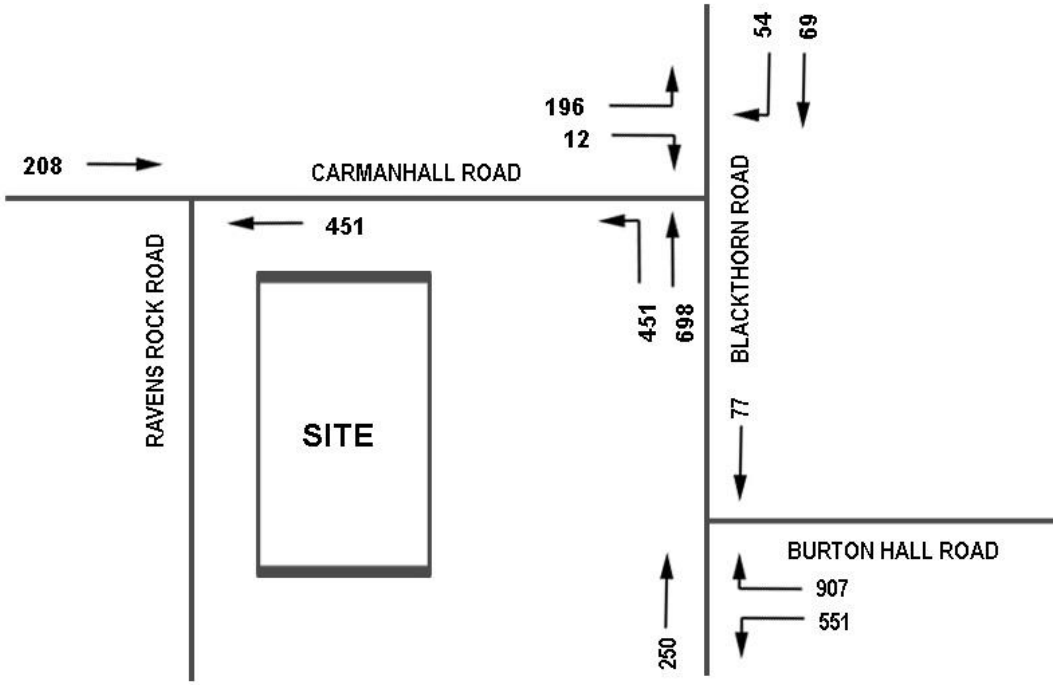


Figure 29 Surveyed Junction Movements February 2020

9.2 Impact of Covid Restrictions 2020 - 2022

At the time of writing in March 2022, there has not been a return to work for most of the businesses in the Sandyford area. As a result, traffic volumes have not recovered to pre-Covid levels and any traffic surveys in early 2022 prior to the lifting of Covid restrictions were unlikely to provide results at or near pre-Covid levels.

However, a supplementary traffic survey was carried out on a weekday over a 12-hour period between 07h00 and 19h00 in January 2022 at the junction of Carmanhall Road and Ravens Rock Road as this junction had not been included in the 2020 survey. The 2022 survey also included the junction of Carmanhall Road and Blackthorn Road for control purposes.

9.3 Traffic Survey 2022

A 12-hour traffic survey of the two junctions on Carmanhall Road was carried out in January 2022. The results of the survey for the AM Peak Hour are presented in Figure 30.

When compared with the 2020 survey, the total approach flow to the Carmanhall Road / Blackthorn Road junction was only some 65% of the 2020 surveyed flow indicating the major reduction resulting from the Covid travel and working restrictions.

The full results of the traffic survey carried out in January 2022 are included in Appendix B.

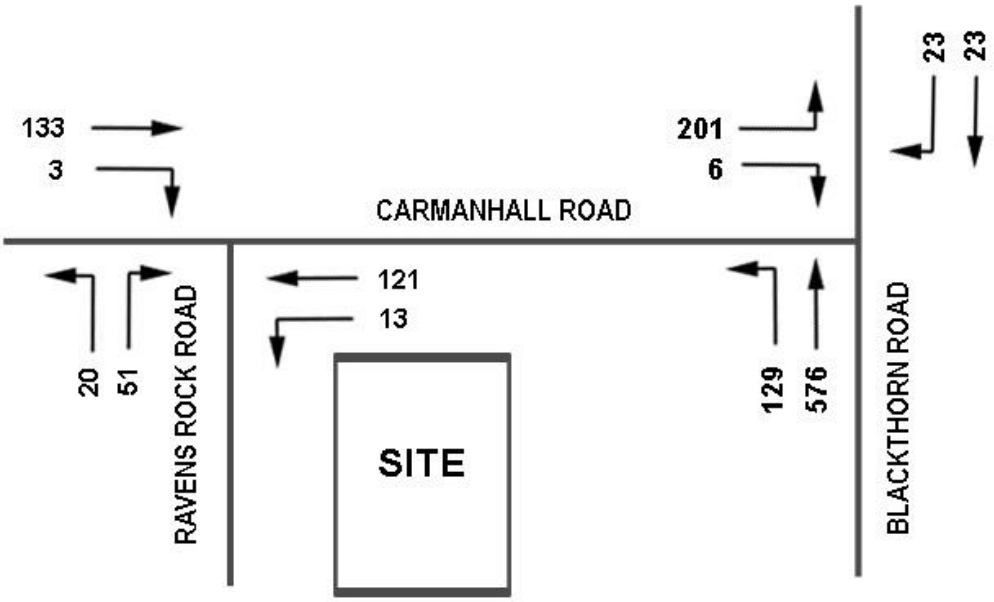


Figure 30 Surveyed Junction Movements January 2022

9.4 Base Flows 2022

The base flows for the two junctions on Carmanhall Road have been calculated on the basis that

- There was no growth in traffic between February 2020 and January 2022 due to working restrictions imposed to limit the spread of Covid-19.
- The traffic movements surveyed in February 2020 for the Blackthorn Drive / Carmanhall Road junction were unchanged in January 2022.
- The traffic movements on Ravens Rock Road surveyed in January 2022 should be increased by a factor of 50% to reflect pre-Covid levels.

The Base Flows for the three junctions in 2022 are presented in Figure 31.

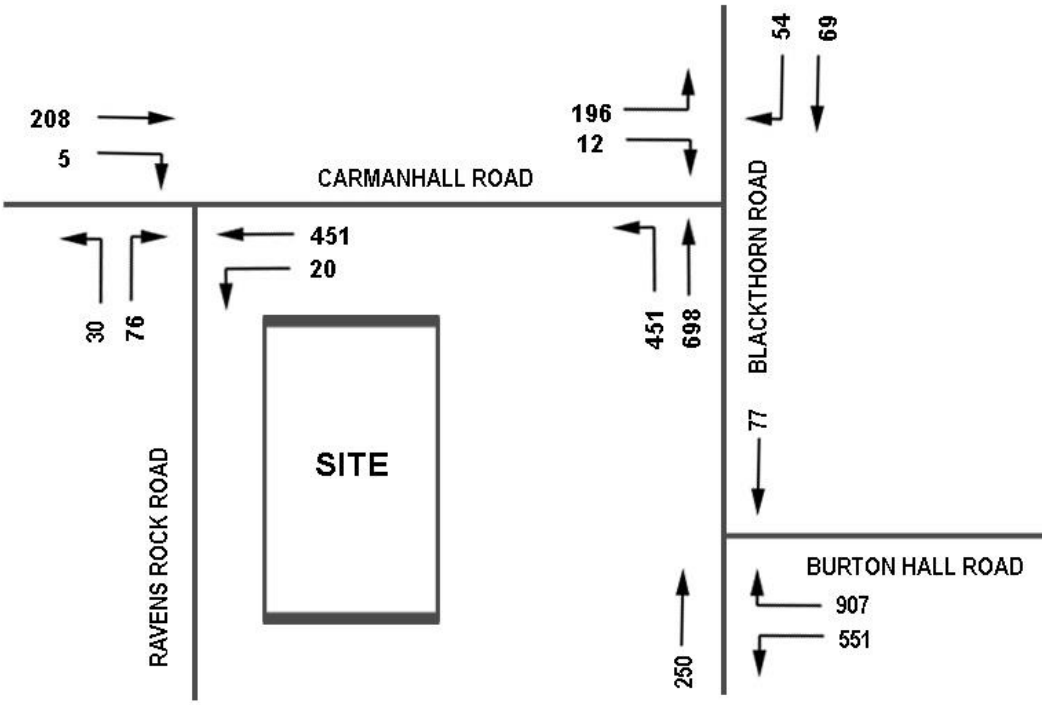


Figure 31 Base Flows 2022.

9.5 Growth Factors

To account for future traffic growth after 2022, Annual Growth Factors based on the Project Appraisal Guidelines: Unit 5.5 Traffic Growth Forecasting, TII, 2011, have been applied to the 2022 Base Flows to calculate the projected flows for 2026 (Opening Year), 2031 (Opening Year + 5) and 2041 (Opening Year + 15).

The annual growth rates used for each of the periods 2022– 2026, 2022 - 2031 and 2027 – 2041 were the LV Central Growth rates from Table 5.3.2 for the Dublin of 1.0134 per annum for the period 2013 – 2030 and 1.0038 or the period 2030- 2050.

The overall growth factors for the Opening Year 2026, Design Year 2031, and Future Year 2041 are set out in Table 9.

Table 9 Overall Traffic Growth Factors

Period	Overall Growth Factor
2022 - 2026	1.054
2022 - 2031	1.116
2022 - 2041	1.159

9.6 Base Flows Opening Year 2026

The junction movements for the Opening Year 2026 were obtained by increasing the Base Flows for 2022 by the factor of 1.054 from Table 7. The Base Flows for the Opening Year 2026 are presented in Figure 32.

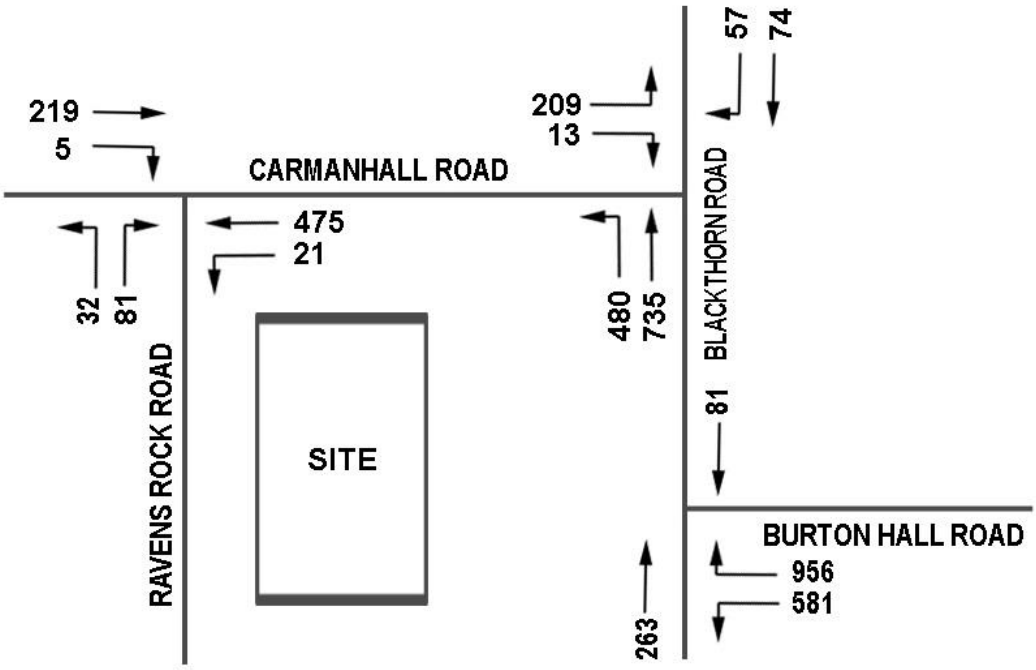


Figure 32 Base Flows - Opening Year 2026

9.7 Base Flows for Design Year 2031 (Opening Year + 5)

The junction movements for the Design Year 2031 were obtained by increasing the Base Flows for 2022 by the factor of 1.116 from Table 7. The Base Flows for the Design Year 2031 are presented in Figure 33.

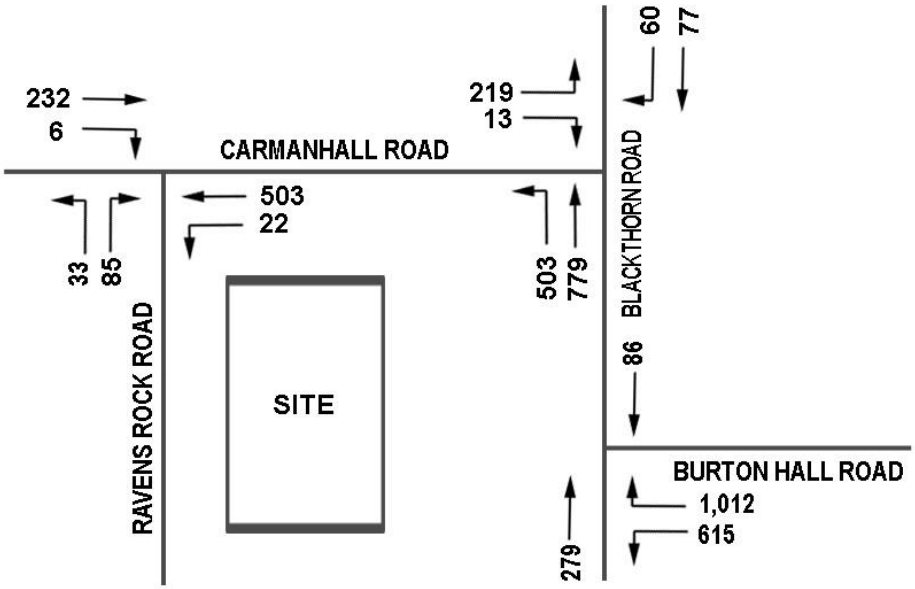


Figure 33 Base Flows - Design Year 2031

9.8 Base Flows for Future Year 2041 (Opening Year + 15)

The junction movements for the Future Year 2041 were obtained by increasing the Base Flows for 2022 by the factor of 1.159 from Table 11.

The Base Flows for the Future Year 2041 are presented in Figure 34.

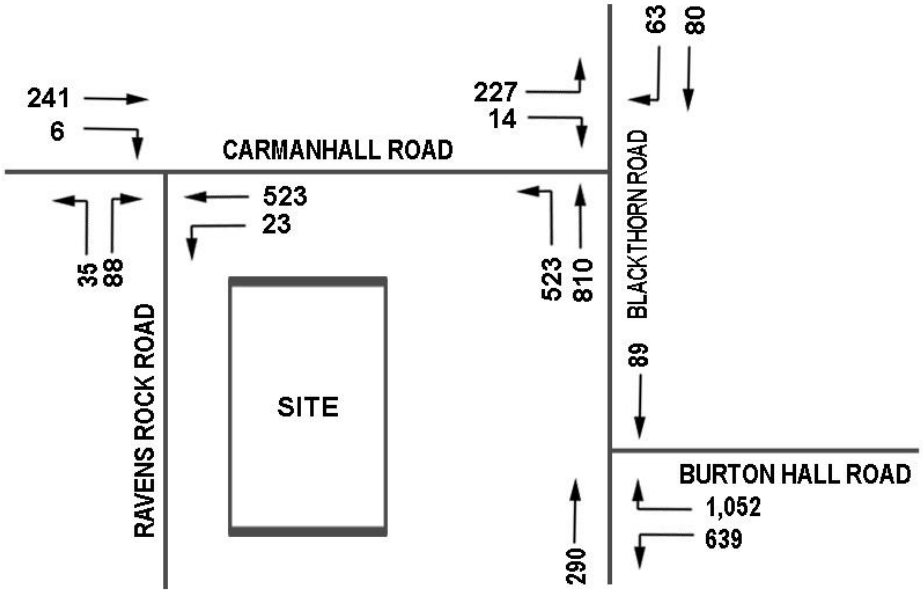


Figure 34 Base Flows - Future Year 2041

9.9 ESB Link Road

As described in Section 8.2 of this T & TA, the major impact of this Scheme will be at the Blackthorn Road / Burton Hall Road junction where a significant volume of traffic will be diverted from Burton Hall Road to Blackthorn Road.

The traffic impact during the AM Peak Hour 08.00 – 09.00 is expected to be: -

(a) A diversion of 699 vehicles per hour from the right turn on Burton Hall Road to the ESB Link Road and then northbound on Blackthorn Road (east). The rate of diversion will increase to 780 vehicles in 2031 and 810 vehicles in 2041.

(b) A diversion of 338 vehicles per hour from the left turn on Burton Hall Road to the ESB Link Road and then on to local destinations. The rate of diversion will increase to 377 vehicles in 2031 and 392 vehicles in 2041.

On the basis of a projected completion in 2023, the ESB Link Road will have no impact on the Base Flow for 2022 but will have an impact on the Base Flows for 2026, 2031 and 2041.

The Base Flows including the ESB Link Road for the Opening Year 2026, Design Year 2031 and Future Year 2041 are presented in Figures 35, 36 and 37.

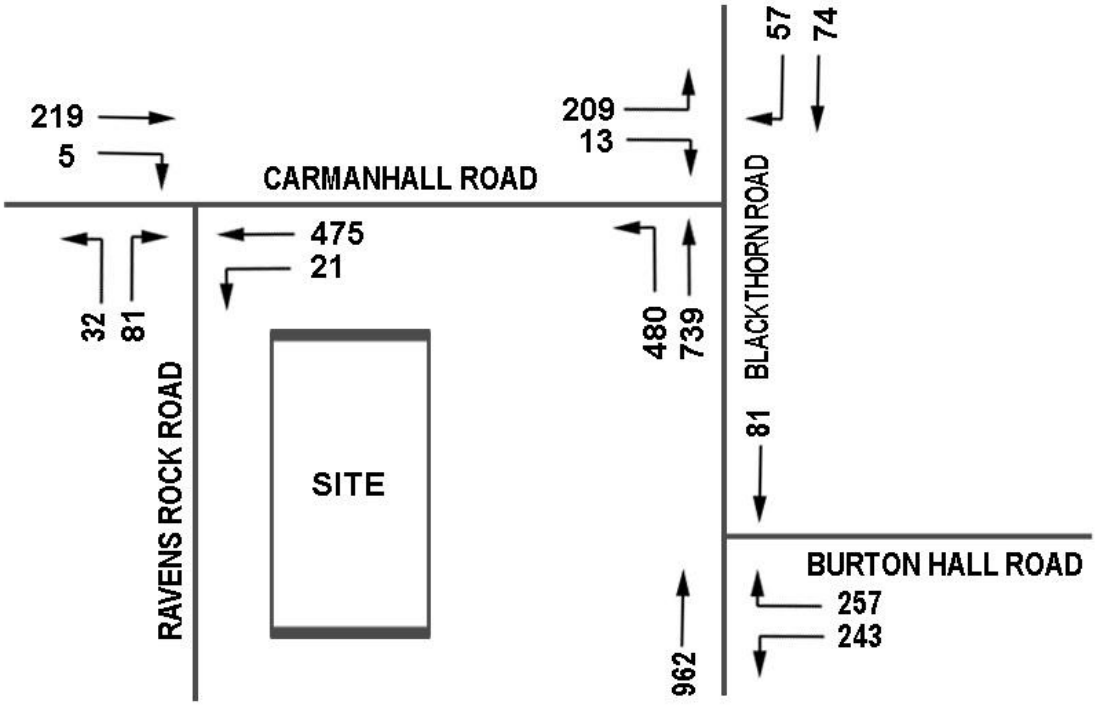


Figure 35 Base Flow Opening Year 2026 including ESB Link Road

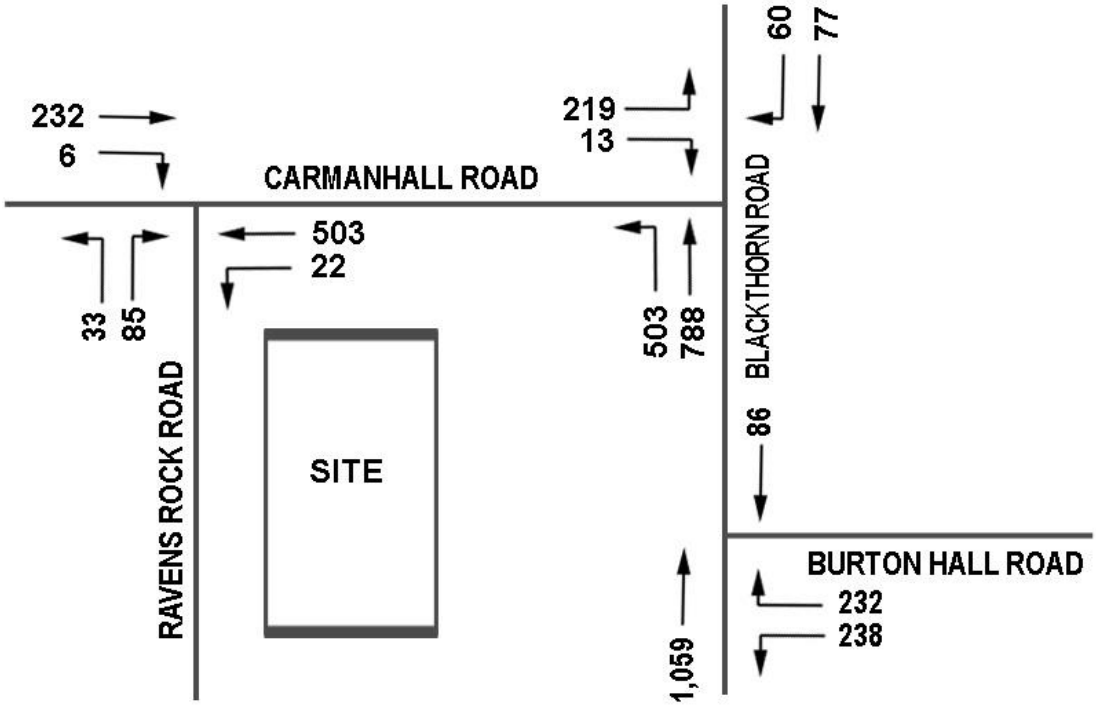


Figure 36 Base Flow for Design Year 2031 including ESB Link Road

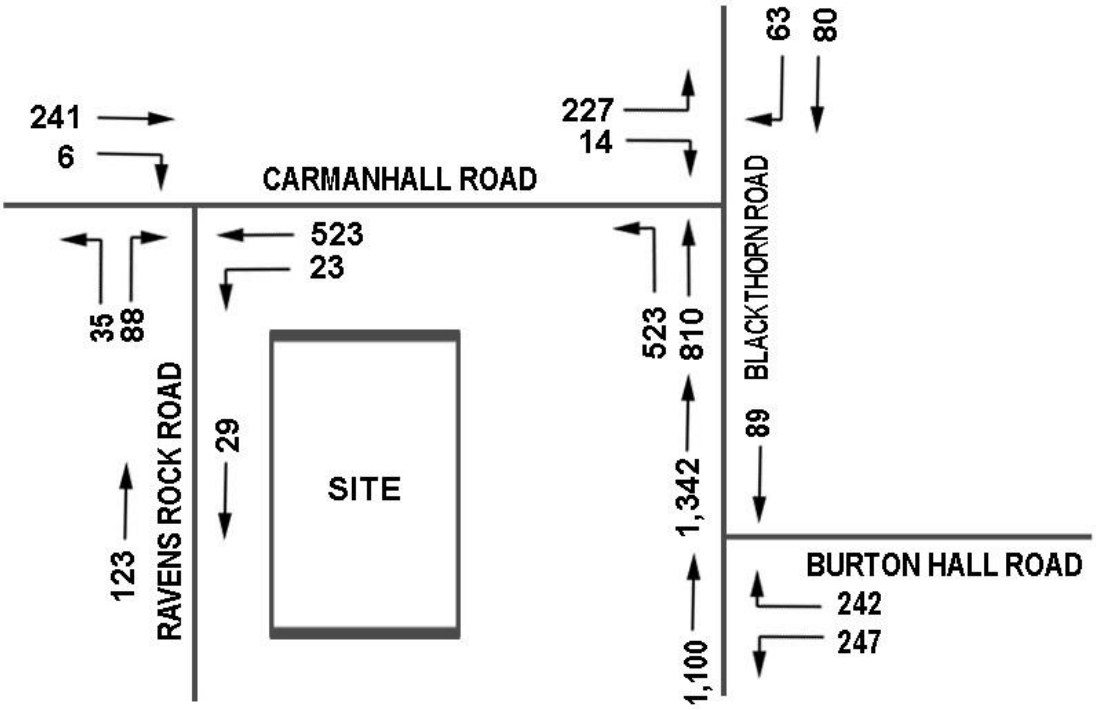


Figure 37 Base Flow Future Year 2041 including ESB Link Road

10. Car Parking

10.1 County Development Plan 2016-2022

Table 8.2.3 of the DLR County Development Plan 2016-2022 prescribes the '*standard*' car parking provision for apartments as follows

- 1 space per 1-bed unit
- 1.5 spaces per 2-bed unit
- 2 spaces per 3-bed unit

Section 8.2.4.5 notes that '*Reduced car parking standards (residential and non-residential) may be acceptable dependant on*

- *The location of the proposed development and specifically its proximity to Town Centre and District Centres and high density commercial / business areas.*
- *The proximity of the proposed development to public transport.*
- *The precise nature and characteristics of the proposed development.*
- *Appropriate mix of land uses within and surrounding the proposed development.*
- *The availability of on-street parking controls in the immediate area.*
- *The implementation of a Travel Plan for the proposed development where a significant modal shift towards sustainable transport modes can be achieved.*
- *Other agreed circumstances where it can be justified on sustainability grounds.*

10.2 Car Parking Calculation

If the standards set out in the Development Plan were to be applied to the proposed development, the car parking requirement would be 236 spaces as calculated in Table 10 equivalent to 1.14 spaces per unit for the 207 units proposed.

Table 10 Car Parking Requirement DLR County Development Plan 2016 – 2022

Type	No	Standard	Spaces
Studio	48	1 space per unit	48
1-bed	103	1 space per unit	103
2-bed	55	1.5 space per unit	83
3-bed	1	2.0 space per unit	2
Total	207	1.14 spaces per unit	236

10.3 Design Standards for New Apartments, 2018

A revised version of the document "*Sustainable Urban Housing: Design Standards for New Apartments"* was published by the Department of Housing Planning and Local Government in December 2020.

The parking standards set out in this document see to achieve a considerably lower parking ratio for new residential apartments than those prescribed in the Dun Laoghaire-Rathdown County Development Plan 2016-2022.

The guidelines for parking are summarised in the following extracts from that document:

Car Parking

4.18 The quantum of car parking or the requirement for any such provision for apartment developments will vary, having regard to the types of location in cities and towns that may be suitable for apartment development, broadly based on proximity and accessibility criteria.

1) Central and/or Accessible Urban Locations

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

4.20 These locations are most likely to be in cities, especially in or adjacent to (i.e. within 15 minutes walking distance of) city centres or centrally located employment locations. This includes 10 minutes walking distance of DART, commuter rail or Luas stops or within 5 minutes walking distance of high frequency (min 10 minute peak hour frequency) bus services.

2) Intermediate Urban Locations

4.21 In suburban/urban locations served by public transport or close to town centres or employment areas and particularly for housing schemes with more than 45 dwellings per hectare net (18 per acre), planning authorities must consider a reduced overall car parking standard and apply an appropriate maximum car parking standard. 3) Peripheral and/or Less Accessible Urban Locations

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

3) Peripheral and/or Less Accessible Urban Locations

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

4.23 For all types of location, where it is sought to eliminate or reduce car parking provision, it is necessary to ensure, where possible, the provision of an appropriate number of drop off, 25 service, visitor parking spaces and parking for the mobility impaired. Provision is also to be

made for alternative mobility solutions including facilities for car sharing club vehicles and cycle parking and secure storage. It is also a requirement to demonstrate specific measures that enable car parking provision to be reduced or avoided.

4.24 As well as showing that a site is sufficiently well located in relation to employment, amenities and services, it is important that access to a car sharing club or other non-car based modes of transport are available and/or can be provided to meet the needs of residents, whether as part of the proposed development, or otherwise. 'Car free' development is permissible and if developed, must be fully communicated as part of subsequent apartment sales and marketing processes.

4.25 Where any underground car parking is proposed, such facilities must be well lit and adequately ventilated. Where surface parking is provided, it should be clearly accessible to the entrance to, and where appropriate, overlooked by, the units it serves. Car parking may be provided on-street at the edge(s) of a development site in some locations.

4.26 Decked or multi-storey car parking may also be considered but should not be compromise the quality of amenity space, building design or streetscape. At least one principal façade of multi-storey car parks should be fronted by development, for example a south-facing elevation and such structures may also provide an opportunity for rooftop amenity space. In all cases, designated parking spaces for disabled drivers should be provided.

4.27 For building refurbishment schemes on sites of any size or urban infill schemes on sites of up to 0.25ha, car parking provision may be relaxed in part or whole, on a case-by-case basis, subject to overall design quality and location.

The recommendation in the Design Standards that car parking '*be minimised, substantially reduced or wholly eliminated in certain circumstances'* can be applied to the subject site which is located in an *Intermediate Urban Location* within 10 minutes walking distance of Luas.

10.4 Chief Executive's Report on Draft Plan Consultation, 2021

At the time of writing in January 2022, Dun Laoghaire Rathdown County Council were at an advanced stage in the process of reviewing and preparing a new County Development Plan for the period 2022 – 2028. The process of reviewing the 2016-2022 County Development Plan and preparation of the new Plan formally commenced in January 2020.

A Draft Plan was placed on public display for a period of over 13 weeks between January and April 2021. The DLR Chief Executive's Report on the Draft Plan Consultation 2021 noted in Section 4.4.3 *Car Parking*

'The reason for limiting the supply of car parking spaces (i.e. applying maximum car parking standards) is to limit car-borne commuting and thereby limit its unsustainable carbon and congestion impacts. In the current Plan, all non-residential uses have maximum car parking standards. Residential use on the other hand have parking norms. The Section 28 Apartment Guidelines recommend an approach of reducing car parking provision to standards which are lower than the existing County Development Plan, while at the same time seeking car clubs and increased cycle parking in quantitative and qualitative terms. This is a complex area. The Council are working with the NTA and other Dublin authorities to advance this issue'.

The report recommends that these issues be considered further in the preparation of the Draft Plan.

10.5 DLR Adopted County Development Plan 2022-2028

It is understood that the Draft DLR County Development Plan 2022- 2028 has been adopted by the members will come into effect on 21st April 2022 after lodgement of the subject application.

Car parking zones and standards were set out in Table 12.6 of the Draft County Development Plan 2022-2028. The subject site is located in Parking Zone 2 within 10-minute walk of not just one but two Luas Stops.

In the draft, Section 12.4.5.6 advised that

For the purposes of the parking standards set out in Table 12.6 below, Built to Rent developments are considered to be residential apartments. Where a Built to Rent scheme avails of lower car parking based on the nature of the use, a condition should be attached to any grant of permission to state that planning permission shall be sought for a change of tenure to another tenure model following the period specified in the covenant. A lower car parking standard may be acceptable for Shared Living having regard to the assessment criteria for parking provision and location in terms of parking zones as set out above.

10.6 County Development Plan 2022 – 2028

It is understood that the Adopted DLR County Development Plan 12022- 2028 will come into effect on 21st April 2022 after lodgement of the subject application.

10.7 The SHD Experience

In a number of recent decisions, An Bord Pleanala has approved a much-reduced provision of car parking when compared with the maximum standards set out in the various Development Plans.

A summary of the parking provision in similar residential developments approved under the SHD provision is set out in Table 11.

The contents of Table 12 are in broad agreement with the experience of existing BTR schemes where the demand for car parking is approximately 0.3 spaces per unit.

Table 11 Car Parking Ratios – Strategic Housing Development Residential Projects

Ref No	Scheme	Units	Parking	Ratio
300520	Blakes Stillorgan	282 units	143 spaces	0.50
301909	Belgard Gardens, Tallaght	428 units	129 spaces	0.30
303435	Dulux Factory, Davitt Road	265 units	109 spaces	0.41
305176	Stillorgan Leisureplex	232 units	95 spaces	0.41
305345	The Grange, Brewery Road	287 units	100 spaces	0.35
305725	Fourth Avenue, Cookstown	245 units	79 spaces	0.32
306167	Rathoath Road, Pelletstown	435 units	196 spaces	0.45
306506	Gort Muire, Dundrum	730 units	296 spaces	0.40
306705	Gallaher Factory, Greenhills Road	502 units	202 spaces	0.40
306987	Swiss Cottage, Swords Road, Santry	112 units (BTR)	36 spaces	0.30
307011	Omni Park, Swords Road, Santry	324 units	152 spaces	0.47
307092	Palmerstown Retail Park, Palmerstown	250 units (BTR)	125 spaces	0.50

10.8 Former Avid Technology Site

10.8.1 DLRCC 2021 (SHD 310104)

The SHD planning application lodged by Atlas GP Ltd.in April 2021 comprised a build-to-rent residential development with 428 no. Apartments, childcare facility, resident's amenities, and associated siteworks on the Former Avid Technology Site, Carmanhall Road, Sandyford Industrial Estate, Dublin 18 (Reg Ref: SHD 310104).

The application incorporated a single vehicular access from Carmanhall Road with 145 on-site car parking spaces equivalent to 0.34 spaces per unit.

The report on the application submitted by DLR to ABP in June 2021 set out the planning authority's recommendations as to whether the application should be granted or refused. This report also incorporated an internal report from DLR Transportation Planning dated 10th June 2021.

One of the primary transportation conclusions of both reports related to car parking:

"*Transportation Planning recommends the provision of 1 car parking space per apartment unit. This would equate to 428 spaces for this development. A typical alternative to this requirement would be to provide compensatory club-car parking".*

10.8.2 An Bord Pleanala 2021 (SHD 310104)

The SHD planning application lodged by Atlas GP Ltd.in April 2021 on the former Avid Technology site at Carmanhall Road comprised a build-to-rent residential development with 428 no. Apartments, childcare facility, resident's amenities, and associated siteworks on the Former Avid Technology International Site, Carmanhall Road, Sandyford Industrial Estate, Dublin 18.

The application incorporated a single vehicular access from Carmanhall Road with 145 on-site car parking spaces.

The Inspector's report dated 29th July 2021 assessed the car parking elements of the proposed development as follows:

10.8.7. While the concerns of the Planning Authority are acknowledged, I consider the subject site to be suitable for the accommodation of reduced car-parking standards in accordance with the outlined national policies, while also having regard to Objective TAM1 of the SUFP, which is to require all future development in the Sandyford Business District to achieve a peak hour transport mode split of 45% trips by car drivers (maximum) and 55% trips by walking, cycling and public transport and other sustainable modes (minimum targets). The implementation of a Mobility Management Plan will encourage alternative transport modes and the development will be centrally managed via a management company that will make prospective occupiers clearly aware of the parking management strategy. Furthermore, the development will incorporate dedicated car club spaces which have the potential to replace a significant number of private car journeys. In this context, the reduction in provision can be justified and I consider that proposals are generally acceptable

10.9 Car Parking Proposed – Current Application

Having regard to the location of the subject site within a 10-minute walk of Luas in a high density commercial / business area with on-street parking controls, a car parking provision of 0.35 space per apartment (79 spaces for 207 apartments) is proposed

DRCC have indicated in Section 2.2.9 of the Planning Report dated January 2022 (Reg Ref PAC/SHD/276/21) for the contiguous Avid site that the Planning Authority could accept some reduction in Development Plan standards due to proximity to public transport infrastructure but that the proposed number of car parking spaces is an insufficient provision.

The Council concerns could be mitigated in part by the provision of compensatory club parking where one GoCar space is deemed to be the equivalent of 20 standard car parking spaces (Ref: GoCar website).

10.10 Details of Car Parking

The 79 spaces to be provided within the proposed development at Lower Ground and Basement Levels will be allocated as shown in Table 12.

Table 12 Allocation of Car Parking

Use	Standard	Spaces
General Residential		65 spaces
Electric Charging	10% of total	8 spaces
Disabled	4% of total	4 spaces
Car Club (GoCar)	None	2 spaces
Visitor	None	0 spaces
Total	0.35 spaces per unit	79 spaces

10.11 Compliance with DLRR Development Plan 2016-2022

The compliance of the proposed development with Section 8.2.4.5 *Car Parking Standards* of the DLR County Development Plan 2016 – 2022 is demonstrated in Table 13 below.

This section of the current Development Plan provides for reduced car parking standards for any development (residential and non-residential) on the basis of compliance with the criteria in Table 11.

Table 13 Parking Compliance with Section 8.2.4.5 of DLR Development Plan 2016 - 2022

Criterion	Compliance
The location of the proposed development and specifically its proximity to Town Centres and District Centres and high density commercial/ business areas.	The Sandyford Business District in which the development is to be located is described in the Sandyford Urban Framework Plan primarily as *'an employment area but with complementary mixed-uses including residential, commercial, retail and open space. The Plan-led strategy will ensure that development takes place in a manner that will attract investment and employment and provide for sustainable living'*.
The proximity of the proposed development to public transport	The proposed development is located within 10 minutes walk of two stops on the Luas Green Line and a number of stops for city bus services.
The precise nature and characteristics of the proposed development	The proposed development is a build -to-rent of 207 apartments in 3 blocks with a further 336 units proposed on the contiguous site.

Appropriate mix of land uses within and surrounding the proposed development.	The surrounding area includes residential, commercial, retail and open space in addition to high capacity public transport.
The availability of on-street parking controls in the immediate area.	Pay and Display car parking under the auspices of Dun Laoghaire Rathdown County Council is operational on the surrounding streets
The implementation of a Travel Plan for the proposed development where a significant modal shift towards sustainable travel modes can be achieved.	The proposed development includes a Travel Plan prepared in accordance with in accordance with Section 8.2.4.3 of Dun Laoghaire Rathdown County Development Plan 2016 – 2022.
Other agreed special circumstances where it can be justified on sustainability grounds	Car parking is being provided at the same rate as other SHD developments.

10.12 Compliance with Adopted DLR Development Plan 2022-2028

The compliance of the proposed development with Section 12.4.5 *Car Parking Standards* of the DLR County Development Plan 2022 – 2028 is demonstrated in Table 14 below.

This section of the Adopted Development Plan provides for reduced car parking standards for any development (residential and non-residential) on the basis of compliance with the criteria in Section 12.4.5.2 of the Adopted Development Plan.

Table 14 Parking Compliance with Section 12.4.5.2 of DLR Development Plan 2022-2028

Criterion	Compliance
Proximity to public transport services and level of service and interchange available.	The proposed development is located within 10 minutes walk of two stops on the Luas Green Line and a number of stops for city bus services.
Walking and cycling accessibility/permeability and any improvement to same	The development is in an area with a highly developed network of footpaths to be augmented by the Sandyford Business District Pedestrian and Cycle Improvement Scheme.
The need to safeguard investment in sustainable transport and encourage a modal shift	The proposed development is to be located adjacent to the Luas Green Line and highly developed cycle and pedestrian networks.
Availability of car sharing and bike / e-bike sharing facilities.	2 car parking spaces are being reserved within the development for car sharing. Other car sharing bases are located in the surrounding area within a short walking distance.

Existing availability of parking and its potential for dual use	Pay and Display car parking under the auspices of Dun Laoghaire Rathdown County Council is operational on the surrounding streets
Particular nature, scale and characteristics of the proposed development	The proposed development is a build -to-rent of 207 apartments in 3 blocks with a further 336 units proposed on the contiguous site.
The range of services available within the area.	The surrounding area includes residential, commercial, retail and open space in addition to high capacity public transport.
Impact on traffic safety and the amenities of the area.	The impact of the proposed development will be slight.
Capacity of the surrounding road network.	The capacity of the surrounding road network is more than adequate for the demand.
Urban design, regeneration and civic benefits including street vibrancy.	The Sandyford Business District in which the development is to be located is described in the Sandyford Urban Framework Plan primarily as *'an employment area but with complementary mixed-uses including residential, commercial, retail and open space. The Plan-led strategy will ensure that development takes place in a manner that will attract investment and employment and provide for sustainable living'*.
Robustness of Mobility Management Plan to support the development.	The proposed development includes a Travel Plan prepared in accordance with in accordance with Section 8.2.4.3 of Dun Laoghaire Rathdown County Development Plan 2016 – 2022.
The availability of on street parking controls in the immediate vicinity.	Pay and Display car parking under the auspices of Dun Laoghaire Rathdown County Council is operational on the surrounding streets
Any specific sustainability measures being implemented	Car parking is being provided at the same rate as other SHD developments.

11. Cycle Parking

11.1 Cycle Parking Required

Standards for residential cycle parking are set out '*Standards for Cycle Parking and associated Cycling Facilities for New Developments*, Dun Laoghaire Rathdown County Council, January 2018.

The cycle parking standards for residential developments are reproduced below.

Table 4.1 Cycle parking for residential development

Residential Development type	1 short stay (visitor) parking space per: (Minimum of 2 spaces)	1 long stay parking space per: (Minimum of 2 spaces)
Apartments, Flats, Sheltered housing	5 units	1 unit
Houses - 2 bed dwelling	5 units	1 unit
Houses - 3+ bed dwelling	5 units	1 unit
Sheltered housing	5 units	1 unit
Student Accommodation	5 bedrooms	2 bedrooms

Calculations for the quantum of cycle parking both short-term (visitor) and long-term (residents) required for the proposed development are set out in Tables 14 and 15.

Table 15 Cycle Parking Required – Short Stay (visitor)

Land Use	Units	Standard	Required
Studio	48	1 per 5 units	10
1 - Bed	103	1 per 5 units	20
2 - Bed	55	1 per 5 units	11
3 - Bed	1	1 per 5 units	1
Total	207		42

Table 16 Cycle Parking - Long Stay (Residents)

Land Use	Units	Standard	Required
Studio	48	1 per unit	48
1 - Bed	103	1 per unit	103
2 - Bed	55	1 per unit	55
3 - Bed	1	1 per unit	1
Total	208		207

11.2 Cycle Parking Provided

Cycle parking is proposed at Lower Ground Level as follows:

Short Stay (Visitor)	48 spaces
Long Stay (Residents)	240 spaces
Total	288 spaces

11.3 Access to Cycle Parking

Access to the cycle parking on the former Tack Packaging site will be from a 1.75 metre wide dedicated access directly off Ravens Rock Road contiguous to the new cycle track to be provided by DLRCC on Carmanhall Road as part of the Sandyford Business District Pedestrian and Cycle Improvement Scheme.

12. Trip Generation and Assignment

12.1 Scenario Assessed

During the preparation of this T & TA, two alternative scenarios were considered as part of the assessment of the traffic impact of this development.

Firstly, to assess the traffic impact of a residential development on the subject site.

Secondly, to assess the subject site in conjunction with the adjoining site as a single development for traffic purposes. For reasons of this latter option was selected and the developments on the two sites assessed as a single development on a single site.

Accordingly, the development assessed in terms of traffic impact comprised

- A total of 543 residential units 207 units on Tack + 336 units on Avid).
- A total of 197 car parking spaces (79 spaces in Tack + 118 spaces in Avid).
- Entrances from Ravens Rock Road and from Carmanhall Road.
- Exits onto Carmanhall Road and onto Blackthorn Road.
- Internal road layout connecting both developments.

12.2 Modal Split

The target modal split for the combined development reproduced from the Travel Plans for the two individual developments is presented in Table 16 for 2026 and 2031. A total of 150 persons are predicted to drive to work in 2026 reducing to 122 persons in 2031 compared to 584 persons travelling by public transport in 2026 increasing to 588 persons in 2031.

Table 17 Predicted Modal Split for the Combined Developments

	2026		2031	
	Modal Split	Persons	Modal Split	Persons
Walk	20.0%	243	21.0%	255
Cycle	6.0%	73	7.0%	85
Bus	20.0%	243	19.3%	235
Luas	28.0%	341	29.0%	353
Motorcycle	0.3%	4	0.3%	4
Car Driver	12.3%	150	10.0%	122
Car Passenger	3.0%	37	3.0%	37
Go Car (Car Share)	0.4%	5	0.4%	5
Work at Home	10.0%	122	10.0%	122
Total	100.0%	1,217	100.0%	1,217

12.3 Trip Generation

The assumed trip generation for the proposed development is presented in Table 17. The trip rates are based on the TRICS database adjusted for projected modal split, reduced provision of car parking and high availability of public transport services.

Table 18 Trip Generation

Time	Size	Trip Rate per Unit		Trips	
		Arrivals	Departures	Arrivals	Departures
AM Peak	543 units	0.057	0.182	31	99
PM Peak		0.140	0.068	76	37

The totals of arrivals and departures is predicted to be 130 vehicles per hour in the AM Peak and 113 vehicles per hour in the PM Peak.

12.4 Trip Assignment

The assumed trip distribution and assignment for the proposed development for this development is set out below and illustrated in Figure 38.

Arrivals

Carmanhall Road Entrance: 61%

51% from Blackthorn Road and 10% from Carmanhall Road (west).

Ravens Rock Road Entrance: 39%

32% from Carmanhall Road and 6% from Three Rock Road.

Departures

Carmanhall Road Entrance: 38%

28% to Blackthorn Road and 10% to Carmanhall Road (west).

Blackthorn Road Entrance: 62%

62% to Blackthorn Road (north).

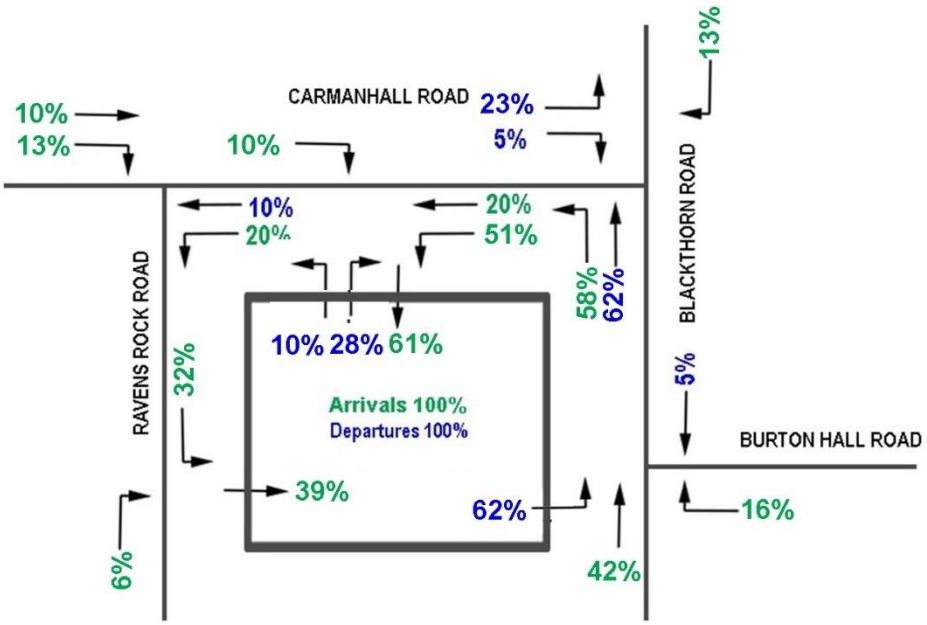


Figure 38 Trip Distribution and Assignment

12.5 Development Generated Trips

The development generated trips from Table 17 for the AM Peak Hour allocated to the surrounding road network in accordance with the trip distribution for arrivals and departures illustrated in Figure 38 are presented in Figure 39.

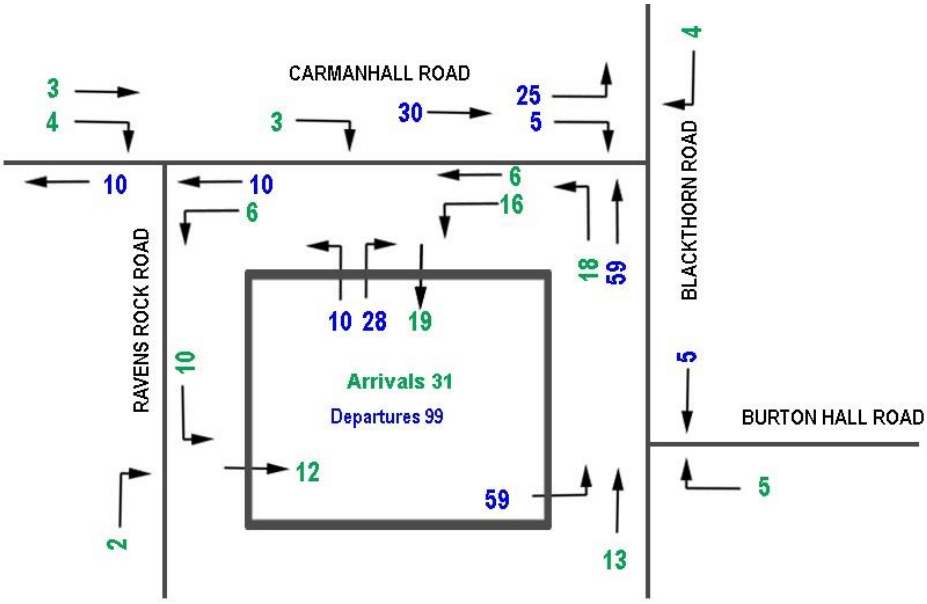


Figure 39 Development Generated Trips – AM Peak Hour

12.6 Junction Flows Post Development excluding ESB Link Road

The junction movements post development excluding the traffic diversion impact of the ESB Link Road are presented in Figures 40 – 42 for the Opening Year 2026, Design Year 2031 and Future Year 2041.

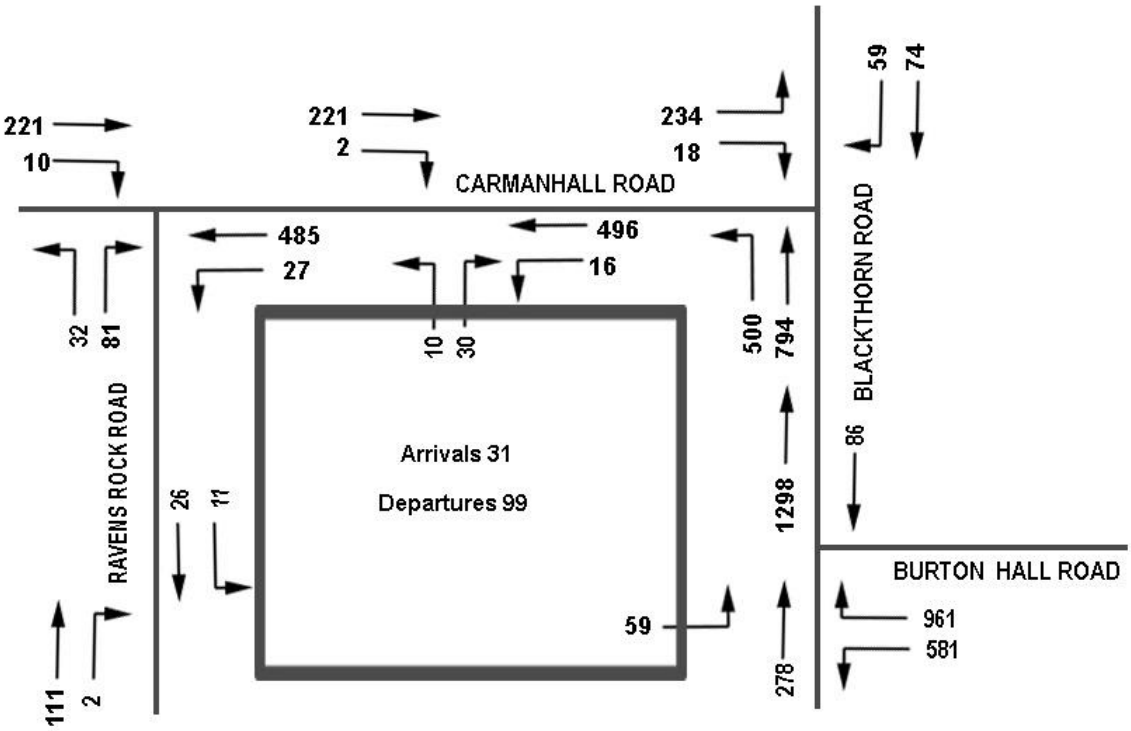


Figure 40 Junction Flows Post Development 2026 excluding ESB Link Road

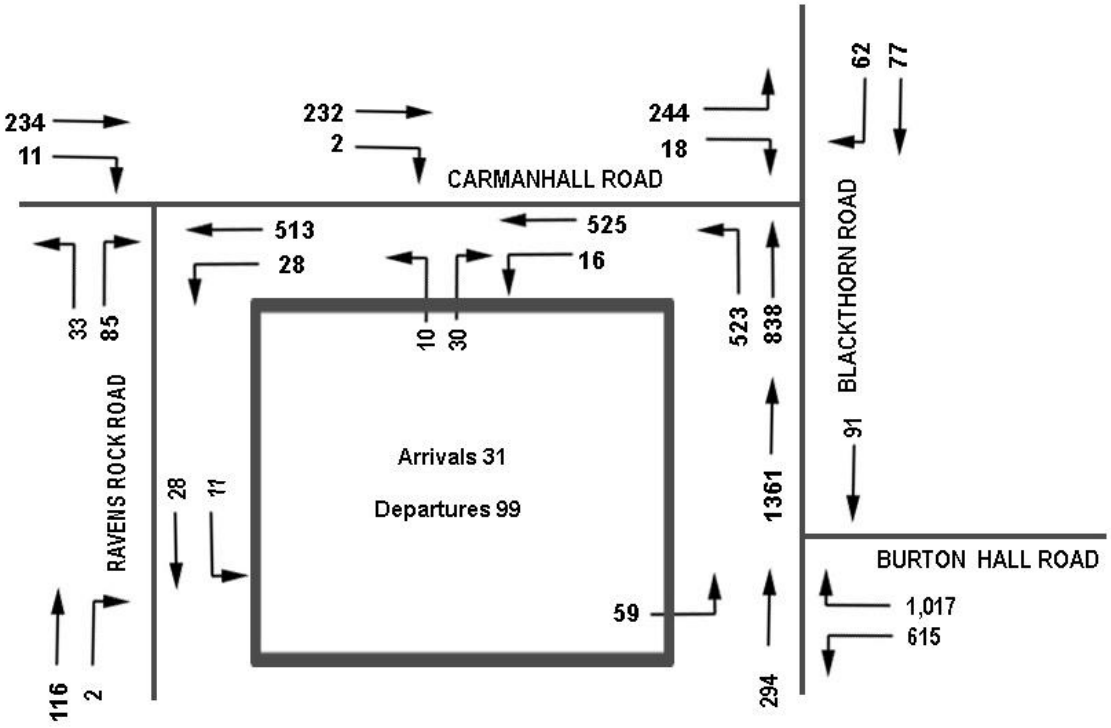


Figure 41 Junction Flows Post Development 2031 excluding ESB Link Road

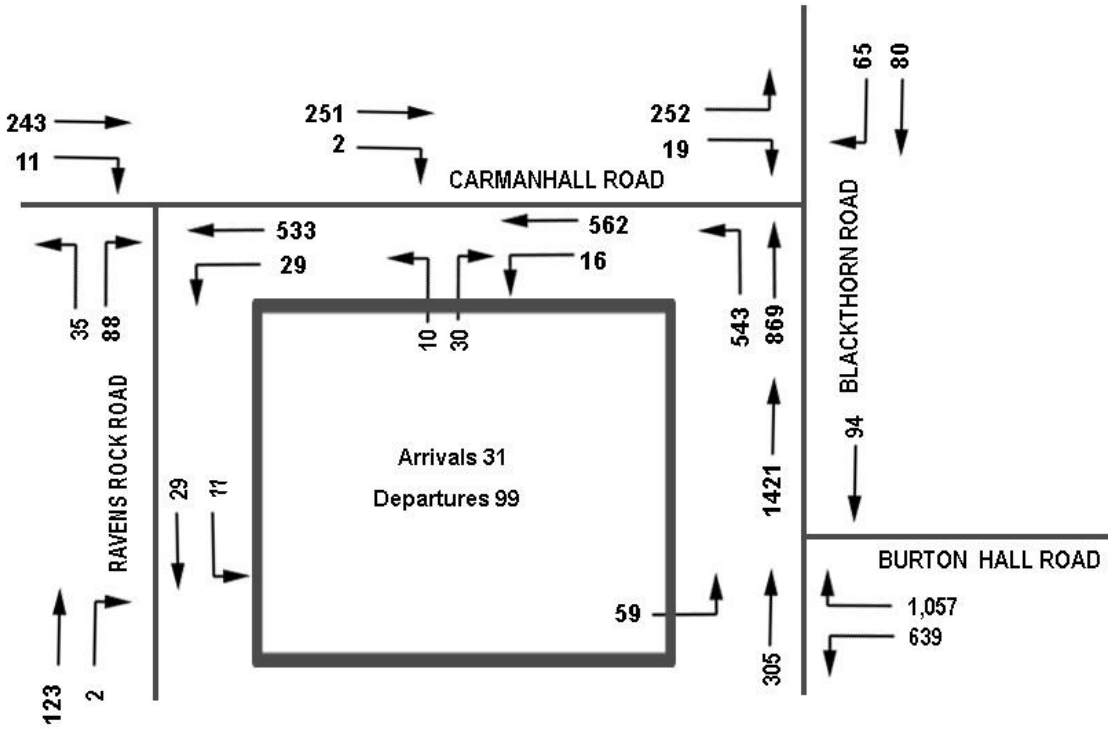


Figure 42 Junction Flows Post Development 2041 excluding ESB Link Road

13. Junction Assessment

13.1 Junctions Assessed

The junctions assessed for traffic movements post development in the Opening Year 2026, Design Year 2031 and Future Year 2041 were:

- Junction 1: Ravens Rock Road / Carmanhall Road
- Junction 2: Carmanhall Road / Blackthorn Road
- Junction 3: Blackthorn Road / Burton Hall Road
- Junction 4: Site Access – Ravens Rock Road
- Junction 5: Site Access – Carmanhall Road
- Junction 6: Site Access – Blackthorn Road

13.2 Junction Layouts

The layouts for the six junctions assessed are presented in Figures 43 - 48 below.

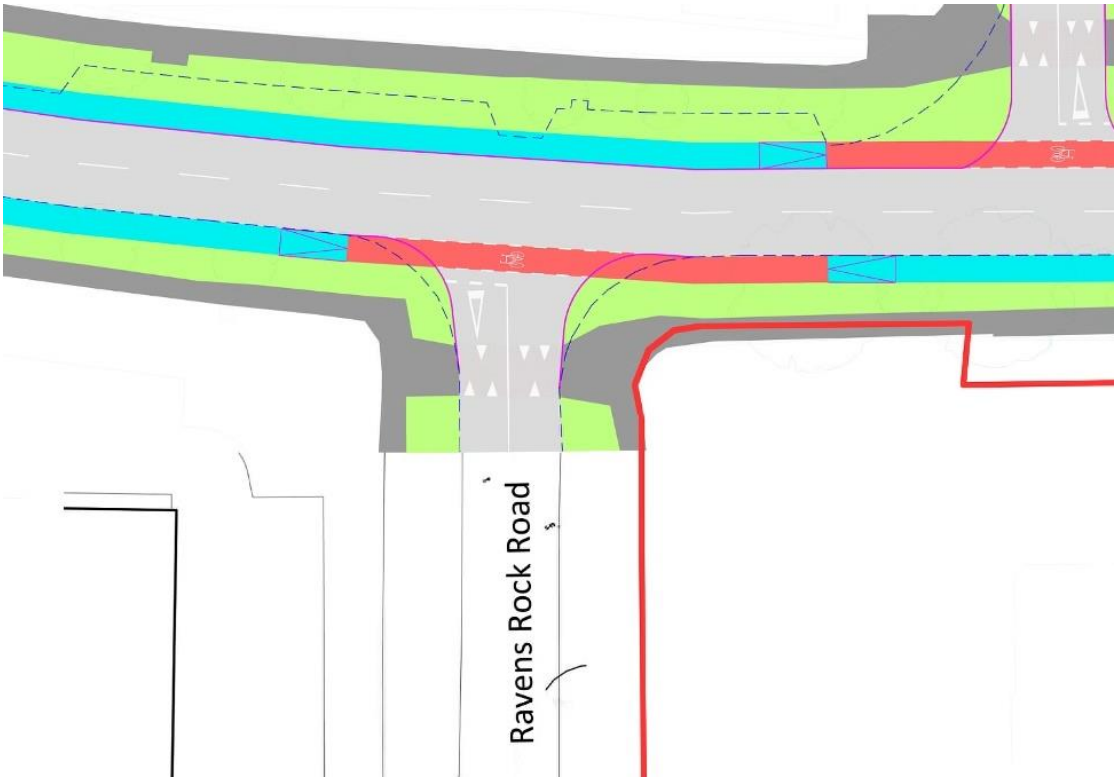


Figure 43 Junction 1: Ravens Rock Road / Carmanhall Road

(Priority junction with traffic lane width of 3.25 m)

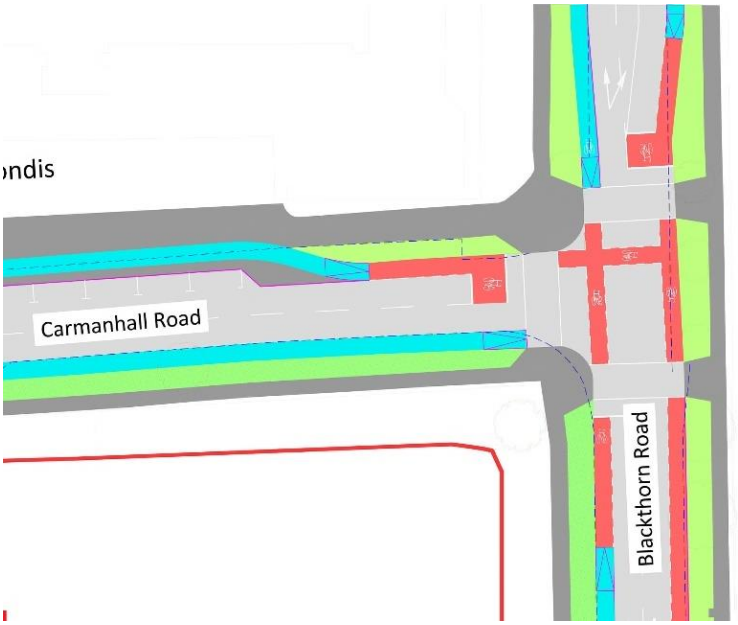


Figure 44 Junction 2: Carmanhall Road / Blackthorn Road

(Signalised junction with traffic lane width of 3.25 m)

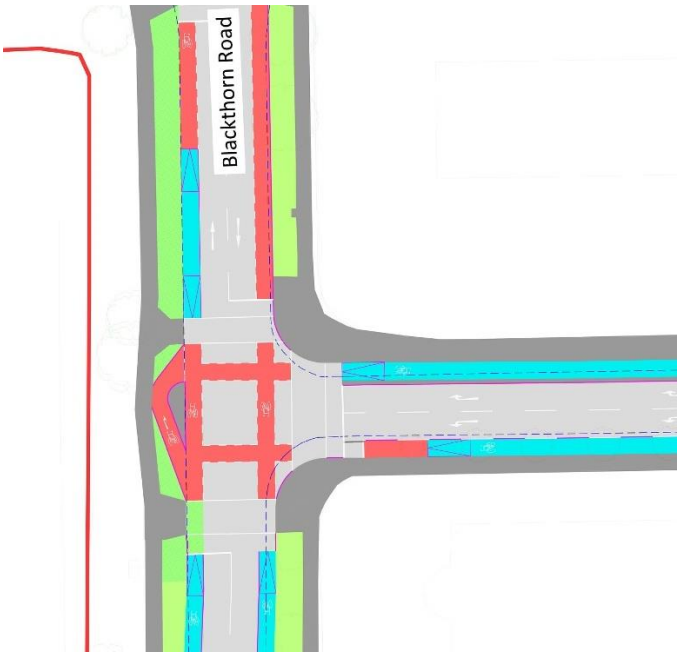


Figure 45 Junction 3 Blackthorn Road / Burton Hall Road

(Signalised Junction with traffic lane width of 3.25 m)

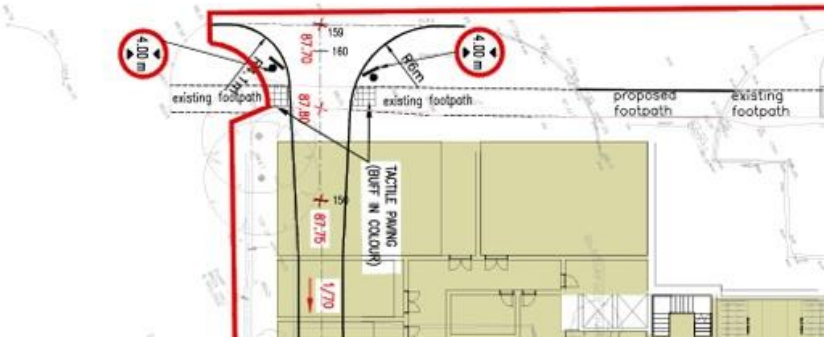


Figure 46 Junction 4: Site Access - Ravens Rock Road

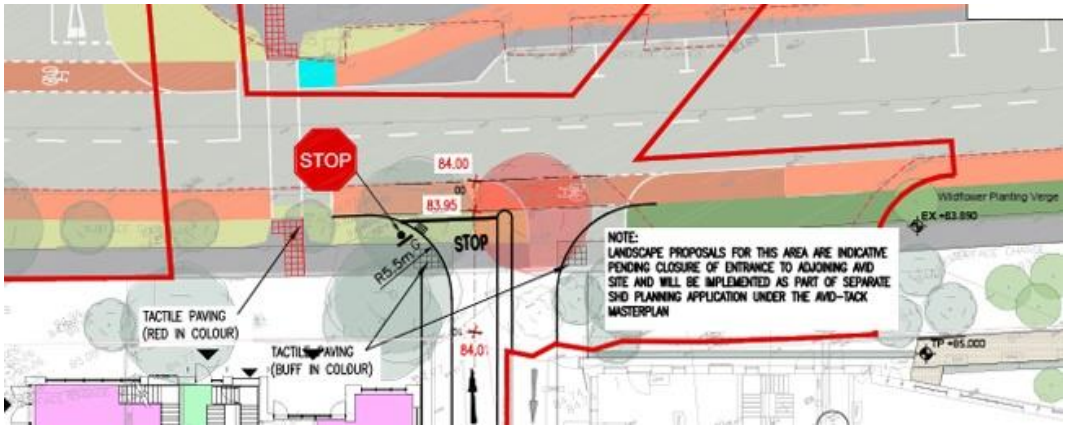


Figure 47 Junction 5: Site Access – Carmanhall Road

(Traffic lane widths 3.0m internal and 3.25m external)

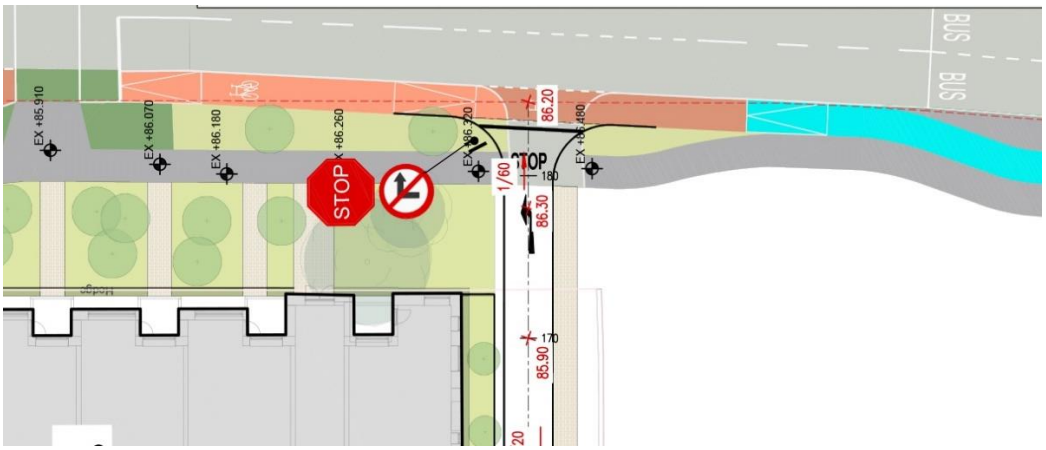


Figure 48 Junction 6: Site Access – Blackthorn Road

(Traffic lane widths 3.0m internal and 3.25m external)

13.3 Junction Movements

The junction movements for the junctions in the Opening Year 2026, Design Year 2031 and Future Year 2041 are presented in Figures 49 – 51 below.

These movements were obtained by adding the development generated flows from Figure 39 to the base flows from Figures 35 – 37.

Figures 35 - 37 and 49 – 51 include the traffic diversion impact of the ESB Link Road

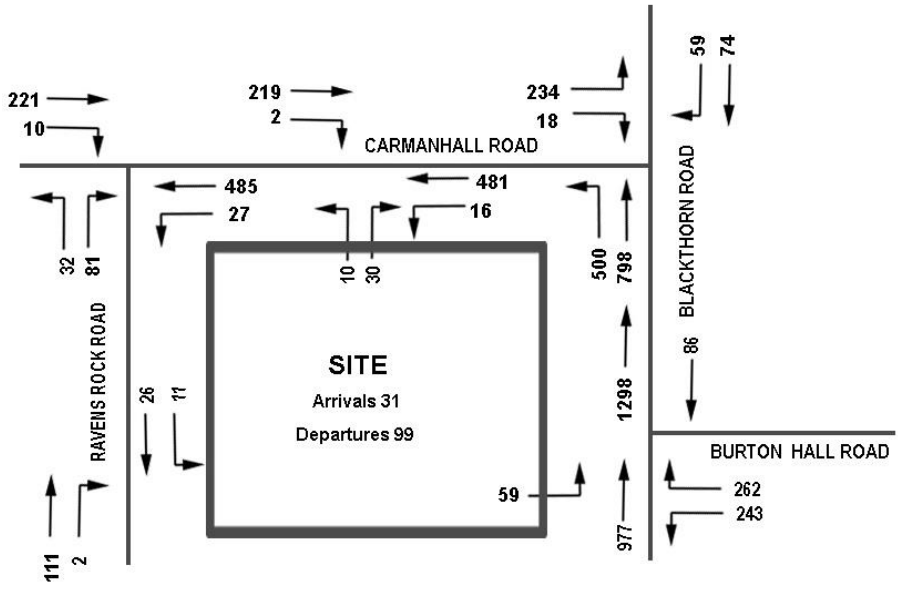


Figure 49 Traffic Flows Post Development - AM Peak - Opening Year 2026

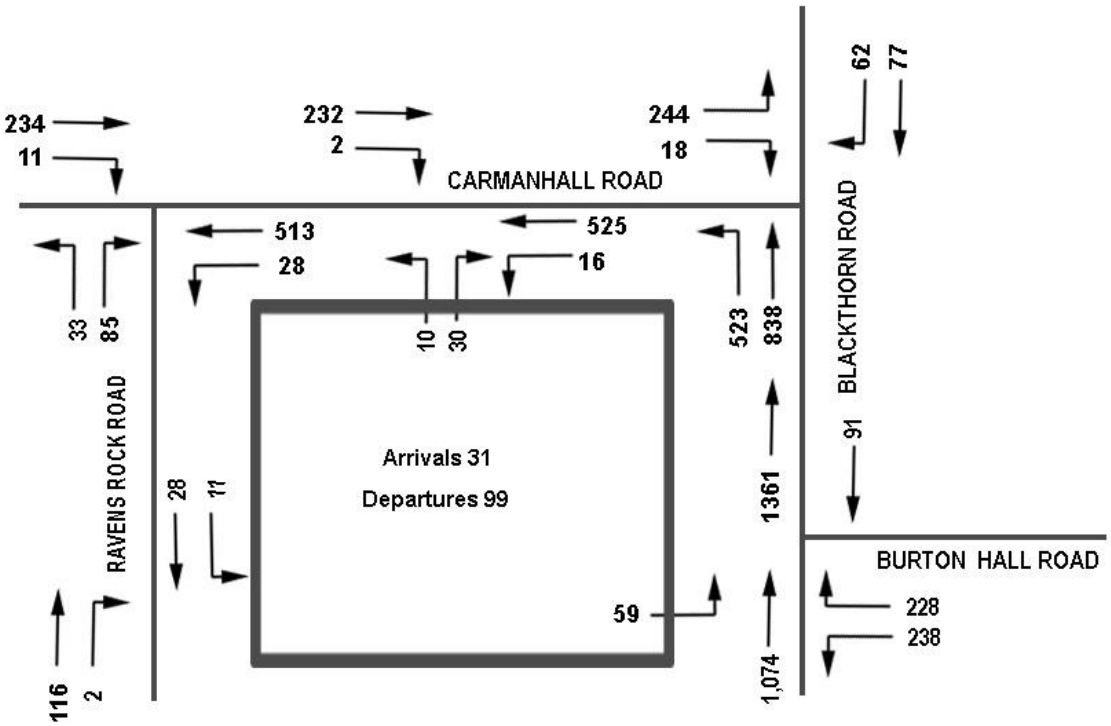


Figure 50 Traffic Flows Post Development - AM Peak – Design Year 2031

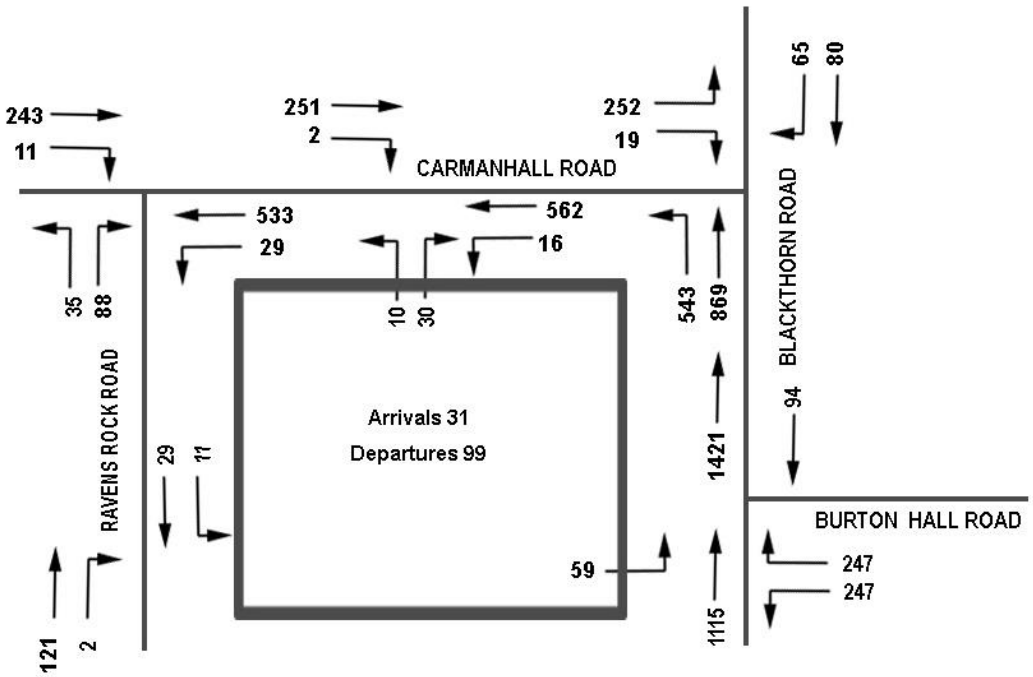


Figure 51 Traffic Flows Post Development - AM Peak – Future Year 2041

13.4 Junction Assessment – Priority Junctions

13.4.1 Priority Junctions

The operation of the priority junctions was modelled using the computer program PICADY.

The input comprised the junction layout for Junctions 1, 4, 5, and 6 from Figures 43 and 46 - 48 together with the traffic movements from Figures 49 - 51.

PICADY (Priority Intersection CApacity and DelaY) is a software package for predicting capacities, queue lengths and delays (both queueing and geometric) at non-signalised major/minor priority junctions. It models three and four-arm unsignalised give-way intersections using well-established capacity relationships which take into account key geometries such as road widths, visibility, the space available for traffic making an offside turn, and so on.

The output report from a PICADY model includes a number of results to evaluate an assessed junction, such as Ratio of Flow to Capacity (RFC), Queue and Delay for each lane approaching the junction.

13.4.2 Signalised Junctions

The operation of signalised junction assessed using the computer program TRANSYT.

The input comprised the junction layout for Junctions 2 and 3 from Figures 44 and 45 together with the traffic movements from Figures 41 - 50.

The output report of a TRANSYT model includes a number of results to evaluate an assessed junction, such as Degree of Saturation percentage (DOS%) figure, Mean Maximum Queue (MMQ) and Mean Delay per Vehicle for each lane approaching the junction.

Degree of Saturation (DOS):

DOS is a measure of performance which represents the capacity of a junction/traffic lane/link to accommodate the vehicular demand and indicates how near the network is to the maximum capacity available. A DOS less than 85% generally indicates that adequate capacity is available, and vehicles are not expected to experience significant queues and delays. As the DOS approaches 100%, traffic flow may become unstable, and delay and queuing conditions may occur.

Mean Maximum Queue (MMQ):

MMQ is the highest estimated mean number of Passenger Car Units (pcu) queued in any lane of a junction approach link, averaged over the entire analysis period.

Mean Delay per Vehicle (seconds):

Mean Delay per vehicle is the average delay experienced by a vehicle on a junction traffic stream as a result of having to queue at signals.12.4.2 Signalised Junction at Junction Blackthorn Road and Carmanhall Road.

13.5 Results of Junction Assessment

13.5.1 Priority Junction 1 (Junction Carmanhall Road and Ravens Rock Road)

Junction 1 is an existing priority junction between Ravens Rock Road and Carmanhall Road. The junction has been modelling in its current configuration using PICADY. The arms of the junction were labelled as follows:

- Arm A: Carmanhall Road (West)
- Arm B: Raven Rock Road
- Arm C: Carmanhall Road (East)

The results of the assessment are presented in Table 18. From this table, it will be seen that, post development, the junction will remain under capacity from the Opening Year of 2026 through to the Future Year of 2041 with the development in place. The maximum RFC predicted in 2041 some 19 years ahead was 0.27 with a corresponding maximum queue of 14 vehicles.

Table 19 Junction 1 - PICADY Results

Junction 1 – Ravens Rock Road / Carmanhall Road			
Stream	**Queue (PCU)**	**Delay (s)**	**RFC**
	Baseline 2022		
Stream B-C	0.1	7.76	0.07
Stream B-A	0.3	11.49	0.21
Stream C-AB	0.0	5.37	0.01
	Baseline 2026		
Stream B-C	0.1	7.97	0.07
Stream B-A	0.3	12.04	0.23
Stream C-AB	0.0	5.37	0.01
	Baseline 2031		
Stream B-C	0.1	8.19	0.08
Stream B-A	0.3	12.68	0.25
Stream C-AB	0.0	5.36	0.01
	Baseline 2041		
Stream B-C	0.1	8.39	0.08
Stream B-A	0.4	13.18	0.26
Stream C-AB	0.0	5.36	0.02
	Baseline 2026 with Development		
Stream B-C	0.1	8.04	0.07

Stream B-A	0.3	12.28	0.23
Stream C-AB	0.0	5.42	0.02
	Baseline 2031 with Development		
Stream B-C	0.1	7.87	0.07
Stream B-A	0.3	11.81	0.22
Stream C-AB	0.0	5.38	0.02
	Baseline 2041 with Development		
Stream B-C	**0.1**	**8.46**	**0.08**
Stream B-A	**0.4**	**13.47**	**0.27**
Stream C-AB	**0.0**	**5.42**	**0.03**

13.5.2 Signalised Junction 2 (Junction Carmanhall Road / Blackthorn Road)

Junction 2 is an existing priority junction between Carmanhall Road and Blackthorn Road.

As part of the Sandyford Business District Pedestrian and Cycle Priority Scheme being developed by DLRCC for 2023, it is proposed that this junction would be upgraded to a signalised junction.

Priority Option

In this T&TA, the junction was first modelled in its current priority configuration using PICADY. The arms of the junction were labelled out as follows:

- Arm A: Blackthorn Road (South)
- Arm B: Carmanhall Road
- Arm C: Blackthorn Road (North)

The results of the assessment are presented in Table 19. From this table, it will be seen that, post development under priority control, the junction will remain under capacity from the Opening Year of 2026 through to the Future Year of 2041 with the development in place. The maximum RFC predicted in 2041 some 19 years ahead was 0.56 with a corresponding maximum queue of 19 vehicles.

Table 20 Junction 2 - PICADY Results

Junction 2 – Carmanhall Road/Blackthorn Road			
Stream	**Queue (PCU)**	**Delay (s)**	**RFC**
	Baseline 2022		
Stream B-C	0.7	12.62	0.42
Stream B-A	0.1	15.63	0.05
Stream C-AB	0.3	11.17	0.18
	Baseline 2026		
Stream B-C	1.0	15.57	0.49
Stream B-A	0.1	18.82	0.07
Stream C-AB	0.3	12.54	0.21
	Baseline 2031		
Stream B-C	0.7	12.62	0.42
Stream B-A	0.1	15.63	0.05
Stream C-AB	0.3	11.17	0.18
	Baseline 2041		
Stream B-C	1.3	19.10	0.56
Stream B-A	0.1	22.39	0.08
Stream C-AB	0.4	13.91	0.25

Signalised Option

The junction was also assessed using the layout proposed in the Sandyford Business District Pedestrian and Cycle Improvement Scheme.

As part of the proposed the Sandyford Business District Pedestrian and Cycle Improvement Scheme, the priority junction between Carmanhall Road and Blackthorn Road is proposed to be upgraded to a signalised T-junction. Accordingly, the junction was modelled as a signalised T-junction using TRANSYT software and the layout proposed in the Scheme. The signalised junction was labelled as follows:

- Arm A: Blackthorn Road (South)
- Arm B: Carmanhall Road
- Arm C: Blackthorn Road (North)

The results of the modelling which are presented in Table 20 show that the junction will remain within capacity with a maximum DOS of 96% in 2041.

It is understood at the time of writing in March 2022, that the detailed design of the signalisation of this junction is being undertaken by the project engineers for the Sandyford Business District Pedestrian and Cycle Improvement Scheme.

Table 21 Junction 2 - TRANSYT Results

Junction 2 – Carmanhall Road/Blackthorn Road			
2026 and Development			
Arm	Direction	DOS %	Queue (Vehicles)
A	S/L	90	40.78
B	R/L	79	10.09
C	S	6	0.80
	R	53	2.36
2031 and Development			
Arm	Direction	DOS %	Queue (Vehicles)
A	S/L	88	37.89
B	R/L	79	9.77
C	S	5	0.74
	R	51	2.24
2041 and Development			
Arm	Direction	DOS %	Queue (Vehicles)
A	S/L	96	55.54
B	R/L	89	12.48
C	S	6	0.85
	R	59	2.67

13.5.3 Signalised Junction 3 (Junction Blackthorn Road / Burton Hall Road)

Junction 3 is an existing signalised T-junction between Blackthorn Road and Burton Hall Road. This junction was modelled using TRANSYT with the arms labelled as follows.

- Arm A: Blackthorn Road (North)
- Arm B: Burton Hall Road
- Arm C: Blackthorn Road (South)

The results of the assessment are presented in Table 21. From this table, it will be seen that, post development, the junction will remain under capacity from the Opening Year of 2026 through to the Future Year of 2041 with the development. The maximum DOS predicted was 86% in 2026, xx% in 2031 and 94% in 2041.

Table 22 Junction 3 - TRANSYT Results

Baseline 2022			
Arm	Direction	DOS %	Queue (Vehicles)
A	S	64	3.03
B	L	48	9.55
	R	79	9.35
C	S	79	23.08
Baseline 2026			
Arm	Direction	DOS %	Queue (Vehicles)
A	S	68	3.29
B	L	68	8.11
	R	84	27.32
C	S	71	8.79
Baseline 2041			
Arm	Direction	DOS %	Queue (Vehicles)
A	S	74	3.85
B	L	82	9.64
	R	94	38.84
C	S	81	9.29
2026 and Development			
Arm	Direction	DOS %	Queue (Vehicles)
A	S	72	3.63
B	L	68	8.11
	R	86	28.52
C	S	73	9.09
	2031 and Development		
Arm	Direction	DOS %	Queue (Vehicles)
A	S		
B	L		
	R		
C	S		

2041 and Development			
Arm	Direction	DOS %	Queue (Vehicles)
A	S	78	4.31
B	L	87	10.43
	R	94	39.36
C	S	87	10.43

13.5.4 Priority Junction 4 (Site Access – Ravens Rock Road)

Junction 4 is the proposed site access point on Ravens Rock Road. This is proposed to be a one-way access point into the proposed development and the configuration is based on the proposed layout of the junction. The layout was labelled as follows:

- Arm A: Raven's Rock Road (North)
- Arm B: Site Access Road
- Arm C: Raven's Rock Road (South)

The results of this assessment are presented in Table 22. From this table, it will be seen that, post development, the junction will remain under capacity from the Opening Year of 2026 through to the Future Year of 2041 with the development.

Table 23 Junction 4 - PICADY Results

Stream	Queue (PCU)	Delay (s)	RFC
	2026 and Development		
Stream B-AC	0.0	0.00	0.00
Stream C-AB	0.0	5.64	0.00
	2031 and Development		
Stream B-AC	0.0	0.00	0.00
Stream C-AB	0.0	5.26	0.00
	2041 and Development		
Stream B-AC	0.0	0.00	0.00
Stream C-AB	0.0	5.21	0.00

13.5.5 Priority Junction 5 (Site Access Carmanhall Road)

Junction 4 is the proposed site access point on Carmanhall Road and the configuration is based on the proposed layout of the junction. The layout was labelled as follows:

- Arm A: Carmanhall Road (East)
- Arm B: Site Access Road
- Arm C: Carmanhall Road (West)

The results of this assessment are presented in Table 23. From this table, it will be seen that this junction will remain within capacity from 2026 through to 2041 with the development in place. The max RFC is predicted to be 0.13 with a corresponding queue of 0.1 vehicles.

Table 24 Junction 5 - PICADY Results

Junction 5 – Carmanhall Site Access Road			
Stream	**Queue (PCU)**	**Delay (s)**	**RFC**
	2026 and Development		
Stream B-AC	0.1	11.33	0.12
Stream C-AB	0.0	5.40	0.00
	2031 and Development		
Stream B-AC	0.1	11.31	0.12
Stream C-AB	0.0	5.42	0.00
	2041 and Development		
Stream B-AC	0.1	12.27	0.13
Stream C-AB	0.0	5.37	0.01

13.5.6 Priority Junction 6 (Site Access – Blackthorn Road)

Junction 4 is the proposed site access point on Blackthorn Road. This is a proposed site access, and the configuration is based on the proposed layout of the junction. The layout was labelled as follows:

- Arm A: Blackthorn Road (South)
- Arm B: Site Access Road
- Arm C: Blackthorn Road (North)

The results of this assessment are presented in Table 24. From this table, it will be seen that the junction will remain under capacity in 2026 through to 2041 with the development in place. The max with an RFC predicted is 0.18 with a corresponding queue of 0.2 vehicles.

Table 25 Junction 6 - PICADY Results

Junction 6 – Blackthorn Road – Site Access			
Stream	**Queue (PCU)**	**Delay (s)**	**RFC**
	2026 and development		
Stream B-AC	0.2	11.04	0.17
Stream C-AB	0.0	0.00	0.00
	2031 and development		
Stream B-AC	0.2	11.19	0.17
Stream C-AB	0.0	0.00	0.00
	2041 and development		
Stream B-AC	0.2	12.22	0.18
Stream C-AB	0.0	0.00	0.00

14. Traffic Impact

14.1 Road Junctions

The results of the assessment in Section 13 confirm that the three junctions on the surrounding road network will remain within capacity post development in the Opening Year 2026 through the Design Year in 2031 to the Future Year 2041.

The three junctions are

- Junction 1: Ravens Rock Road / Carmanhall Road
- Junction 2: Carmanhall Road / Blackthorn Road
- Junction 3: Blackthorn Road / Burton Hall Road

It is understood that Junction 2 at Carmanhall Road / Blackthorn Road is to be signalised as part of the Sandyford Business District Pedestrian and Cycle Improvement Scheme.

It is understood at the time of writing in March 2022 that the detailed design of the signalisation of this junction is being undertaken by the project engineers for the Sandyford Business District Pedestrian and Cycle Improvement Scheme.

This junction was demonstrated to work satisfactorily under priority control or signal control up to and including 2041 with the development in place.

14.2 Public Transport – Luas

14.2.1 Development Generated Trips

Based on a modal split of 28% - 29% of the combined population of 1,217 persons for the combined site, the projected number of trips on the Luas during the AM Peak is expected to be 341 in 2026 increasing to 353 trips in 2031. Of these., some 50% can be expected to travel during the AM Peak Hour 8 – 9.

In terms of direction, these trips are expected to be 80% northbound towards the City Centre and 20% southbound towards Brides Glen.

This distribution would generate 136 trips northbound in 2026 increasing to 141 trips in 2031.

The corresponding southbound trips would be 34 in 2026 increasing to 35 trips in 2031.

14.2.2 Luas Capacity v Demand AM Peak 2031

The expected demand for outbound Luas services during the AM Peak is summarised in Table 25.

Following completion of the Green Line Capacity Enhancement Scheme in 2019, the current capacity of the Green Line during the AM Peak is 6,300 passengers per hour in both directions compared to a peak loading of 4,648 passengers per hour inbound between the Milltown and Cowper Stops.

From this Table 25, it will be seen that the demand from the proposed development will have an insignificant impact on the capacity of the Luas Green Line through Sandyford.

Table 26 Luas Capacity and Demand AM Peak 2031

Direction	Demand	Capacity	Demand / Capacity
Northbound	136	6,300	2.1%
Southbound	34	6,300	0.6%
Total	170	12,600	2.7%

14.3 Public Transport - Bus Services

The projected demand for bus services during the AM Peak generated by the proposed development is some 243 persons in the Opening Year 2026 decreasing to 235 persons six years later in 2031. Of these, 50% can be expected to travel during the AM Peak Hour 08.00 – 09.00

This demand of 121 – 117 passengers per hour is well within the capacity of the existing bus services being some 6% of the capacity of 1,840 persons per hour provided on the bus services in the surrounding area.

The capacity of 1,840 persons after the implementation of the Bus Connects service improvements is based on

(a) 10 x double deck buses per hour in each direction x 80 passengers per bus (1,600 passengers)

(b) 3 coaches per hour in each direction x 40 passengers per coach (240 passengers).

14.4 Public Transport

The overall impact of the proposed development on the public transport services in the surrounding area is an increase of 2.7% on Luas services and 6% on bus services. These increases are well within the capacity of both services.

15. Summary

Introduction

This Traffic and Transport Assessment (T&TA) has been prepared by Waterman Moylan on behalf of Sandyford Environmental Construction Ltd to accompany a planning application to An Bord Pleanala (ABP) for a residential development on a brownfield site at the junction of Carmanhall Road and Ravens Rock Road, Sandyford, Dublin 18.

Description of Site

The subject site is located at Sandyford in south County Dublin. The site which has an area of 0.57ha (1.4 acre) is located at the junction of Carmanhall Road and Ravens Rock Road, Sandyford, Dublin 18. The existing vehicular access to the site is from Ravens Rock Road.

The site was formerly occupied by Tack Packaging but at the time of writing in March 2022, it was unoccupied save for a number of empty buildings.

The adjoining site to the east at the junction of Carmanhall Road and Blackthorn Road was formerly occupied by Avid Technology. It extends to 0.81 ha ((2.0 acre).

Proposed Development

The proposed development will comprise some 207 Build-to-Rent residential units. See Figure 3.

Car parking with a total of 79 car spaces will be provided at Lower Ground Level and Basement. Cycle parking with 288 spaces will be provided at Lower Ground Level. Access is proposed from Ravens Rock Road with egress onto Carmanhall Road.

The public realm around the site will incorporate an upgrade of the pedestrian and cycle environment including integration with the Sandyford Business District Pedestrian and Cycle Improvement Scheme.

The development includes all associated infrastructure to service the development including access junctions, footpaths and cycle paths together with a network of watermains, foul water drains and surface water drains.

Contiguous Development

A concurrent development with a separate Traffic & Transport Assessment on the former Avid Technology site to the east will comprise 336 Build-to-Rent residential units and 118 car parking spaces at Lower Ground Level and Basement. Access is proposed from Carmanhall Road and egress onto Blackthorn Road.

The traffic impact from this contiguous development has been incorporated into this T&TA.

Development Assessed

During the preparation of the T & TA for this development, two alternative scenarios were considered as part of the assessment of the traffic impact of this development. Firstly, to assess the traffic impact of a residential development on the subject site. Secondly, to assess the subject site in conjunction with the adjoining site as a single development for traffic purposes. For reasons of this latter option was selected and the developments on the two sites assessed as a single development on a single site.

Program

At the time of writing in March 2022, it is likely that construction of the proposed development could commence in 2023 for completion in 2026.

Projections are included for Design Year 2031 (Opening Year + 5) and Future Year 041 (Opening Year + 15).

Future Road and Cycle Schemes

During the preparation of this T & TA, Waterman Moylan were in contact with DLRCC Transportation in relation to two schemes which are being developed by Dun Laoghaire Rathdown County Council. These were : -

(a) ESB Link Road – Junction 14 Roundabout to Blackthorn Road.

(b) Sandyford Business District Pedestrian and Cycle Improvement Scheme.

Both schemes and their impact on the road network in the area of the subject site are described in this T & TA.

It is understood at the time of writing in March 2022, that both schemes are progressing to the tender stage for completion in 2023.

DLR County Development Plan 2016 – 2022

The requirements of the DLR County Development Plan in relation to Sustainable Travel and Transportation including roads, car parking, cycling and walking are identified in this report and their application in relation to the proposed development clarified.

Likewise, the requirements of the Sandyford Urban Framework Plan in relation to Sustainable Infrastructure Policies and Objectives.

Car Parking

The proposed provision of car parking will be 79 spaces calculated at the rate of 0.38 space per unit per unit for 208 units.

The provision of 79 spaces will include 3 spaces for disabled drivers (4%), 8 spaces with charging facilities for electric vehicles (10%) and 2 spaces for car sharing (GoCar).

Compliance is also demonstrated with development with Section 8.2.4.5 *Car Parking Standards* of the DLR County Development Plan 2016 – 2022 which provides for reduced car parking standards for any development (residential and non-residential) complying with certain criteria.

DLR County Development Plan 2022 – 2028

It is understood that the Adopted DLR County Development Plan 2022- 2028 will come into effect on 21st April 2022 after lodgement of the subject application.

Public Transport - Luas

The proposed development will be located adjacent to the Luas Green Line. The nearest Luas stops are Stillorgan and Sandyford both located on Blackthorn Avenue less than 0.5km to the north of the proposed development. Both stops are within 6 minutes walking distance.

Following completion of the Green Line Capacity Enhancement Scheme in 2019, the current capacity of the Green Line during the AM Peak is 6,300 passengers per hour in both directions compared to a peak loading of 4,648 passengers per hour inbound between Milltown and Cowper.

Based on a modal split of 28%, the peak demand from the proposed development is 341 passengers per hour equivalent to 2.7 % of the Green Line Capacity of 12,600 passengers per hour.

Public Transport - Bus

The combined development will be well served by stage bus services operated by a number of companies in the surrounding area. Bus stops are located on Burton Hall Road, Blackthorn Road, and Blackthorn Avenue less than 6 minutes' walk from the proposed development.

The projected demand for bus services during the AM Peak is some 121 passengers per hour. This demand is well within the capacity of the existing bus services being 6% of the capacity of 1,840 persons per hour provided on the bus services in the surrounding area.

Traffic Impact

During the preparation of this T & TA, two alternative scenarios were considered as part of the assessment of the traffic impact of this development.

Firstly, to assess the traffic impact of a residential development on the subject site.

Secondly, to assess the subject site in conjunction with the adjoining site as a single development for traffic purposes. For reasons of this latter option was selected and the developments on the two sites assessed as a single development on a single site.

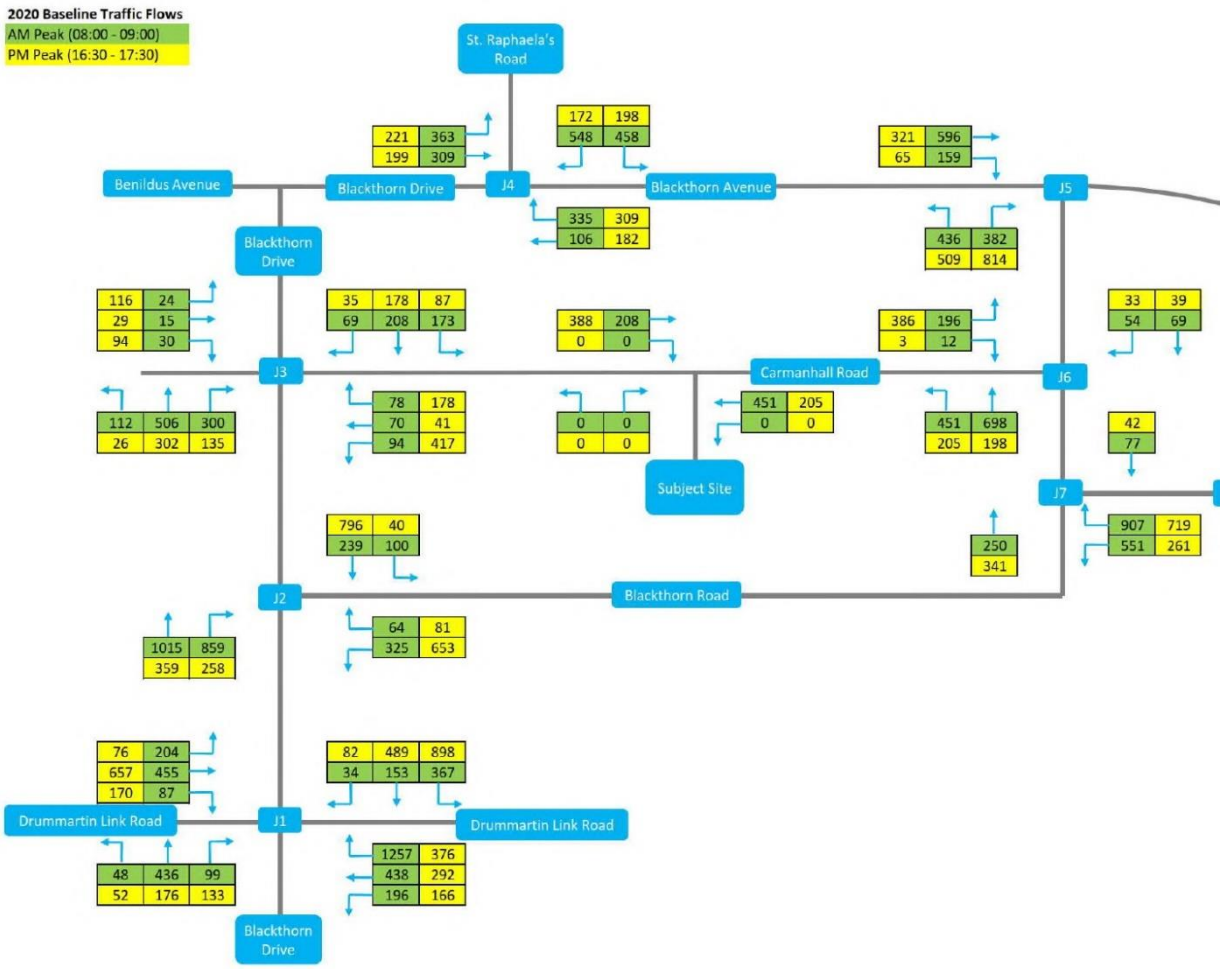
The results of the assessment confirmed that the junctions on the surrounding road network would remain within in capacity post development in in the Opening Year 2026 through the Design Year in 2031 to the Future Year 2041.

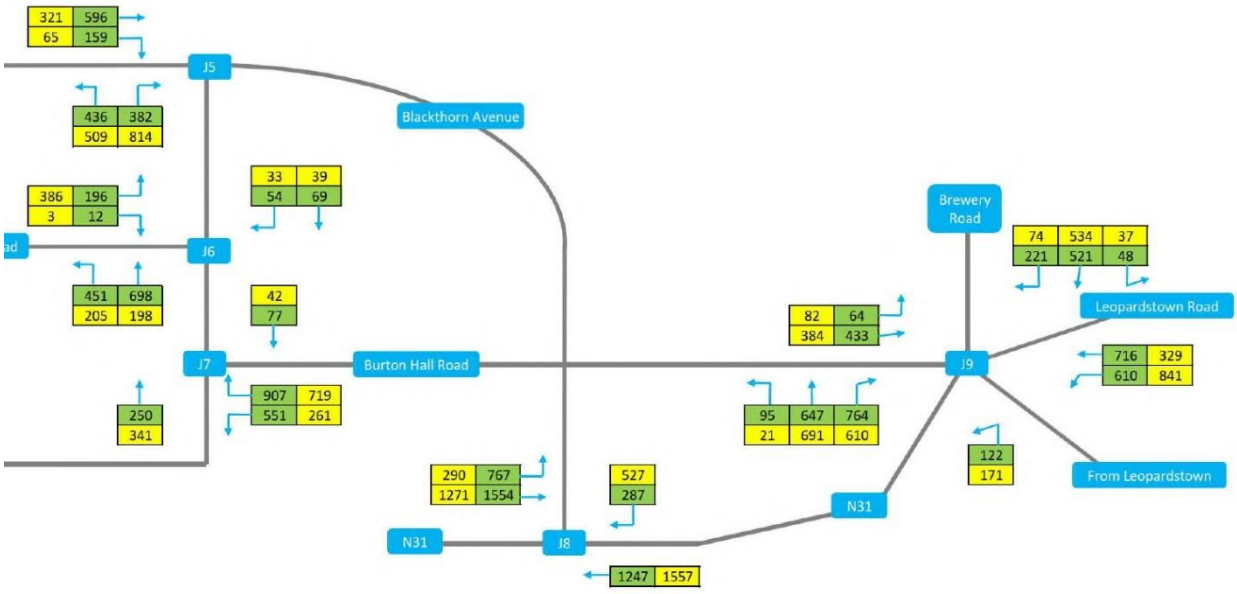
Summary

This T & TA demonstrates that the proposed development will be consistent with the objectives for Sustainable Travel and Transport set out in the DLR County Development Plan and the Sandyford Urban Framework Plan.

APPENDICES

A. Traffic Survey 2020


2020 Baseline Traffic Flows
AM Peak (08:00 - 09:00)
PM Peak (16:30 - 17:30)
St. Raphaela's Road
Benildus Avenue
Blackthorn Drive
J4
Blackthorn Avenue
J5
Blackthorn Drive
J3
Carmanhall Road
J6
Subject Site
J7
J2
Blackthorn Road
Drummartin Link Road
J1
Drummartin Link Road
Blackthorn Drive
221 363
199 309
172 198
548 458
321 596
65 159
335 309
106 182
436 382
509 814
116 24
29 15
94 30
35 178 87
69 208 173
388 208
0 0
386 196
3 12
33 39
54 69
112 506 300
26 302 135
78 178
70 41
94 417
0 0
0 0
451 205
0 0
451 698
205 198
42
77
796 40
239 100
907 719
551 261
250
341
64 81
325 653
1015 859
359 258
76 204
657 455
170 87
82 489 898
34 153 367
48 436 99
52 176 133
1257 376
438 292
196 166


321 596
65 159
J5
436 382
509 814
Blackthorn Avenue
386 196
3 12
33 39
54 69
J6
451 698
205 198
42
77
J7
Burton Hall Road
907 719
551 261
250
341
290 767
1271 1554
527
287
N31
J8
1247 1557
82 64
384 433
95 647 764
21 691 610
Brewery Road
J9
74 534 37
221 521 48
Leopardstown Road
716 329
610 841
122
171
From Leopardstown
N31

B. Traffic Survey 2022

Data Analysis Services
Traffic-Transportation-Commercial Innovation

012 21459 Avid & TAC Packaging Site - Traffic Surveys

with compliments

IDASO

Survey Name: 012 21459 Avid & TAC Packaging Site - Traffic Surveys
Date: Tue 11 Jan 2022

IDASO

Survey Name: 012 21459 Avid & TAC Packaging Site - Traffic Surveys
Site: Site 1
Location: Blackthorn Road/Carmanhall Road
Date: Tue 11-Jan-2022

	A => A										A => B										A => C									
TIME	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	3	3	0	0	1	0	1	1	0	0	3	3.5
07:15	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	0	4	4	0	0	5	0	1	0	0	0	6	6
07:30	0	0	0	0	0	0	0	0	0	0	0	0	5	0	1	0	0	0	6	6	0	0	1	0	1	0	0	0	2	2
07:45	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	7	7	1	0	8	0	1	0	0	0	10	9.2
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	17	0	3	0	0	0	20	20	1	0	15	0	4	1	0	0	21	20.7
08:00	0	0	0	0	0	0	0	0	0	0	0	0	12	0	0	0	0	0	12	12	1	0	7	0	0	0	0	0	8	7.2
08:15	0	0	0	0	0	0	0	0	0	0	0	0	12	0	1	0	0	0	13	13	0	0	10	0	2	0	0	0	12	12
08:30	0	0	0	0	0	0	0	0	0	0	0	0	13	0	2	0	0	0	15	15	0	0	5	0	1	0	0	0	6	6
08:45	0	0	0	0	0	0	0	0	0	0	0	0	18	0	0	0	0	0	18	18	0	1	7	1	1	1	0	0	11	10.9
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	55	0	3	0	0	0	58	58	1	1	29	1	4	1	0	0	37	36.1
09:00	0	0	0	0	0	0	0	0	0	0	0	0	11	0	2	0	0	0	13	13	0	1	8	0	0	0	0	0	9	8.4
09:15	0	0	0	0	0	0	0	0	0	0	0	1	7	0	2	0	0	0	10	9.4	0	0	7	0	1	0	0	0	8	8
09:30	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2	0	0	5	1	2	0	0	0	8	8
09:45	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	1	0	0	5	5.5	0	0	6	0	2	2	0	0	10	11
H/TOT	0	0	0	0	0	0	0	0	0	0	0	1	24	0	4	1	0	0	30	29.9	0	1	26	1	5	2	0	0	35	35.4
10:00	0	0	0	0	0	0	0	0	0	0	0	1	4	0	1	1	0	0	7	6.9	0	0	1	0	3	1	0	0	5	5.5
10:15	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	0	0	0	4	4	0	0	5	0	0	1	0	0	6	6.5
10:30	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	3	3	0	0	1	0	2	0	0	0	3	3
10:45	0	0	0	0	0	0	0	0	0	0	0	0	4	0	1	1	0	0	6	6.5	0	0	4	0	2	0	0	0	6	6
H/TOT	0	0	0	0	0	0	0	0	0	0	0	1	11	1	5	2	0	0	20	20.4	0	0	11	0	7	2	0	0	20	21
11:00	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	5	5	0	0	3	0	0	0	0	0	3	3
11:15	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	5	5	0	0	6	0	1	0	0	0	7	7
11:30	0	0	0	0	1	0	0	0	1	1	0	0	3	0	0	0	0	0	3	3	0	0	0	0	1	0	0	0	1	1
11:45	0	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0	0	0	5	5	0	0	5	0	0	0	0	0	5	5
H/TOT	0	0	0	0	1	0	0	0	1	1	0	0	17	0	1	0	0	0	18	18	0	0	14	0	2	0	0	0	16	16
12:00	0	0	0	0	0	0	0	0	0	0	1	0	5	0	1	1	0	0	8	7.7	0	0	6	1	0	0	0	0	7	7
12:15	0	0	0	0	0	0	0	0	0	0	0	0	5	0	1	0	0	0	6	6	0	0	3	0	1	1	0	0	5	5.5
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12:45	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	4	4	1	0	8	1	3	0	0	0	13	12.2
H/TOT	0	0	0	0	0	0	0	0	0	0	1	0	20	1	5	1	0	0	28	27.7	1	0	21	2	5	1	0	0	30	29.7
13:00	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	3	0	0	5	0	3	0	0	0	8	8
13:15	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	4	4	0	0	1	0	0	0	0	0	1	1
13:30	0	0	0	0	0	0	0	0	0	0	0	0	5	0	1	0	0	0	6	6	0	0	9	0	3	0	0	0	12	12
13:45	0	0	0	0	0	0	0	0	0	0	0	0	8	1	0	0	0	0	9	9	0	0	4	0	1	0	0	0	5	5
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	19	2	1	0	0	0	22	22	0	0	19	0	7	0	0	0	26	26
14:00	0	0	0	0	0	0	0	0	0	0	0	0	5	0	3	0	0	0	8	8	0	0	2	0	1	0	0	0	3	3
14:15	0	0	0	0	0	0	0	0	0	0	0	0	5	0	2	0	0	0	7	7	0	0	2	0	0	0	0	0	2	2
14:30	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	1	0	0	6	6.5	0	0	0	0	0	0	0	0	0	0
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H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	23	0	7	1	0	0	31	31.5	0	0	10	1	2	0	0	0	13	13
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H/TOT	0	0	0	0	0	0	0	0	0	0	0	1	32	1	6	0	0	0	40	39.4	1	1	18	0	6	0	0	0	26	24.6
16:00	0	0	0	0	0	0	0	0	0	0	0	0	6	0	1	0	0	0	7	7	0	0	9	0	1	0	0	0	10	10
16:15	0	0	0	0	0	0	0	0	0	0	0	1	4	1	2	0	0	0	8	7.4	0	0	4	0	6	0	1	0	11	12.3
16:30	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	5	5	0	0	3	0	1	0	0	0	4	4
16:45	0	0	0	0	0	0	0	0	0	0	0	0	4	0	2	1	0	0	7	7.5	0	0	6	0	1	0	0	0	7	7
H/TOT	0	0	0	0	0	0	0	0	0	0	0	1	19	1	5	1	0	0	27	26.9	0	0	22	0	9	0	1	0	32	33.3
17:00	0	0	0	0	0	0	0	0	0	0	0	1	13	0	0	0	0	0	14	13.4	0	0	10	0	1	0	0	0	11	11
17:15	0	0	0	0	0	0	0	0	0	0	0	0	4	1	1	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	8	0	2	0	0	0	10	10	0	0	6	0	0	0	0	0	6	6
17:45	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	3	3	0	0	5	1	0	0	0	0	6	6
H/TOT	0	0	0	0	0	0	0	0	0	0	0	1	27	1	4	0	0	0	33	32.4	0	0	21	1	1	0	0	0	23	23
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	1	0	0	0	6	6
18:15	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2	1	0	4	1	0	0	0	0	6	5.2
18:30	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	0	4	4	0	0	2	0	0	0	0	0	2	2
18:45	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	3	3	0	0	3	0	0	0	0	0	3	3
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	6	0	3	0	0	0	9	9	1	0	13	2	1	0	0	0	17	16.2
12 TOT	0	0	0	0	1	0	0	0	1	1	1	5	270	7	47	6	0	0	336	335.2	5	3	219	8	53	7	1	0	296	295

B => A										B => B										B => C									
P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU
0	1	34	1	2	1	0	5	44	48.9	0	0	0	0	0	0	0	0	0	0	0	0	22	1	8	1	2	0	34	37.1
1	0	43	1	9	3	0	3	60	63.7	0	0	0	0	0	0	0	0	0	0	2	0	26	0	10	1	0	0	39	37.9
1	0	74	1	7	3	0	5	91	96.7	0	0	0	0	0	0	0	0	0	0	0	0	28	0	12	1	2	0	43	46.1
1	0	126	2	15	1	1	5	151	157	0	0	0	0	0	0	0	0	0	0	0	0	41	0	10	1	0	0	52	52.5
3	1	277	5	33	8	1	10	346	366.3	0	0	0	0	0	0	0	0	0	0	2	0	117	1	40	4	4	0	168	173.6
2	0	133	2	10	5	0	4	156	160.9	0	0	0	0	0	0	0	0	0	0	1	0	49	1	5	5	1	0	62	65
2	0	95	3	10	0	0	3	113	114.4	0	0	0	0	0	0	0	0	0	0	1	0	58	0	10	3	0	0	72	72.7
0	1	93	4	8	3	0	3	112	115.9	0	0	0	0	0	0	0	0	0	0	2	1	64	2	9	3	1	0	82	82.6
2	0	81	4	8	3	0	2	100	101.9	0	0	0	0	0	0	0	0	0	0	1	1	54	1	9	0	3	0	69	71.5
8	1	402	13	36	11	0	12	481	493.1	0	0	0	0	0	0	0	0	0	0	5	2	225	4	33	11	5	0	285	291.8
3	0	65	5	14	4	0	3	94	96.6	0	0	0	0	0	0	0	0	0	0	1	0	50	1	16	2	1	0	71	72.5
1	1	73	7	15	4	0	3	104	107.6	0	0	0	0	0	0	0	0	0	0	2	0	31	4	8	4	2	0	51	54
0	1	74	2	13	3	0	2	95	97.9	0	0	0	0	0	0	0	0	0	0	0	0	25	1	16	5	0	0	47	49.5
2	1	68	3	10	2	2	2	90	93.4	0	0	0	0	0	0	0	0	0	0	0	0	44	1	13	3	1	0	62	64.8
6	3	280	17	52	13	2	10	383	395.5	0	0	0	0	0	0	0	0	0	0	3	0	150	7	53	14	4	0	231	240.8
0	0	60	2	16	1	0	1	80	81.5	0	0	0	0	0	0	0	0	0	0	1	0	24	1	13	1	0	0	40	39.7
1	0	75	3	14	2	0	2	97	99.2	0	0	0	0	0	0	0	0	0	0	1	0	31	1	8	2	3	0	46	50.1
1	1	71	9	13	4	1	2	102	105.9	0	0	0	0	0	0	0	0	0	0	0	0	33	0	12	4	1	0	50	53.3
0	1	99	5	12	7	1	2	127	133.2	0	0	0	0	0	0	0	0	0	0	0	0	34	0	15	0	1	0	50	51.3
2	2	305	19	55	14	2	7	406	419.8	0	0	0	0	0	0	0	0	0	0	2	0	122	2	48	7	5	0	186	194.4
0	2	93	3	10	3	1	1	113	115.6	0	0	0	0	0	0	0	0	0	0	0	2	35	0	12	4	2	0	55	58.4
0	2	90	7	15	2	0	1	117	117.8	0	0	0	0	0	0	0	0	0	0	1	0	33	2	7	3	0	0	46	46.7
0	1	80	3	10	2	0	2	98	100.4	0	0	0	0	0	0	0	0	0	0	1	1	34	0	12	2	1	0	51	51.9
1	0	96	3	13	3	0	2	118	120.7	0	0	0	0	0	0	0	0	0	0	0	1	35	1	19	2	1	0	59	60.7
1	5	359	16	48	10	1	6	446	454.5	0	0	0	0	0	0	0	0	0	0	2	4	137	3	50	11	4	0	211	217.7
1	1	88	5	13	2	0	1	111	111.6	0	0	0	0	0	0	0	0	0	0	2	1	38	0	9	5	0	0	55	55.3
2	1	103	4	14	5	0	1	130	131.3	0	0	0	0	0	0	0	0	0	0	1	1	25	1	9	5	1	0	43	45.4
2	0	95	2	14	4	0	1	118	119.4	0	0	0	0	0	0	0	0	0	0	0	0	26	2	10	5	0	0	43	45.5
0	2	107	7	8	4	1	2	131	135.1	0	0	0	0	0	0	0	0	0	0	1	0	35	0	13	6	2	0	57	61.8
5	4	393	18	49	13	1	5	490	497.4	0	0	0	0	0	0	0	0	0	0	4	2	124	3	41	21	3	0	198	208
1	1	130	3	11	5	1	2	154	158.4	0	0	0	0	0	0	0	0	0	0	2	2	37	5	12	0	1	0	59	57.5
3	6	117	4	13	7	0	1	151	149.5	0	0	0	0	0	0	0	0	0	0	1	0	32	2	9	1	0	0	45	44.7
0	1	105	2	10	1	0	1	120	120.9	0	0	0	0	0	0	0	0	0	0	0	1	32	3	12	2	1	0	51	52.7
0	1	90	1	9	0	1	2	104	106.7	0	0	0	0	0	0	0	0	0	0	0	0	28	3	12	1	2	0	46	49.1
4	9	442	10	43	13	2	6	529	535.5	0	0	0	0	0	0	0	0	0	0	3	3	129	13	45	4	4	0	201	204
1	2	98	2	11	5	0	1	120	121.5	0	0	1	0	0	0	0	0	1	1	0	0	28	2	11	1	0	0	42	42.5
0	0	96	5	14	0	1	3	119	123.3	0	0	0	0	0	0	0	0	0	0	0	0	29	3	7	0	1	0	40	41.3
1	1	98	3	12	5	1	1	122	125.4	0	0	1	0	0	0	0	0	1	1	0	0	24	5	8	2	0	0	39	40
0	1	112	4	19	2	0	2	140	142.4	0	0	0	0	0	0	0	0	0	0	0	0	21	2	5	1	0	0	29	29.5
2	4	404	14	56	12	2	7	501	512.6	0	0	2	0	0	0	0	0	2	2	0	0	102	12	31	4	1	0	150	153.3
0	1	115	3	10	2	2	2	135	140	0	0	0	0	0	0	0	0	0	0	1	1	32	1	8	1	1	0	45	45.4
1	2	99	8	17	2	1	2	132	134.3	0	0	0	0	0	0	0	0	0	0	0	0	26	1	13	2	0	0	42	43
2	1	97	3	15	2	0	2	122	122.8	0	0	0	0	0	0	0	0	0	0	0	0	32	6	9	5	0	0	52	54.5
1	0	108	5	19	3	0	5	141	146.7	0	0	0	0	0	0	0	0	0	0	1	0	30	0	11	3	0	0	45	45.7
4	4	419	19	61	9	3	11	530	543.8	0	0	0	0	0	0	0	0	0	0	2	1	120	8	41	11	1	0	184	188.6
1	1	139	1	16	0	0	3	161	162.6	0	0	0	0	0	0	0	0	0	0	0	0	38	2	6	0	0	0	46	46
3	0	100	4	11	1	0	2	121	121.1	0	0	0	0	0	0	0	0	0	0	1	1	27	2	3	0	0	0	34	32.6
5	2	117	2	7	0	0	4	137	135.8	0	0	0	0	0	0	0	0	0	0	0	1	25	1	2	1	0	0	30	29.9
1	1	109	1	6	1	1	2	122	124.4	0	0	0	0	0	0	0	0	0	0	0	0	40	3	2	1	0	0	46	46.5
10	4	465	8	40	2	1	11	541	543.9	0	0	0	0	0	0	0	0	0	0	1	2	130	8	13	2	0	0	156	155
4	0	148	3	9	0	0	6	170	172.8	0	0	0	0	0	0	0	0	0	0	1	0	36	1	0	0	0	0	38	37.2
0	0	131	2	7	2	0	2	144	147	0	0	0	0	0	0	0	0	0	0	1	0	25	1	1	0	0	0	28	27.2
1	0	127	4	5	2	0	3	142	145.2	0	0	0	0	0	0	0	0	0	0	0	0	30	2	2	0	0	0	34	34
3	2	109	2	4	2	0	0	122	119.4	0	0	0	0	0	0	0	0	0	0	1	0	24	2	1	1	0	0	29	28.7
8	2	515	11	25	6	0	11	578	584.4	0	0	0	0	0	0	0	0	0	0	3	0	115	6	4	1	0	0	129	127.1
0	0	88	1	4	0	0	7	100	107	0	0	0	0	0	0	0	0	0	0	0	0	22	3	3	0	0	0	28	28
2	3	84	1	6	0	0	3	99	98.6	0	0	0	0	0	0	0	0	0	0	1	0	24	0	0	0	0	0	25	24.2
2	1	78	0	0	0	0	4	85	86.8	0	0	0	0	0	0	0	0	0	0	0	0	23	0	1	0	1	0	25	26.3
0	0	71	6	2	0	0	3	82	85	0	0	0	0	0	0	0	0	0	0	2	0	25	2	1	0	0	0	30	28.4
4	4	321	8	12	0	0	17	366	377.4	0	0	0	0	0	0	0	0	0	0	3	0	94	5	5	0	1	0	108	106.9
55	43	4582	158	510	113	15	121	5597	5724.2	0	0	2	0	0	0	0	0	2	2	30	14	1565	72	404	90	32	0	2207	2261.2

C => A										C => B										C => C									
P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU
0	0	6	1	1	0	0	0	8	8	0	0	1	0	1	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
0	0	7	0	3	0	0	0	10	10	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
0	0	10	2	6	0	0	0	18	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	17	1	6	0	0	0	24	24	0	0	0	0	2	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
0	0	40	4	16	0	0	0	60	60	0	0	2	0	3	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0
0	0	16	1	8	5	0	0	30	32.5	0	0	1	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	1	1
0	0	21	1	10	0	0	0	32	32	0	0	1	0	1	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
0	0	22	0	4	2	0	0	28	29	1	0	1	0	0	0	0	0	2	1.2	0	0	0	0	0	0	0	0	0	0
0	0	17	1	1	2	1	0	22	24.3	1	0	0	0	0	0	0	0	1	0.2	0	0	0	0	0	0	0	0	0	0
0	0	76	3	23	9	1	0	112	117.8	2	0	3	0	1	0	0	0	6	4.4	0	0	1	0	0	0	0	0	1	1
0	0	15	1	7	0	0	0	23	23	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
0	0	20	2	6	0	0	0	28	28	0	0	4	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0
0	0	17	1	5	2	0	0	25	26	0	0	5	1	3	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0
0	0	25	2	18	2	1	0	48	50.3	0	0	2	0	1	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0
0	0	77	6	36	4	1	0	124	127.3	0	0	13	1	4	0	0	0	18	18	0	0	0	0	0	0	0	0	0	0
0	1	8	0	6	5	1	0	21	24.2	0	0	1	0	1	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
0	1	20	0	13	3	0	0	37	37.9	0	0	2	0	1	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0
0	0	16	2	8	5	0	0	31	33.5	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
0	0	19	0	9	2	0	0	30	31	0	0	1	0	2	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0
0	2	63	2	36	13	1	0	119	126.6	0	0	5	0	4	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0
0	2	25	2	14	2	0	0	45	44.8	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
0	1	25	1	6	1	1	0	35	36.2	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
0	1	23	3	8	3	0	0	38	38.9	0	0	0	0	2	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
0	1	24	2	10	4	0	0	41	42.4	1	0	4	0	0	0	0	0	5	4.2	0	0	0	0	0	0	0	0	0	0
0	5	97	8	38	10	1	0	159	162.3	1	0	4	0	4	0	0	0	9	8.2	0	0	0	0	0	0	0	0	0	0
0	0	22	2	7	0	0	0	31	31	1	0	2	0	0	0	0	0	3	2.2	0	0	0	0	0	0	0	0	0	0
0	1	31	1	8	4	0	0	35	36.4	0	0	1	0	1	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
0	1	32	2	13	3	0	0	51	51.9	0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0
0	0	26	2	13	3	0	0	44	45.5	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
0	2	101	7	41	10	0	0	161	164.8	1	0	8	0	1	0	0	0	10	9.2	0	0	0	0	0	0	0	0	0	0
0	1	29	0	13	1	1	0	45	46.2	1	0	4	0	1	0	0	0	6	5.2	0	0	0	0	0	0	0	0	0	0
0	2	42	3	9	3	0	0	59	59.3	3	0	1	0	1	0	0	0	5	2.6	0	0	0	0	0	0	0	0	0	0
0	0	29	1	13	2	1	0	46	48.3	0	0	3	0	1	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0
0	2	38	1	13	1	0	0	55	54.3	0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0
0	5	138	5	48	7	2	0	205	208.1	4	0	11	0	3	0	0	0	18	14.8	0	0	0	0	0	0	0	0	0	0
0	0	31	2	7	0	1	0	41	42.3	0	0	0	0	0	1	0	0	1	1.5	0	0	0	0	0	0	0	0	0	0
0	1	32	4	4	1	0	0	42	41.9	0	0	3	1	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0
0	2	25	1	12	1	0	0	41	40.3	1	0	0	0	1	0	0	0	2	1.2	0	0	0	0	0	0	0	0	0	0
1	1	34	7	9	4	0	0	56	56.6	0	0	1	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	1	1
1	4	122	14	32	6	1	0	180	181.1	1	0	4	1	1	1	0	0	8	7.7	0	0	1	0	0	0	0	0	1	1
0	0	21	5	5	1	0	0	32	32.5	1	0	1	0	1	0	0	0	3	2.2	0	0	0	0	0	0	0	0	0	0
0	0	23	3	17	0	0	0	43	43	0	0	3	0	1	0	1	0	5	6.3	0	0	0	0	0	0	0	0	0	0
0	0	37	3	17	1	0	0	58	58.5	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
0	0	30	1	8	0	0	0	39	39	1	0	2	0	0	0	0	0	3	2.2	0	0	0	0	0	0	0	0	0	0
0	0	111	12	47	2	0	0	172	173	2	0	7	0	2	0	1	0	12	11.7	0	0	0	0	0	0	0	0	0	0
1	1	43	1	9	6	0	0	61	62.6	1	0	2	0	2	0	0	0	5	4.2	0	0	0	0	0	0	0	0	0	0
0	0	47	2	5	1	0	0	55	55.5	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
1	1	48	2	9	1	0	0	62	61.1	1	0	1	0	0	0	0	0	2	1.2	0	0	0	0	0	0	0	0	0	0
0	0	38	0	9	1	0	0	48	48.5	1	0	2	1	2	0	0	0	6	5.2	0	0	0	0	0	0	0	0	0	0
2	2	176	5	32	9	0	0	226	227.7	3	0	6	1	4	0	0	0	14	11.6	0	0	0	0	0	0	0	0	0	0
0	0	48	1	4	1	0	0	54	54.5	1	0	0	1	0	0	0	0	2	1.2	0	0	0	0	0	0	0	0	0	0
0	1	47	2	6	0	0	0	56	55.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	1	45	1	0	0	0	0	47	46.4	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
0	1	38	2	3	0	0	0	44	43.4	2	0	0	0	0	0	0	0	2	0.4	0	0	0	0	0	0	0	0	0	0
0	3	178	6	13	1	0	0	201	199.7	3	0	2	1	0	0	0	0	6	3.6	0	0	0	0	0	0	0	0	0	0
0	1	33	0	2	0	0	0	36	35.4	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
0	0	35	3	2	0	0	0	40	40	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
0	0	24	1	1	0	0	0	26	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	26	1	2	0	1	0	30	31.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	1	118	5	7	0	1	0	132	132.7	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
3	24	1297	77	369	73	8	0	1851	1881.1	17	0	67	4	27	1	1	0	117	105.2	0	0	2	0	0	0	0	0	2	2

IDASO

Survey Name: 012 21459 Avid & TAC Packaging Site - Traffic Surveys
Site: Site 2
Location: Carmanhall Road/Ravens Rock Road
Date: Tue 11-Jan-2022

	A => A										A => B										A => C									
TIME	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0	0	0	7	2	3	1	3	0	16	20.4	0	0	6	0	5	0	0	0	11	11
07:15	0	0	0	0	0	0	0	0	0	0	2	0	10	0	5	1	0	0	18	16.9	0	0	11	0	4	0	0	0	15	15
07:30	0	0	0	0	0	0	0	0	0	0	0	0	13	0	4	1	1	0	19	20.8	1	0	9	0	6	0	0	0	16	15.2
07:45	0	0	0	0	0	0	0	0	0	0	0	0	25	0	2	0	0	0	27	27	1	0	19	0	4	1	0	0	25	24.7
H/TOT	0	0	0	0	0	0	0	0	0	0	2	0	55	2	14	3	4	0	80	85.1	2	0	45	0	19	1	0	0	67	65.9
08:00	0	0	1	0	0	0	0	0	1	1	1	0	33	0	1	2	1	0	38	39.5	0	0	10	0	2	3	0	0	15	16.5
08:15	0	0	0	0	0	0	0	0	0	0	2	0	40	1	6	0	0	0	49	47.4	0	0	14	0	2	1	0	0	17	17.5
08:30	0	0	0	0	0	0	0	0	0	0	2	0	43	2	8	3	1	0	59	60.2	0	0	9	0	2	1	0	0	12	12.5
08:45	0	0	0	0	0	0	0	0	0	0	0	0	40	2	4	1	3	0	50	54.4	1	0	11	0	3	1	0	0	16	15.7
H/TOT	0	0	1	0	0	0	0	0	1	1	5	0	156	5	19	6	5	0	196	201.5	1	0	44	0	9	6	0	0	60	62.2
09:00	0	0	0	0	0	0	0	0	0	0	1	0	39	1	9	0	1	0	51	51.5	1	0	11	0	7	2	0	0	21	21.2
09:15	0	0	0	0	0	0	0	0	0	0	1	0	22	2	5	2	2	0	34	36.8	0	0	11	1	2	1	0	0	15	15.5
09:30	0	0	0	0	0	0	0	0	0	0	0	0	23	2	5	5	1	0	36	39.8	0	0	11	0	11	3	0	0	25	26.5
09:45	0	0	0	0	0	0	0	0	0	0	1	0	26	1	8	6	0	0	42	44.2	0	0	8	0	7	1	1	0	17	18.8
H/TOT	0	0	0	0	0	0	0	0	0	0	3	0	110	6	27	13	4	0	163	172.3	1	0	41	1	27	7	1	0	78	82
10:00	0	0	0	0	0	0	0	0	0	0	0	0	18	1	6	1	1	0	27	28.8	0	0	5	0	8	1	0	0	14	14.5
10:15	0	0	0	0	0	0	0	0	0	0	1	0	24	1	4	1	2	0	33	35.3	1	0	11	0	2	1	1	0	16	17
10:30	0	0	0	0	0	0	0	0	0	0	0	0	25	0	7	1	1	0	34	35.8	0	0	7	0	6	2	0	0	15	16
10:45	0	0	0	0	0	0	0	0	0	0	0	0	26	0	7	1	1	0	35	36.8	0	0	6	0	7	0	0	0	13	13
H/TOT	0	0	0	0	0	0	0	0	0	0	1	0	93	2	24	4	5	0	129	136.7	1	0	29	0	23	4	1	0	58	60.5
11:00	0	0	0	0	0	0	0	0	0	0	0	2	22	0	7	1	4	0	36	40.5	0	0	12	0	4	2	0	0	18	19
11:15	0	0	1	0	0	0	0	0	1	1	1	0	25	2	4	3	0	0	35	35.7	0	0	6	0	3	0	0	0	9	9
11:30	0	0	0	0	0	0	0	0	0	0	1	0	28	0	10	1	1	0	41	42	0	0	9	0	5	2	0	0	16	17
11:45	0	0	0	0	0	0	0	0	0	0	0	1	22	1	7	1	1	0	33	34.2	0	0	17	0	10	1	0	0	28	28.5
H/TOT	0	0	1	0	0	0	0	0	1	1	2	3	97	3	28	6	6	0	145	152.4	0	0	44	0	22	5	0	0	71	73.5
12:00	0	0	0	0	0	0	0	0	0	0	1	1	34	1	8	3	0	0	48	48.1	0	0	9	0	3	1	0	0	13	13.5
12:15	0	0	0	0	0	0	0	0	0	0	1	1	18	1	4	2	0	0	27	26.6	0	0	9	0	5	3	1	0	18	20.8
12:30	0	0	0	0	0	0	0	0	0	0	0	1	26	2	7	3	0	0	39	39.9	0	0	10	0	3	2	0	0	15	16
12:45	0	0	0	0	0	0	0	0	0	0	1	0	28	1	9	5	1	0	45	48	0	0	13	0	7	3	1	0	24	26.8
H/TOT	0	0	0	0	0	0	0	0	0	0	3	3	106	5	28	13	1	0	159	162.6	0	0	41	0	18	9	2	0	70	77.1
13:00	0	0	0	0	0	0	0	0	0	0	3	2	32	5	6	0	0	0	48	44.4	0	0	9	0	3	0	0	0	12	12
13:15	0	0	0	0	0	0	0	0	0	0	1	0	27	2	6	0	1	0	37	37.5	0	0	3	0	4	0	0	0	7	7
13:30	0	0	0	0	0	0	0	0	0	0	0	1	24	2	8	1	1	0	37	38.2	0	0	16	0	5	0	0	0	21	21
13:45	0	0	0	0	0	0	0	0	0	0	0	0	22	2	6	1	2	0	33	36.1	0	0	8	0	6	0	0	0	14	14
H/TOT	0	0	0	0	0	0	0	0	0	0	4	3	105	11	26	2	4	0	155	156.2	0	0	36	0	18	0	0	0	54	54
14:00	0	0	0	0	0	0	0	0	0	0	0	0	29	2	5	0	1	0	37	38.3	0	0	8	0	5	1	0	0	14	14.5
14:15	0	0	0	0	0	0	0	0	0	0	0	0	27	2	2	0	1	0	32	33.3	0	0	10	1	4	0	0	0	15	15
14:30	0	0	0	0	0	0	0	0	0	0	0	0	24	5	7	2	0	0	38	39	0	0	3	0	1	0	0	0	4	4
14:45	0	0	0	0	0	0	0	0	0	0	0	0	17	3	2	1	0	0	23	23.5	0	0	11	1	3	1	0	0	16	16.5
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	97	12	16	3	2	0	130	134.1	0	0	32	2	13	2	0	0	49	50
15:00	0	0	0	0	0	0	0	0	0	0	0	1	27	2	4	0	2	0	36	38	0	0	13	0	5	0	0	0	18	18
15:15	0	0	0	0	0	0	0	0	0	0	1	0	25	1	9	1	0	0	37	36.7	0	0	9	0	4	1	0	0	14	14.5
15:30	0	0	0	0	0	0	0	0	0	0	0	0	40	6	4	2	0	0	52	53	0	0	5	0	7	3	0	0	15	16.5
15:45	0	0	0	0	0	0	0	0	0	0	0	0	27	1	4	1	0	0	33	33.5	0	0	7	0	7	1	0	0	15	15.5
H/TOT	0	0	0	0	0	0	0	0	0	0	1	1	119	10	21	4	2	0	158	161.2	0	0	34	0	23	5	0	0	62	64.5
16:00	0	0	0	0	0	0	0	0	0	0	0	0	37	1	3	0	0	0	41	41	0	0	7	0	4	0	0	0	11	11
16:15	0	0	0	0	0	0	0	0	0	0	0	1	25	1	2	0	1	0	30	30.7	0	0	6	0	5	0	0	0	11	11
16:30	0	0	0	0	0	0	0	0	0	0	1	1	19	1	3	0	0	0	25	23.6	0	0	7	0	2	1	0	0	10	10.5
16:45	0	0	0	0	0	0	0	0	0	0	0	0	34	2	2	0	0	0	38	38	0	0	8	1	3	1	0	0	13	13.5
H/TOT	0	0	0	0	0	0	0	0	0	0	1	2	115	5	10	0	1	0	134	133.3	0	0	28	1	14	2	0	0	45	46
17:00	0	0	0	0	0	0	0	0	0	0	1	0	44	0	1	0	0	0	46	45.2	0	0	5	0	0	0	0	0	5	5
17:15	0	0	0	0	0	0	0	0	0	0	0	0	22	1	0	0	0	0	23	23	0	0	3	0	0	0	0	0	3	3
17:30	0	0	0	0	0	0	0	0	0	0	0	2	25	1	1	0	0	0	29	27.8	0	0	0	0	2	0	0	0	2	2
17:45	0	0	0	0	0	0	0	0	0	0	0	1	18	1	2	1	0	0	23	22.9	0	0	3	0	0	0	0	0	3	3
H/TOT	0	0	0	0	0	0	0	0	0	0	1	3	109	3	4	1	0	0	121	118.9	0	0	11	0	2	0	0	0	13	13
18:00	0	0	0	0	0	0	0	0	0	0	1	0	22	0	2	0	0	0	25	24.2	0	0	0	0	1	0	0	0	1	1
18:15	0	0	0	0	0	0	0	0	0	0	1	0	23	1	0	0	0	0	25	24.2	1	0	4	0	0	0	0	0	5	4.2
18:30	0	0	0	0	0	0	0	0	0	0	2	0	25	0	1	0	0	0	28	26.4	1	0	2	0	0	0	1	0	4	4.5
18:45	0	0	0	0	0	0	0	0	0	0	1	0	19	2	1	0	0	0	23	22.2	0	0	2	0	1	0	0	0	3	3
H/TOT	0	0	0	0	0	0	0	0	0	0	5	0	89	3	4	0	0	0	101	97	2	0	8	0	2	0	1	0	13	12.7
12 TOT	0	0	2	0	0	0	0	0	2	2	28	15	1251	67	221	55	34	0	1671	1711.3	7	0	393	4	190	41	5	0	640	661.4

B => A										B => B										B => C									
P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU
0	0	9	1	7	0	0	0	17	17	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	3	3.5
0	0	9	0	0	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
0	0	10	2	2	0	0	0	14	14	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2	2
0	0	12	2	1	0	0	0	15	15	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	3	2.2
0	0	40	5	10	0	0	0	55	55	0	0	0	0	0	0	0	0	0	0	1	0	5	0	2	1	0	0	9	8.7
0	0	18	1	0	2	0	0	21	22	0	0	0	0	0	0	0	0	0	0	0	0	3	0	2	0	0	0	5	5
0	0	20	0	5	0	0	0	25	25	0	0	0	0	0	0	0	0	0	0	0	0	5	0	1	0	0	0	6	6
1	0	23	0	5	1	0	0	30	29.7	0	0	0	0	0	0	0	0	0	0	0	0	5	0	1	0	0	0	6	6
2	1	16	0	3	1	0	0	23	21.3	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	0	4	4
3	1	77	1	13	4	0	0	99	98	0	0	0	0	0	0	0	0	0	0	0	0	16	0	5	0	0	0	21	21
0	0	13	1	5	0	0	0	19	19	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3	1	0	0	5	5.5
0	0	18	1	2	1	2	0	24	27.1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	3	3
1	0	18	1	4	1	0	0	25	24.7	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	3	3.5
0	0	15	0	6	3	2	0	26	30.1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	1	0	0	5	5.5
1	0	64	3	17	5	4	0	94	100.9	0	0	0	0	0	0	0	0	0	0	0	0	6	0	7	3	0	0	16	17.5
0	1	8	0	1	4	2	0	16	20	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3	1	0	0	5	5.5
0	1	16	0	5	4	0	0	26	27.4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	4	1	0	0	6	6.5
0	0	11	1	2	1	0	0	15	15.5	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	0	4	4
1	0	9	1	9	1	0	0	21	20.7	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	1	0	0	7	7.5
1	2	44	2	17	10	2	0	78	83.6	0	0	0	0	0	0	0	0	0	0	0	0	8	0	11	3	0	0	22	23.5
1	2	13	2	7	2	0	0	27	26	0	0	0	0	0	0	0	0	0	0	0	0	4	0	3	0	0	0	7	7
0	0	16	0	2	0	1	0	19	20.3	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	1	0	0	5	4.7
0	1	15	1	2	2	0	0	21	21.4	0	0	0	0	0	0	0	0	0	0	0	0	3	0	2	0	1	0	6	7.3
1	1	14	1	4	2	0	0	23	22.6	0	0	0	0	0	0	0	0	0	0	0	0	4	0	2	0	0	0	6	6
2	4	58	4	15	6	1	0	90	90.3	0	0	0	0	0	0	0	0	0	0	1	0	12	0	9	1	1	0	24	25
1	0	13	1	2	0	0	0	17	16.2	0	0	0	0	0	0	0	0	0	0	0	0	4	0	6	0	0	0	10	10
0	1	22	0	5	0	0	0	28	27.4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	0	0	4	5
0	1	20	2	8	3	0	0	34	34.9	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	4	4
0	0	16	1	4	1	0	0	22	22.5	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	1	0	0	5	5.5
1	2	71	4	19	4	0	0	101	101	0	0	0	0	0	0	0	0	0	0	0	0	11	0	9	3	0	0	23	24.5
1	1	17	1	9	0	1	0	30	29.9	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	6	6
2	2	26	2	4	3	0	0	39	37.7	0	0	0	0	0	0	0	0	0	0	0	0	4	0	3	0	0	0	7	7
0	1	27	1	6	1	1	0	37	38.2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	4	0	0	0	6	6
0	2	27	1	7	1	0	0	38	37.3	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	0	0	0	4	4
3	6	97	5	26	5	2	0	144	143.1	0	0	0	0	0	0	0	0	0	0	0	0	11	1	11	0	0	0	23	23
0	0	20	2	2	0	1	0	25	26.3	0	0	0	0	0	0	0	0	0	0	0	0	3	0	2	1	0	0	6	6.5
0	0	25	3	0	0	0	0	28	28	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	1	0	0	5	5.5
0	2	17	2	1	1	0	0	23	22.3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	0	0	4	5
1	1	23	5	5	2	0	0	37	36.6	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	3	3
1	3	85	12	8	3	1	0	113	113.2	0	0	0	0	0	0	0	0	0	0	0	0	9	1	4	4	0	0	18	20
0	1	16	4	0	1	0	0	22	21.9	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2	2
0	0	16	2	6	0	1	0	25	26.3	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	0	4	5.8
0	0	18	3	3	0	0	0	24	24	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	4	4
1	0	25	1	4	0	0	0	31	30.2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
1	1	75	10	13	1	1	0	102	102.4	0	0	0	0	0	0	0	0	0	0	0	0	7	1	1	1	1	0	11	12.8
1	0	22	2	1	0	0	0	26	25.2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2	2
0	0	23	1	3	0	0	0	27	27	0	0	0	0	0	0	0	0	0	0	0	0	2	0	4	0	0	0	6	6
2	1	36	0	4	1	0	0	44	42.3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2	2
1	0	28	0	2	0	0	0	31	30.2	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	0	4	4
4	1	109	3	10	1	0	0	128	124.7	0	0	0	0	0	0	0	0	0	0	0	0	7	0	7	0	0	0	14	14
1	1	31	2	1	1	0	0	37	36.1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2	2
0	0	29	0	3	0	0	0	32	32	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
0	0	30	1	2	0	0	0	33	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	1	27	0	1	0	0	0	31	28.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	2	117	3	7	1	0	0	133	129.9	0	0	1	0	0	0	0	0	1	1	0	0	1	0	1	0	0	0	2	2
1	1	23	0	0	0	0	0	25	23.6	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
1	0	24	2	1	0	0	0	28	27.2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
3	0	12	0	0	0	0	0	15	12.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	22	0	3	0	0	0	25	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	1	81	2	4	0	0	0	93	88.4	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2
25	23	918	54	159	40	11	0	1230	1230.5	0	0	1	0	0	0	0	0	1	1	2	0	95	3	67	16	2	0	185	194

C => A										C => B										C => C									
P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU
0	0	3	0	0	0	0	0	3	3	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
0	0	2	0	2	0	0	0	4	4	0	0	2	0	3	3	0	0	8	9.5	0	0	0	0	0	0	0	0	0	0
0	0	3	0	6	0	0	0	9	9	0	0	1	1	0	1	0	0	3	3.5	0	0	0	0	0	0	0	0	0	0
1	0	3	0	3	0	0	0	7	6.2	0	0	2	0	1	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0
1	0	11	0	11	0	0	0	23	22.2	0	0	6	1	4	4	0	0	15	17	0	0	0	0	0	0	0	0	0	0
0	0	2	0	6	3	0	0	11	12.5	0	0	0	0	0	2	0	0	2	3	0	0	0	0	0	0	0	0	0	0
0	0	2	0	4	0	0	0	6	6	0	0	3	1	1	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0
0	0	2	0	1	1	0	0	4	4.5	0	0	2	0	3	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0
0	0	4	1	0	1	0	0	6	6.5	0	0	1	0	2	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0
0	0	10	1	11	5	0	0	27	29.5	0	0	6	1	6	2	0	0	15	16	0	0	0	0	0	0	0	0	0	0
0	0	4	1	2	0	0	0	7	7	0	0	2	0	0	1	0	0	3	3.5	0	0	0	0	0	0	0	0	0	0
0	0	10	0	5	0	0	0	15	15	0	0	0	0	2	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
0	0	6	0	5	1	0	0	12	12.5	0	0	1	0	6	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0
1	0	4	2	7	2	0	0	16	16.2	0	0	7	1	1	2	0	0	11	12	0	0	0	0	0	0	0	0	0	0
1	0	24	3	19	3	0	0	50	50.7	0	0	10	1	9	3	0	0	23	24.5	0	0	0	0	0	0	0	0	0	0
1	0	3	0	6	1	0	0	11	10.7	0	0	0	0	1	1	0	0	2	2.5	0	0	0	0	0	0	0	0	0	0
0	0	8	0	6	1	0	0	15	15.5	0	0	2	0	3	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0
0	0	4	1	6	2	0	0	13	14	0	0	2	0	6	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0
0	0	4	0	3	1	0	0	8	8.5	0	0	3	0	2	2	0	0	7	8	0	0	0	0	0	0	0	0	0	0
1	0	19	1	21	5	0	0	47	48.7	0	0	7	0	12	3	0	0	22	23.5	0	0	0	0	0	0	0	0	0	0
0	0	8	0	9	0	0	0	17	17	0	0	5	0	1	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0
0	1	8	0	2	1	0	0	12	11.9	0	0	2	1	3	1	0	0	7	7.5	0	0	0	0	0	0	0	0	0	0
0	0	7	1	5	2	0	0	15	16	0	0	0	0	3	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0
0	0	13	0	8	0	0	0	21	21	0	0	3	0	3	0	1	0	7	8.3	0	0	0	0	0	0	0	0	0	0
0	1	36	1	24	3	0	0	65	65.9	0	0	10	1	10	1	1	0	23	24.8	0	0	0	0	0	0	0	0	0	0
0	0	8	0	5	0	0	0	13	13	0	0	2	0	4	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0
0	0	6	0	2	2	0	0	10	11	0	0	1	0	3	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0
0	0	15	0	6	2	0	0	23	24	0	0	3	0	2	1	0	0	6	6.5	0	0	0	0	0	0	0	0	0	0
0	0	11	1	4	2	0	0	18	19	0	0	5	0	4	1	0	0	10	10.5	0	0	0	0	0	0	0	0	0	0
0	0	40	1	17	6	0	0	64	67	0	0	11	0	13	2	0	0	26	27	0	0	0	0	0	0	0	0	0	0
0	0	13	0	4	1	1	0	19	20.8	0	0	3	0	1	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0
0	0	15	0	6	1	0	0	22	22.5	0	0	3	1	1	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0
0	0	8	0	5	0	0	0	13	13	0	0	4	0	4	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0
0	0	5	0	4	0	0	0	9	9	0	0	3	1	3	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0
0	0	41	0	19	2	1	0	63	65.3	0	0	13	2	9	0	0	0	24	24	0	0	0	0	0	0	0	0	0	0
0	0	13	0	5	0	0	0	18	18	0	0	1	1	1	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0
0	0	8	2	2	1	0	0	13	13.5	0	0	5	0	3	1	0	0	9	9.5	0	0	0	0	0	0	0	0	0	0
0	0	7	1	6	0	0	0	14	14	0	0	1	1	0	1	0	0	3	3.5	0	0	0	0	0	0	0	0	0	0
1	0	10	2	5	4	0	0	22	23.2	0	0	3	0	2	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0
1	0	38	5	18	5	0	0	67	68.7	0	0	10	2	6	2	0	0	20	21	0	0	0	0	0	0	0	0	0	0
1	0	10	0	3	0	0	0	14	13.2	0	0	5	0	1	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0
0	0	5	0	8	0	0	0	13	13	0	0	3	0	1	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0
0	0	11	0	5	1	0	0	17	17.5	0	0	6	0	3	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0
1	0	5	1	2	2	0	0	11	11.2	0	0	1	0	3	1	1	0	6	7.8	0	0	0	0	0	0	0	0	0	0
2	0	31	1	18	3	0	0	55	54.9	0	0	15	0	8	1	1	0	25	26.8	0	0	0	0	0	0	0	0	0	0
2	1	11	0	4	1	0	0	19	17.3	0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0
0	0	14	0	2	0	0	0	16	16	0	0	4	0	1	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0
0	0	18	0	4	1	0	0	23	23.5	0	0	4	0	1	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0
0	0	8	0	8	0	0	0	16	16	1	0	7	0	1	1	0	0	10	9.7	0	0	0	0	0	0	0	0	0	0
2	1	51	0	18	2	0	0	74	72.8	1	0	18	0	3	1	0	0	23	22.7	0	0	0	0	0	0	0	0	0	0
1	0	20	0	0	0	0	0	21	20.2	2	0	5	0	2	0	0	0	9	7.4	0	0	0	0	0	0	0	0	0	0
0	0	11	0	0	0	0	0	11	11	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
0	0	8	0	0	0	0	0	8	8	0	0	1	3	1	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0
0	0	9	1	1	0	0	0	11	11	0	0	3	1	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0
1	0	48	1	1	0	0	0	51	50.2	2	0	11	4	3	0	0	0	20	18.4	0	0	0	0	0	0	0	0	0	0
0	0	6	0	1	0	0	0	7	7	1	0	2	0	0	0	0	0	3	2.2	0	0	0	0	0	0	0	0	0	0
0	0	6	0	1	0	0	0	7	7	1	0	3	0	1	0	0	0	5	4.2	0	0	0	0	0	0	0	0	0	0
0	0	9	0	1	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	4	0	0	0	1	0	5	6.3	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
0	0	25	0	3	0	1	0	29	30.3	2	0	5	0	2	0	0	0	9	7.4	0	0	0	0	0	0	0	0	0	0
9	2	374	14	180	34	2	0	615	626.2	5	0	122	12	85	19	2	0	245	253.1	0	0	0	0	0	0	0	0	0	0

C. TRANSYT Output

D. PICADY Output

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