Public Transport Capacity Analysis

Proposed Residential Development at Knockrabo, Mount Anville Road, Goatstown, Dublin 14

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This document has been prepared and checked in accordance with
Waterman Group's IMS (BS EN ISO 9001: 2008, BS EN ISO 14001: 2004 and BS OHSAS 18001:2007)

Issue	Date	Prepared by	Checked by	Approved by
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Comments

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1. Introduction

1.1 Introduction

This Public Transport Capacity Analysis at Mount Anville has been prepared by Waterman Moylan on behalf of Knockrabo Investments DAC to accompany a planning application to Dun Laoghaire Rathdown County Council, a proposed development on lands at Knockrabo, Mount Anville Road, Goatstown, Co. Dublin.

Knockrabo Investments DAC intend to apply for permission for a Large-scale Residential Development ranging from 2- part 8 storeys (for a period of 7 years) with a total application site area of c. 2.54 hectares, at Knockrabo, Mount Anville Road, Goatstown, Dublin 14.

The development will consist of the construction of 158 No. residential units (12 No. houses and 146 No. apartments (35 No. 1 beds, 81 No. 2 beds, 3 No. 3 beds and 27 No. 3 bed duplex units), a childcare facility and Community / Leisure Uses.

The development will also provide 130 No. car parking spaces consisting of 117 No. residential spaces (comprising 54 No. at podium level, 63 No. on-street and on curtilage spaces, 6 No. visitor spaces and 2 No. on-street car sharing spaces); and 5 No. non-residential spaces; provision of 366 No. bicycle parking spaces (consisting of: 288 No. residential spaces, 70 No. (residential) visitor spaces, 6 No. (non-residential) spaces and 2 No. visitor (non-residential) spaces); and 9 No. motorcycle parking spaces.

The application does not impact on the future access to the Reservation for the Dublin Eastern Bypass.

1.2 Location

The site is located in Knockrabo, Mount Anville Road, Goatstown, Co. Dublin.

The subject site is bounded to the south-east by Mount Anville Road; to the south by 'Mount Anville Lodge' and by the rear boundaries of 'Thendara' (a Protected Structure – RPS Ref. 812), 'The Garth' (a Protected Structure – RPS Ref. 819), 'Chimes', 'Hollywood House' (a Protected Structure – RPS Ref. 829); to the south-west by existing allotments; to the north by the reservation corridor for the Dublin Eastern By-Pass (DEBP); and to the east by the site of residential development 'Knockrabo' (Phase 1, permitted under DLRCC Reg. Ref. D13A/0689 / An Bord Pleanála (ABP) Ref. PL.06D.243799 and DLRCC Reg. Ref. D16A/0821 (Phase 1); and DLRCC Reg. Ref. D16A/0960 (Phase 1A)).

The site includes 'Cedar Mount' (a Protected Structure- RPS Ref. 783) and 'Knockrabo Gate Lodge (West)' (a Protected Structure RPS Ref. 796), including Entrance Gates and Piers.

It is noted that an agreed access reservation for the DEBP project is supplied along Knockrabo Way, the entrance road to the development, as indicated in the accompanying Road Hierarchy drawing Waterman Moylan drawing No. *20-086-P105A Proposed Road Hierarchy & General Site Layout*.

The application does not impact on the future access to the Reservation for the Dublin Eastern Bypass.

Vehicular, cycle and pedestrian access to serve the development will be provided from Mount Anville Road (R112) via Knockrabo Way, which borders the Subject Development to the right.

On Mount Anville Road (R112) towards the east, 50m from the junction of Knockrabo Way and Mount Anville Road (R112) is the access to Mount Anville Junior School & Secondary School.

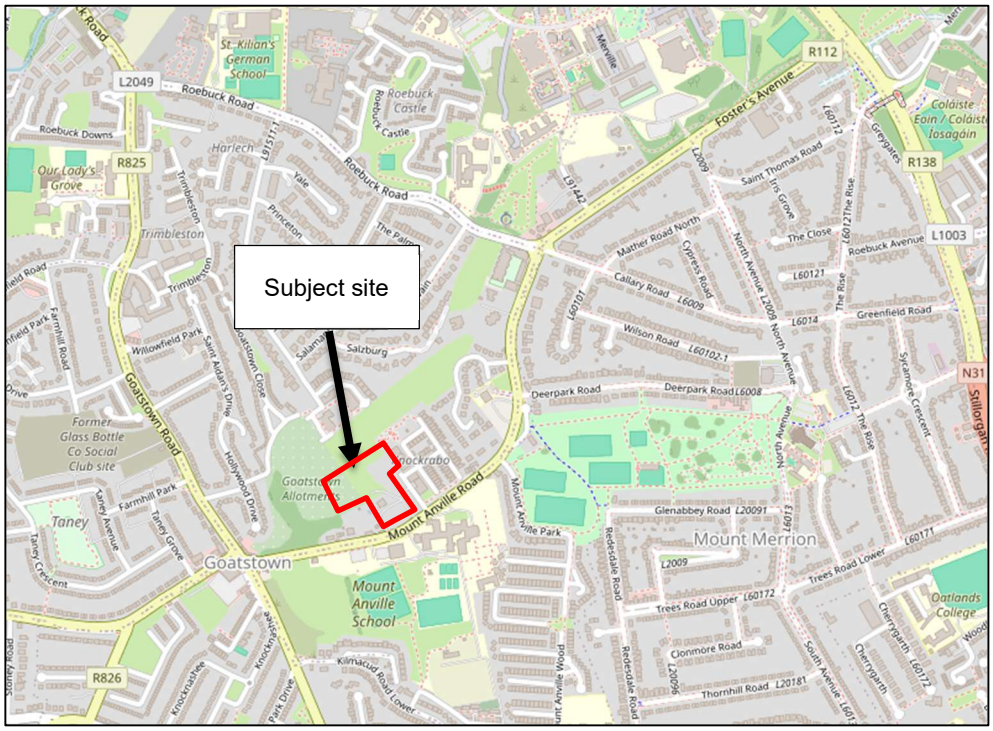

Figure 1 | Site Location

2. Bus Services

The proposed development is well served in terms of public transport provision as can be seen in **Figure 2** below, which shows the bus stops in the surrounding area of the Subject Development.

The closest bus stop is located on Mount Anville Road which serves routes S6 & 511. There are extra bus stops in the vicinity of the site on the R825 which serves route 11, within 500 metres of the site.

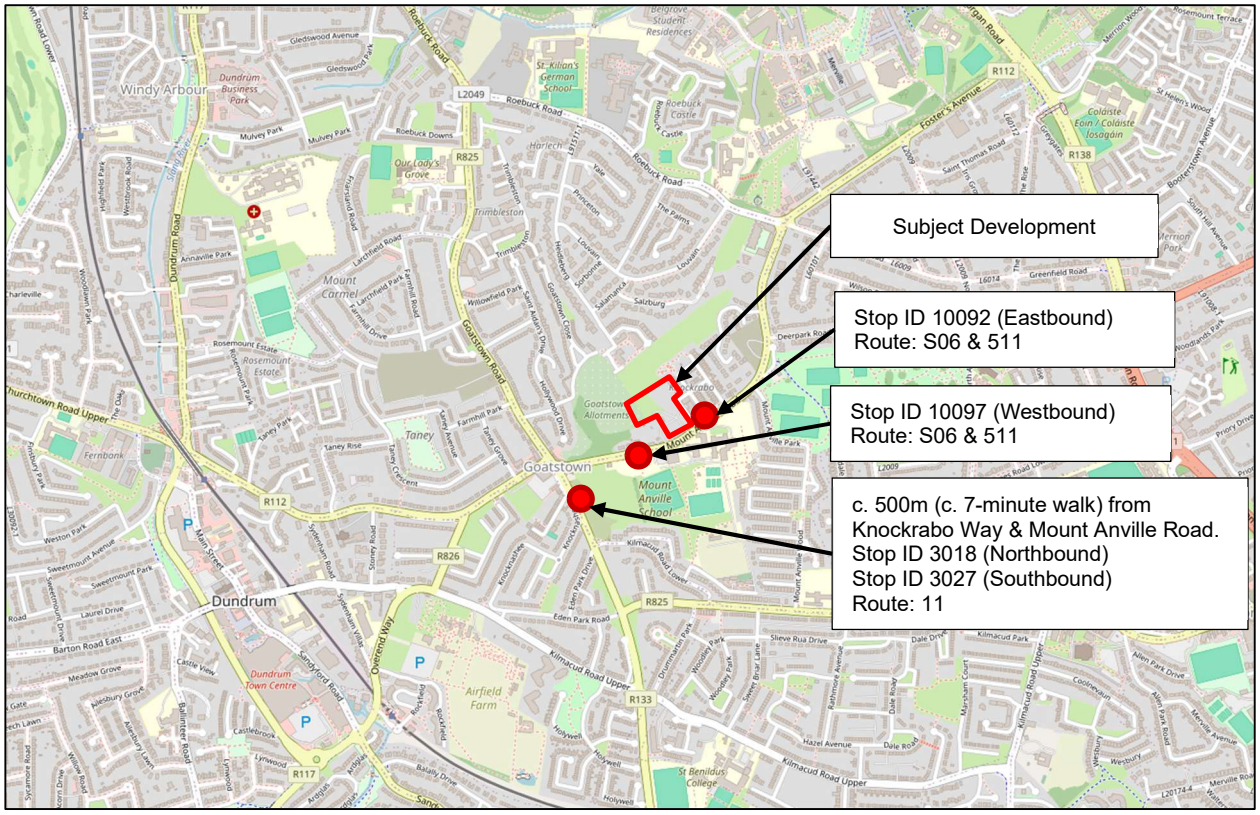

Figure 2 | Bus Network – Walking distance from development to closest Bus Stop

The routes that serve the bus stops shows in figure above, are listed below and a summary of the frequency of each route is indicated in **Table 1** below. The full bus timetables are provided in the Waterman Moylan Report No. 20-*086r.004 Traffic and Transport Assessment*, *Appendix B,* which is included in the documentation package.

- **Bus Stop 10092 & 10097:** Located at Mount Anville Road. This stop is served by Joe Moroney Coach Hire Ltd, Route 511 and by Go Ahead Ireland, route S6. The former, due to the nature of the service and the hours of operation, is presumed intended for the students of the Mount Anville Junior School & Secondary School students and may not be of interest to local residents.
- **Bus Stop 3018 & 3027:** Located at Drummartin Road. This Bus stop is served by Dublin Bus, route 11.

Route	Stop ID Route Name	Weekday Frequency	Saturday Frequency	Sunday Frequency
Bus Stop 10092 & 10097				
511	Ardilea, Mount Anville School – Rathgar, Dartry Road	1 service 6:10	No Service	No Service
	Rathgar, Dartry Road - Ardilea, Mount Anville School	1 service 8:25	No Service	No Service
S6	Stop ID 7719 (Westbound) The Square – Blackrock Station	Every 15 Minutes between 06:04 and 23:58	Every 15-20 Minutes between 06:04 and 23:59	Every 30 Minutes between 08:03 and 23:58
	Stop ID 10160 (Eastbound) BlackRock Station – The Square	Every 15 Minutes between 05:44 and 23:42	Every 15-20 Minutes between 06:14 and 23:43	Every 30 Minutes between 07:42 and 23:43
Bus Stop 3018 & 3027				
11	Stop ID 3018 (Northbound) Wadelai PK – Sandyford Ind Estate	Every 20-30 Minutes between 07:38 and 23:44	Every 30 Minutes between 07:43 and 23:48	Every 30 Minutes between 11:20 and 23:41
	Stop ID 3027 (Southbound) Sandyford Ind Estate – Wadelai PK	Every 20-30 Minutes between 06:41 and 23:37	Every 30 Minutes between 06:38 and 23:38	Every 30 Minutes between 09:26 and 23:37

Table 1 | Bus Routes – Frequency Table (source: Transport for Ireland)

The route S6, as shown in the table above, corresponds to the recently launched Bus Connects network, which commenced operation in November 2023. The route is a key service route which provides access from the Subject Development to Stillorgan Road (S138) to the East where there are the bus stops ID 2070 and ID 2009. It also provides access to the Dundrum Station Luas Green Line to the west and the bus stops in the surrounding area.

3. Luas Green Line Services

The Subject Development is situated in close proximity to two Luas Green Line stations: Dundrum and Balally. Both are situated at a distance of 1.5 km from the Subject Development. The LUAS Green Line provides convenient access to Sandyford and the city centre as seen in **Figure 4**, in addition to numerous other destinations along its route.

Figure 3 below illustrates the walking and cycling times from the subject development to the nearest LUAS stations. This is part of the Luas Green Line, providing convenient access to the city centre.

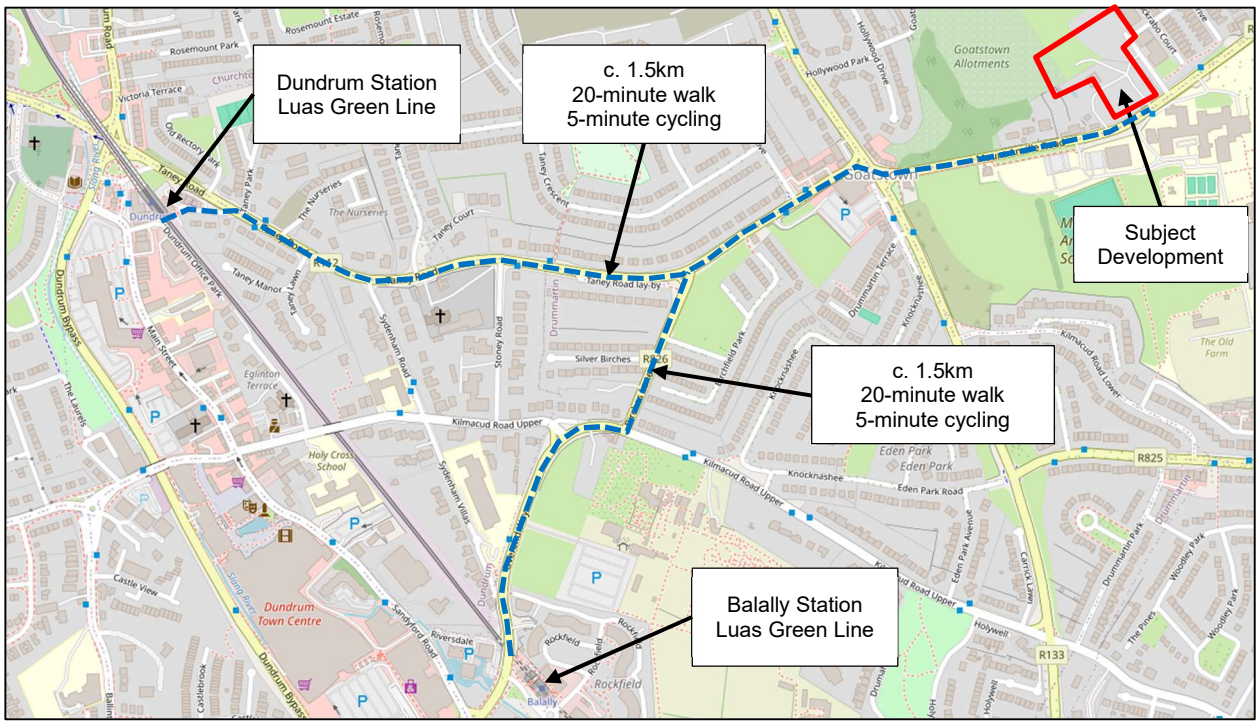

Figure 3 | Luas Green Line Stations – Walking and cycle distance from development

Figure 4 | Luas Green Line Stations

There are approximately 200 services per day in each direction between Sandyford and the City Centre. See **Table 2** and **Table 3**.

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 - 09:00	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 2 | Green Line Service Frequency – Sandyford to City Centre – Northbound
[Source: Luas Website operated by Transdev (luas.ie)]

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

Table 3 | Green Line Service Frequency - City Centre to Sandyford – Southbound
[Source: Luas Website operated by Transdev (luas.ie)]

The frequency of 200 services per day in each direction on the Sandyford – City Centre section described above reduces to 100 services per day per direction between Sandyford and Brides Glen. See **Table 4** and **Table 5** below.

Time	Average No of Trams per Hour	Total Number of Trams
05:30 - 07:00	3	4
07:00 - 08:00	5	5
08:00 - 09:00	10	10
09:00 - 10:00	6	6
10:00 - 16:00	5	30
16:00 - 19:00	6	18
19:00 - 00:00	5	25
	Total	98

Table 4 | Green Line Service Frequency – Brides Glen to Sandyford – Northbound
[Source: Luas Website operated by Transdev (luas.ie)]

Time	Average No of Trams per Hour	Total Number of Trams
05:30 - 07:00	5	7
07:00 - 10:00	6.66	20
10:00 - 16:00	4.6	28
16:00 - 19:00	6	18
19:00 - 01:18	4.6	29
	Total	102

Table 5 | Green Line Service Frequency – Sandyford to Brides Glen – Southbound
[Source: Luas Website operated by Transdev (luas.ie)]

According to information from the National Transport Authority the 55-metre-long trams have a nominal carrying capacity of 408 passengers per tram with 96 no. seats available. However, according to the LUAS web site, the operational capacity used is 315 passengers per tram allowing for what Luas call a *'comfort factor'*.

4. Subject Development

4.1 Residential Population

The development with total of c.17,312.2 sq.m. gross internal area (GIA) will consist of the construction of 158 No. residential units (12 No. houses and 146 No. apartments (35 No. 1 beds, 81 No. 2 beds, 3 No. 3 beds and 27 No. 3 bed duplex units), a childcare facility (c.400 sq.m. GIA) and Community / Leisure Uses (c. 223 sq.m. GIA).

The projected population at the development is calculated in **Table 6** below:

Type	Unit Size	Number of Units	Total residents
Apartments	1-Bed (1 person)	35	35
	2-Bed (2 persons)	81	162
	3-Bed (4 persons)	3	12
Duplex	3-Bed (4 persons)	27	108
Houses	2-Bed (3 persons)	1	3
	3-Bed (4 persons)	3	12
	4-Bed (5 persons)	8	40
	Total	**158**	**372**

Table 6 | Development population

4.2 Existing modal Split

To understand the mode of travel choice of the residents in the area, public information from the Census 2022 was used. The Census was conducted by the Central Statistics Office on 3rd April 2022, and distributed information in small areas that divide the territory.

The modal split based on statistical data provides insight into the behaviour of residents in the surrounding area of the Subject Development. It is therefore likely that residents of the Subject Development exhibit similar behaviour to that statistically surveyed.

It is important to choose a wide number of areas to obtain representative values that will enable us to anticipate the future behaviour of the people residing in the subject site. For this reason, 21 representative areas have been selected to reflect the Subject Development.

The consulted Small Areas are illustrated in **Figure 5** below.

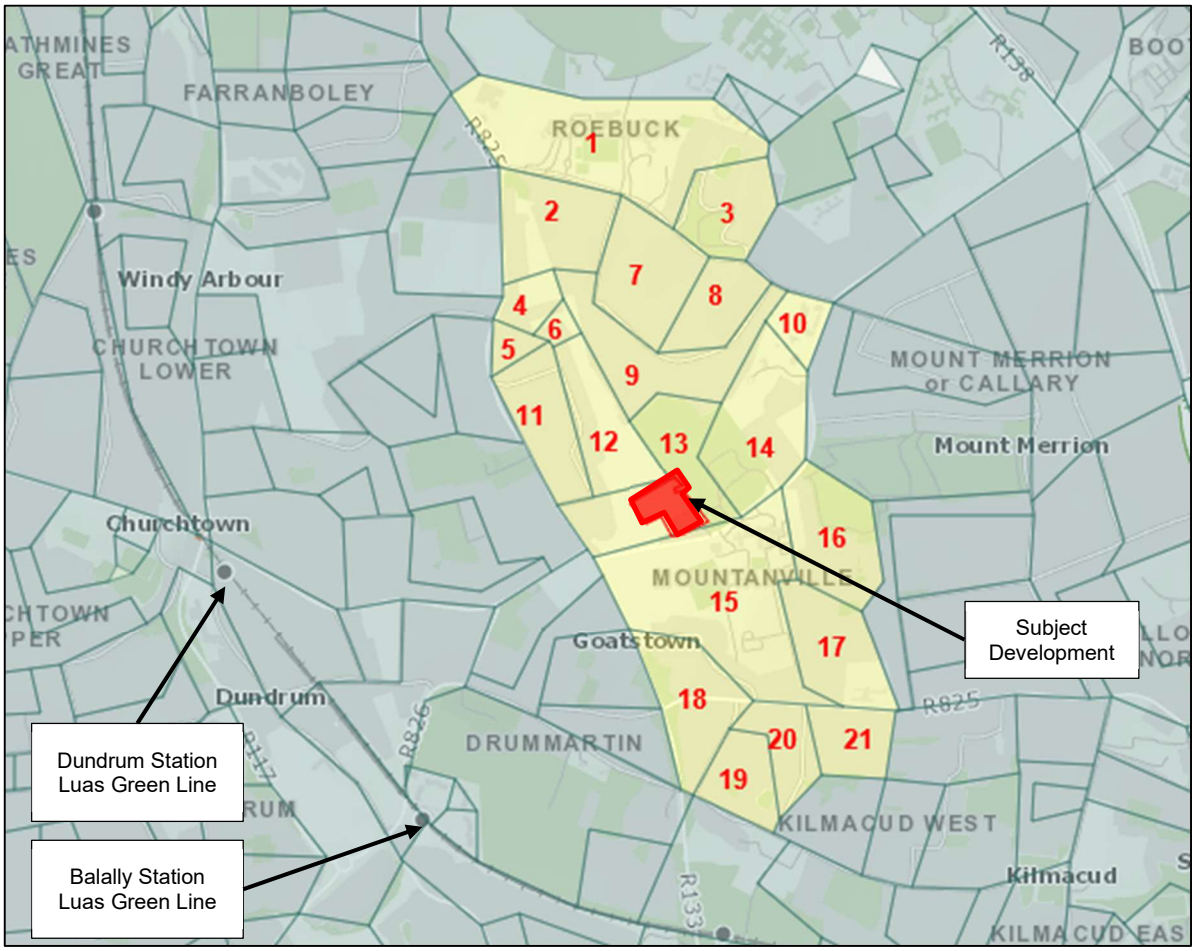

Figure 5 | Consulted Small Areas – Census 2022

The results show that there are 2,160 houses and 5,833 people living in the 21 small areas considered. The total number of trips is 3,564 with the following breakdown.

Modal Split									
Zone	House	Persons	On foot	Bike	Bus, minibus or coach	Train, DART or LUAS (**)	Motors (*)	Other or not stated	Total travels
1	113	311	45	35	34	6	81	33	201
2	103	288	51	18	7	6	81	28	163
3	102	299	56	26	14	8	96	27	200
4	144	258	28	21	24	7	64	28	144
5	82	188	22	10	13	11	59	35	115
6	91	209	37	19	13	9	65	23	143

7	113	302	38	19	24	2	91	34	174
8	94	248	34	23	12	5	82	30	156
9	81	251	21	16	15	9	87	25	148
10	102	214	42	16	21	3	70	35	152
11	98	334	46	33	16	14	113	35	222
12	133	372	46	22	23	20	120	43	231
13	119	307	28	20	10	7	134	35	199
14	144	397	55	16	13	18	145	68	247
15	67	160	24	8	3	5	45	15	85
16	103	274	44	6	10	6	48	30	114
17	109	308	34	20	14	8	71	41	147
18	105	332	60	29	11	29	107	31	236
19	85	270	39	18	12	19	80	27	168
20	98	293	49	21	12	12	84	34	178
21	74	218	34	14	9	19	65	10	141
Total	**2160**	**5833**	**833**	**410**	**310**	**223**	**1788**	**667**	**3564**
			23.4%	**11.5%**	**8.7%**	**6.3%**	**50.2%**		**100%**

Table 7 | Modal Split

(*) Includes Motorcycle or Scooter, Car Drivers, Car Passengers, and Vans

(**) It is assumed that all travels indicated in the “Train, DART and LUAS” column are people using the Luas to commute.

The table above shows that 8.7% of people living in the surrounding area choose the bus as their main mode of transport to work and 6.3% choose the Luas.

In addition, using the information from the census 2022, it is possible to obtain the distribution of travel time during the AM peak hour for all modal split, as shown in the following table.

	Time Distribution of Trips									
Zone	before 06:30	6:30 - 7:00	7:01 - 7:30	7:31 - 8:00	8:01 - 8:30	08:31 - 9:00	09:01 - 9:30	After 9:30	Not Stated	Total travels
1	4	18	17	54	41	25	8	17	18	184
2	1	12	15	43	42	25	4	10	10	152
3	3	16	13	53	48	37	8	5	12	183
4	5	20	17	35	25	25	4	9	14	140
5	0	8	8	32	23	20	5	4	16	100
6	0	17	12	40	35	16	6	7	8	133
7	7	13	12	60	38	13	7	16	12	166
8	2	10	21	43	41	14	3	11	5	145
9	2	4	22	39	38	20	9	6	6	140

10	3	15	17	32	32	31	7	8	20	145
11	10	15	13	59	49	35	5	18	14	204
12	9	18	17	80	42	34	4	15	23	219
13	3	10	26	60	43	22	4	11	17	179
14	5	11	18	94	61	19	4	14	33	226
15	3	3	8	19	26	16	2	6	2	83
16	1	5	12	32	29	24	2	4	14	109
17	2	9	12	44	38	26	2	5	6	138
18	4	14	27	47	73	37	5	6	9	213
19	5	12	17	42	40	20	2	12	2	150
20	6	9	12	30	52	36	8	5	10	158
21	6	15	14	29	38	16	4	7	0	129
	81	**254**	**330**	**967**	**854**	**511**	**103**	**196**		**3,296**
	2.5%	**7.7%**	**10.0%**	**29.3%**	**25.9%**	**15.5%**	**3.1%**	**5.9%**		**100%**

Table 8 | Time Distribution of trips

The table above shows that peak travel occurs between 7:30 and 8:30 AM.

Based on the analysis of the behaviour observed during the surveys carried out (refer to **Section 5** below), it can be assumed that

- Luas distribution is: 70% northbound and 30% southbound.
- Bus distribution is: 25% northbound, 25% eastbound, 25% westbound, and 25% southbound.

4.3 Target Modal Split

The targets presented in this section are set out with the objective of developing the strategies on which the Travel Plan report is based (refer to Waterman Moylan Report 20-086r.006 Travel Plan, included in the documentation package).

The Dún Laoghaire-Rathdown County Development Plan 2022-2028 indicates the following travel mode targets:

> *The travel mode share target shall at minimum meet the Smarter Travel targets (or any subsequent updated national/regional targets) - peak hour transport mode split of a maximum of 45 % trips by Car Driver and 55% minimum by sustainable modes (walking, cycling and public transport*

The target modal split has been established for the tenth year from the opening of Subject Development (2027), with the previous values serving as a reference point.

The following table presents the modal split objective for the Travel Plan:

Mode	Census 2016	Census 2022	Target 2036
Motors	59%	50%	35%
Public Transport - Bus	7.7%	8.7%	15%
Public Transport - Luas	6.4%	6.3%	10%
Walk	15%	23%	25%
Cycle	2%	12%	15%
Total	100%	100%	100%

Table 9 | *Target Modal Split for Residents Journey to Work, School, or College 2016-2027 (Source: Dún Laoghaire-Rathdown County Development Plan 2022-2028).*

The aforementioned objectives can be achieved by considering the potential for public transport in the surrounding area, as presented in Sections 3 and 4 of this report.

Based on the number of residents within the Subject Site, the expected modal split is detailed bellow.

Mode	Target Modal Split	Number of Residents (Total: 372)	Trips during peak hour: 7:30-8:30 (55,2%)
On foot	25%	93	51
Bike	15%	56	31
Bus, minibus or coach	15%	56	Northbound: 8 Eastbound: 8 Southbound: 8 Westbound: 8
Train, DART or LUAS	10%	37	Northbound: 14 Southbound: 6
Motors	35%	130	72
Total	**100%**	**372**	**206**

Table 10 | Projected Modal Split for Residents during the AM peak hour

Given that the Census 2022 provides a detailed time distribution of trips only during the morning, the PM peak hour is assumed to occurs between 5pm and 6pm, consistent with the traffic survey results presented in the Traffic and Transport Assessment.

It is also assumed that the number of residents traveling to/from the subject site and the selected modal split are the same during both the AM and PM peak hours. This is an overestimation, as shown in **Table 8** above, the number of people traveling from the site between 7:30 and 8:30 is c. 55%, while the number of people traveling after 9:30 is c. 6%.

Therefore, for the PM peak hour the expected modal split is detailed below.

Mode	Target Modal Split	Number of Residents (Total: 372)	Trips during peak hour: 17:00-18:00 (55,2%)
On foot	25%	93	51
Bike	15%	56	31
Bus, minibus or coach	15%	56	Northbound: 8 Eastbound: 8 Southbound: 8 Westbound: 8
Train, DART or LUAS	10%	37	Northbound: 14 Southbound: 6
Motors	35%	130	72
Total	**100%**	**372**	**206**

Table 11 | Projected Modal Split for Residents during the PM peak hour

5. Public Transport Survey

As part of the transportation capacity assessment, Waterman Moylan conducted bus and LUAS capacity surveys during both the AM and PM peak hours.

The surveyed bus stops are:

- Bus Stop 3027 Northbound
- Bus Stop 3018 Southbound
- Bus Stop 10092 Eastbound
- Bus Stop 10097 Westbound

Regarding to the Luas services, the Dundrum Green Luas Rail Station was surveyed.

5.1 Survey criteria

The demand profile for public transport services, like road traffic, is quite seasonal in nature. The timing and basis for the survey undertaken is vindicated by the reality of public transport usage patterns.

- Demand for bus and rail services, in general, is materially lower during the Summer and school holiday periods.
- Demand tends to be somewhat higher in the late Autumn and in the run up to the busy Christmas holiday. Surveying in the non-holiday weeks during the opening four or five months of the year and early Autumn, represents a reliable indication of base-level pre-development expressed demand for transport.
- Demand also varies by day of the week, with traffic demand generally lower on Mondays and Fridays, with some exceptions. Public transport usage on Saturdays and Sundays (in particular) is materially lower than mid-week demand.
- Demand for travel varies throughout the standard weekday - the morning peak is shorter but has patronage levels that are higher than the corresponding evening peak flows.

It follows that in determining whether spare capacity is available to meet increasing demand from any development site, it is best to undertake surveys and test the midweek morning peaks outside of the summer period and when schools are open. This advice was followed in the timing of the survey undertaken for this report.

Therefore, Tuesday, Wednesday or Thursday in April / May or September / October are regarded as neutral days and months in terms of transportation surveys when the most reliable indicators of demand and capacity can be ascertained.

5.2 Survey Dates

The transport public surveys were carried out by Waterman Moylan on Tuesday 14th May 2024, Tuesday 8th October 2024 and Wednesday 9th October 2024, during both peak hours, morning and evening, following the criteria set out in **Section 4.2** above.

The survey was carried out in the morning between 07.00 and 09.00 and in the evening between 16.30 and 18.30, in line with the expected demand profile for bus and Luas journeys outlined above.

The survey aimed to record the number of services passing through each bus stop and Luas station, as well as the number of users and passengers boarding and disembarking each means of transport, and the available capacity of each unit.

5.3 Bus Capacity Survey – AM Peak Hour

During the survey it was observed that the northbound buses were Volvo (Euro 6) with a capacity of 95 passengers.

The table below presents the results of the survey carried out during the AM peak hour.

Hour arrival	Route No.	Deck	Capacity (seating + standing)	No. passenger Boarding	No. passenger disembarking	No. Passenger upon departure	Spare Capacity
Bus Stop 3027 Northbound							
7.23	11	Double	95	0	0	12	83
7.42	11	Double	95	0	0	9	86
8.07	11	Double	95	0	0	23	72
8.29	11	Double	95	0	0	14	81
8.52	11	Double	95	1	1	18	77
Total	**3 services during the AM peak hour (7:30 – 8:30)**						**239**
Bus Stop 3018 Southbound							
7.31	11	Double	95	0	0	11	84
7.59	11	Double	95	0	1	6	89
8.28	11	Double	95	1	2	11	84
8.40	11	Double	95	0	1	7	88
Total	**3 services during the AM peak hour (7:30 – 8:30)**						**257**
Bus Stop 10092 Eastbound							
7.10	S6	Double	95	0	0	22	73
7.24	S6	Double	95	0	0	28	67
7.58	S6	Double	95	0	0	64	31
8.02	S6	Double	95	3	0	15	80
8.20	S6	Double	95	1	0	20	75
8.29	S6	Double	95	3	0	25	70
8.44	S6	Double	95	0	0	20	75
Total	**4 services during the AM peak hour (7:30 – 8:30)**						**256**
Bus Stop 10097 Westbound							
7.11	S6	Double	95	2	1	8	87
7.32	S6	Double	95	2	0	13	82

7.38	S6	Double	95	2	0	4	91
8.02	S6	Double	95	0	0	12	83
8.17	S6	Double	95	0	0	22	73
8.51	S6	Double	95	3	0	19	76
Total	**4 services during the AM peak hour (7:30 – 8:30)**						**329**

Table 12 | Bus Capacity Survey – AM Peak Hour

The spare capacity Northbound was 239 passengers (**Table 12**), which is sufficient to cover the potential future passenger demand of 8 passengers shown in **Table 10** above.

The spare capacity Southbound was 257 passengers (**Table 12**), which is sufficient to cover the potential future passenger demand of 8 passengers shown in **Table 10** above.

The spare capacity Eastbound was 256 passengers (**Table 12**), which is sufficient to cover the potential future passenger demand of 8 passengers shown in **Table 10** above.

The spare capacity Westbound was 329 passengers (**Table 12**), which is sufficient to cover the potential future passenger demand of 8 passengers shown in **Table 10** above.

5.4 Bus Capacity Survey – PM Peak Hour

The table below presents the results of the survey carried out during the PM peak hour.

During the survey, it was observed that the northbound buses were Volvo B7TL with a capacity of 91 passengers, while the rest of the buses were Volvo (Euro 6) with a capacity of 95 passengers.

Hour arrival	Route No.	Deck	Capacity (seating + standing)	No. passenger Boarding	No. passenger disembarking	No. Passenger upon departure	Spare Capacity
Bus Stop 3027 Northbound							
16:52	11	Double	91	2	4	70	25
17:15	11	Double	91	2	1	71	24
17:34	11	Double	91	1	4	53	42
18:00	11	Double	91	4	2	64	31
18:15	11	Double	91	1	2	78	17
Total	**3 services during the PM peak hour (17:00 – 18:00)**						**97**
Bus Stop 3018 Southbound							
16:51	11	Double	95	3	2	74	21
17:15	11	Double	95	0	3	60	35
17:56	11	Double	95	3	0	43	52
17:57	11	Double	95	0	5	32	63
18:27	11	Double	95	0	1	80	15

Total	**3 services during the PM peak hour (17:00 – 18:00)**						**150**
Bus Stop 10092 Eastbound							
16.24	S6	Double	95	2	0	55	40
16.37	S6	Double	95	1	1	83	12
17.00	S6	Double	95	2	0	73	22
17.09	S6	Double	95	0	2	79	16
17.30	S6	Double	95	1	3	69	26
17.40	S6	Double	95	0	1	45	50
17.57	S6	Double	95	0	2	75	20
18.10	S6	Double	95	0	2	69	26
18.20	S6	Double	95	1	0	66	29
Total	**5 services during the PM peak hour (17:00 – 18:00)**						**134**
Bus Stop 10097 Westbound							
16.22	S6	Double	95	2	0	77	18
16.40	S6	Double	95	0	0	80	15
16.50	S6	Double	95	0	1	82	13
17.22	S6	Double	95	2	1	78	17
17.30	S6	Double	95	0	4	69	26
18.03	S6	Double	95	3	1	60	35
18.04	S6	Double	95	1	0	87	8
18.21	S6	Double	95	0	1	70	25
Total	**2 services during the PM peak hour (17:00 – 18:00)**						**43**

Table 13 | Bus Capacity Survey – PM Peak Hour

The spare capacity Northbound was 97 passengers (**Table 13**), which is sufficient to cover the potential future passenger demand of 8 passengers shown in **Table 11** above.

The spare capacity Southbound was 150 passengers (**Table 13**), which is sufficient to cover the potential future passenger demand of 8 passengers shown in **Table 11** above.

The spare capacity Eastbound was 134 passengers (**Table 13**), which is sufficient to cover the potential future passenger demand of 8 passengers shown in **Table 11** above.

The spare capacity Westbound was 43 passengers (**Table 13**), which is sufficient to cover the potential future passenger demand of 8 passengers shown in **Table 11** above.

5.5 LUAS Capacity Survey – AM Peak Hour

The table below presents the results of the survey carried out.

Hour arrival	Capacity (seated + standing)	No. passenger Boarding	No. passenger disembarking	No. Passenger upon departure	Spare Capacity
Northbound					
7.29	315 = 96 + 219	45	9	188	127
7.34	315 = 96 + 219	41	5	203	112
7.40	315 = 96 + 219	32	11	201	114
7.42	315 = 96 + 219	34	2	145	170
7.46	315 = 96 + 219	40	14	180	135
7.52	315 = 96 + 219	39	1	164	151
7.54	315 = 96 + 219	42	25	164	151
7.57	315 = 96 + 219	31	18	129	186
8.03	315 = 96 + 219	45	21	241	74
8.06	315 = 96 + 219	51	3	196	119
8.09	315 = 96 + 219	49	15	238	77
8.12	315 = 96 + 219	41	20	182	133
8.15	315 = 96 + 219	38	2	207	108
8.18	315 = 96 + 219	45	12	259	56
8.25	315 = 96 + 219	52	21	299	16
8.29	315 = 96 + 219	66	28	308	7
8.33	315 = 96 + 219	62	6	314	1
8.36	315 = 96 + 219	70	11	241	74
8.37	315 = 96 + 219	32	8	183	132
8.41	315 = 96 + 219	31	7	137	178
Total	**15 services during the AM peak hour (7:30 – 8:30)**				**1,609**
Southbound					
7.30	315 = 96 + 219	21	2	103	212
7.36	315 = 96 + 219	26	15	164	151
7.39	315 = 96 + 219	6	4	145	170
7.44	315 = 96 + 219	15	7	160	155
7.49	315 = 96 + 219	25	5	159	156
7.54	315 = 96 + 219	31	0	139	176
7.57	315 = 96 + 219	26	24	115	200

8.03	315 = 96 + 219	48	5	153	162
8.10	315 = 96 + 219	45	18	195	120
8.13	315 = 96 + 219	12	5	106	209
8.20	315 = 96 + 219	31	4	201	114
8.23	315 = 96 + 219	25	21	139	176
8.28	315 = 96 + 219	18	18	181	134
8.36		28	12	136	179
Total	**13 services during the AM peak hour (7:30 – 8:30)**				**2,135**

Table 14 | LUAS Capacity Survey – AM Peak Hour

The spare capacity Northbound was 1,609 passengers (**Table 14**), which is sufficient to cover the potential future passenger demand of 14 passengers shown in **Table 10** above. The spare capacity Southbound was 2,135 passengers (**Table 14**), which is sufficient to cover the potential future passenger demand of 6 passengers shown in **Table 10** above.

5.6 LUAS Capacity Survey – PM Peak Hour

During the AM Peak Hour survey, 7 No. units northbound and 6 No. units southbound were surveyed. The following describes the type and capacity of each train:

The table below presents the results of the survey carried out.

Hour arrival	Capacity (seated + standing)	No. passenger Boarding	No. passenger disembarking	No. Passenger upon departure	Spare Capacity
Northbound					
16.52	315 = 96 + 219	26	12	52	263
16.58	315 = 96 + 219	12	17	173	142
17.02	315 = 96 + 219	18	25	54	261
17.12	315 = 96 + 219	54	21	234	81
17.15	315 = 96 + 219	49	33	144	171
17.17	315 = 96 + 219	12	21	138	177
17.24	315 = 96 + 219	38	16	210	105
17.26	315 = 96 + 219	15	10	226	89
17.29	315 = 96 + 219	13	21	187	128
17.32	315 = 96 + 219	28	16	124	191
17.38	315 = 96 + 219	32	24	208	107
17.41	315 = 96 + 219	19	5	101	214
17.45	315 = 96 + 219	12	12	73	242

17.53	315 = 96 + 219	48	27	277	38
17.55	315 = 96 + 219	19	17	190	125
17.58	315 = 96 + 219	18	23	172	143
18.00	315 = 96 + 219	10	2	62	253
18.09	315 = 96 + 219	55	19	207	108
18.11	315 = 96 + 219	31	24	90	225
Total	**15 services during the PM peak hour (17:00 – 18:00)**				**2,325**
Southbound					
16.50	315 = 96 + 219	25	24	256	59
16.53	315 = 96 + 219	2	23	89	226
16.59	315 = 96 + 219	13	35	164	151
17.02	315 = 96 + 219	5	18	69	246
17.13	315 = 96 + 219	22	72	276	39
17.15	315 = 96 + 219	3	41	135	180
17.18	315 = 96 + 219	17	24	178	137
17.21	315 = 96 + 219	12	46	151	164
17.27	315 = 96 + 219	22	72	294	21
17.32	315 = 96 + 219	9	67	218	97
17.35	315 = 96 + 219	10	29	314	1
17.44	315 = 96 + 219	18	59	297	18
17.48	315 = 96 + 219	22	52	304	11
17.50	315 = 96 + 219	3	55	192	123
17.53	315 = 96 + 219	12	27	203	112
17.55	315 = 96 + 219	11	32	127	188
18.01	315 = 96 + 219	14	42	285	30
18.04	315 = 96 + 219	5	57	197	118
Total	**13 services during the PM peak hour (17:00 – 18:00)**				**1,337**

Table 15 | LUAS Capacity Survey – PM Peak Hour

The spare capacity Northbound was 2,325 passengers (**Table 15**), which is sufficient to cover the potential future passenger demand of 14 passengers shown in **Table 10** above. The spare capacity Southbound was 1,337 passengers (**Table 15**), which is sufficient to cover the potential future passenger demand of 6 passengers shown in **Table 10** above.

6. Summary

6.1 Demand v Capacity

This public transport capacity assessment was carried out by Waterman Moylan on the bus and Luas services which will be available to residents of the proposed development on the subject site.

The capacity of the existing public transport services has been demonstrated to be more than adequate to cater for existing demand and from future demand from residents living in the proposed development. See **Table 16** below.

As shown in the table below, the existing public transport system is sufficient to meet the commuting needs of the residents of the proposed development.

Service Type	No of Services	Total Capacity	Development Demand	Demand as % of Capacity
AM Peak Hour (7:30 – 8:30)				
Bus – Northbound	3	239	8	3.4%
Bus – Southbound	3	257	8	3.1%
Bus – Eastbound	4	256	8	3.0%
Bus – Westbound	4	329	8	2.4%
Luas – Northbound	15	1,609	14	0.9%
Luas – Southbound	13	2,135	6	0.3%
PM Peak Hour (17:00 – 18:00)				
Bus – Northbound	3	97	8	8.6%
Bus – Southbound	3	150	8	5.3%
Bus – Eastbound	5	134	8	6.0%
Bus – Westbound	2	43	8	21.5%
Luas – Northbound	15	2,325	14	0.6%
Luas – Southbound	13	1,337	6	0.5%

Table 16 | Summary Public Transport Survey - Demand v Capacity

UK and Ireland Office Locations