

PUBLIC TRANSPORT CAPACITY ASSESSMENT

NEWCASTLE SOUTH SITE,
NEWCASTLE, CO DUBLIN.

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1. Introduction.

1.1 Cairn Homes Properties Limited intends to apply to An Bord Pleanála for planning permission for a strategic housing development (SHD) at Newcastle South, Newcastle, Co Dublin. This report, by Derry O’Leary B.E., M.Sc, M.B.A., Transport Consultant, has been commissioned by the developer to provide an overview of the adjacent existing bus network, assess the available spare capacity in the current public transport network and review the implications for the proposed National Transport Authority’s BusConnects network in the area. The author, a Civil Engineer, qualified as a Traffic Engineer and has over 40 years experience in both the public and private sectors. He has spent nearly 30 years in both planning and operations in Dublin Bus. This report supplements the Traffic and Transport Assessment (TTA) undertaken by DBFL Consulting Engineers on the subject site.

1.2 Site Description

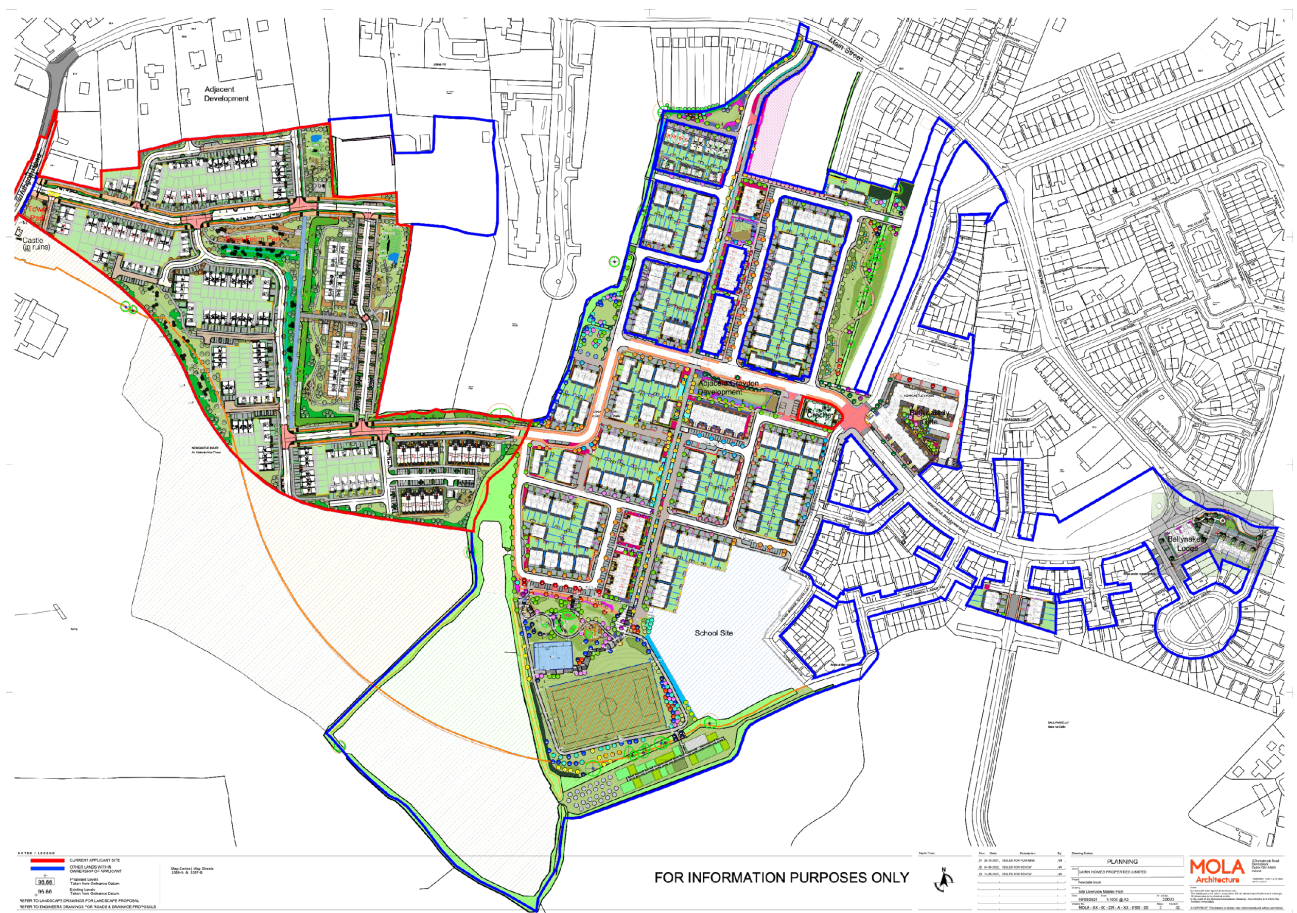


Figure 1. Newcastle South Site Map.

The proposed development site at Newcastle South to be assessed for public transport capacity is shown in Figure 1 above. It will consist of the construction of 280 no. dwellings and associated ancillary infrastructure on a site of c. 8.47 hectares as follows:

- 128 no. 2 storey houses (8 no. 2 bedroom houses, 94 no. 3 bedroom houses, 25 no. 4 bedroom houses and 1 no. 5 bedroom house);
- 116 no. apartments in 2 no. 5 storey buildings comprising (54 no. 1 bedroom apartments & 62 no. 2 bedroom apartments, all with terrace or balcony along with solar panels and green roofs at roof level)
- 36 no. apartments/duplex apartments in 3 no. 3 storey buildings – (18 no. 2 bedroom apartments and 18 no. 3 bedroom duplex apartments) all with terrace;
- Amendment to permitted Creche (c. 518sqm) in 'Graydon' (TA06S.305343) to now provide a Creche of c. 778 sq. m of 2 no. storeys;
- Open space, hard and soft landscaping (including public lighting & boundary treatment), communal open space for duplex apartments and apartments; along with single storey bicycle/bin stores and ESB substation;
- Vehicular access from the Athgoe Road from a new signalised junction along with upgrades to footpath and pedestrian crossing as well as provision of link to permitted 'Graydon' (TA06S.305343) 'Newcastle Boulevard' to the east, as well as 423 no. car parking spaces and 362 no. cycle spaces and all internal roads, cycleways, green routes and paths;
- Attenuation, connection to water supply, and provision of foul drainage infrastructure as well as underground local pumping station to Irish Water specifications and all ancillary site development/construction/landscaping works.

1.3 In **Chapter Two** the background to the new structure to the organisation of public transport services is outlined. The National Transport Authority's (NTA) early moves to open up the bus market in Ireland is described in **Chapter Three**. The key aspects of the innovative BusConnects project for the Greater Dublin Area are presented in **Chapter Four**. In **Chapter Five** the existing bus routes and rail network serving the Newcastle site are outlined. The bus survey undertaken near the subject site and rail demand trends at the nearby Hazelhatch & Celbridge station are analysed in **Chapter Six** where the capacity of both networks to cater for anticipated generated trips from the planned development are assessed. In **Chapter Seven** the soon-to-be implemented changes to the Newcastle bus network under the BusConnects project are compared with the existing services. The major upgrade to the rail network with the proposed DART+ South West project which will benefit the subject site is described in **Chapter Eight**. Finally, in **Chapter Nine**, the key conclusions in the report on the status of the existing public transport network available to residents in the Newcastle South area are outlined.

2. Background to Dublin's Public Transport Network

2.1 While the customer-facing bus network serving the Greater Dublin Area has been relatively stable in recent years, the organisation of these operations has undergone quite significant structural change in the last decade or so. The National Transport Authority (NTA), established in 2009, has a wide range of roles in the transport sector. One of these remits is its role as public transport Regulator. Under this relatively new regime, the overall planning of bus and rail services nationwide has moved from the CIE Group of companies to the NTA. In practical terms this means that responsibility for the public transport network and individual route designs, frequencies, fares and timetable details, etc. now lies solely with the Regulator. All operators providing services under Public Service Obligation (PSO) or State subvention do so under contract to the NTA. Under this new arrangement even the smallest modification to any bus route or timetable must be agreed with the NTA in advance of implementation. The NTA also approves and allocates licences to commercial bus operators, subject to agreed routes, timetables and conditions. Irish Rail services, including the Dublin Commuter and DART in this instance, also come within the ambit of the NTA.

2.2 In 2015, the NTA commenced a comprehensive review of the efficiency and effectiveness of the Greater Dublin Area's (GDA) bus network, branded as BusConnects. This bus route redesign project has now advanced to reach the implementation stage with two phases launched in 2021. In parallel, the NTA also began a Bus Market Opening (BMO) process designed to open up much of the Irish bus market to competition. This involved opening up some existing routes operated by the CIE companies to competition by way of tender. These two key developments are now briefly outlined below.

3. Bus Market Opening (BMO)

3.1 For decades the key urban and interurban bus (and rail) markets have been dominated by the CIE group of companies such as Dublin Bus and Bus Eireann. In order to further open the Irish bus market to private sector rivals to the incumbent State-owned operators, the NTA first tendered a package of orbital bus routes previously operated by Dublin Bus in 2016. This group of 24 orbital routes, and total fleet of 125 buses, represented roughly 10% of the total bus market in the Greater Dublin Area (GDA). Following the competitive tendering process, the Go-Ahead Group (a largely UK-based bus and rail operator with large overseas businesses) was selected to operate these routes. The seamless transfer of routes, in stages, from Dublin Bus to Go-Ahead Ireland (GAI) took place over a 12-month period in 2018/2019. The switch was barely noticed by the general public and passengers alike, as the new operations were introduced under the NTA's Transport for Ireland (TFI) brand. At this point in time all of the PSO routes operating near the subject site in Newcastle are radial in nature and therefore are still operated by Dublin Bus.

3.2 All PSO operators, whether in private ownership or State-owned, operate bus services under contract to the NTA and must meet a set of key performance indicators (KPIs) including those covering reliability, timekeeping and vehicle maintenance. Similar standards are expected of all contracted operators and failure to meet the targets can result in fines or contract cessation. Both the performance standards expected of contractors and the level of fines exacted for not meeting those standards are in the public domain.

3.3 The NTA entirely owns the current fleet deployed by GAI to operate its routes in the Greater Dublin Area. It appears that, over time, the entire publicly-owned public transport fleet will be owned by the NTA as the fleet is renewed and the Authority obtains the capital funding to buy and replace buses for use in the PSO networks across Ireland. The next tranche of buses ordered by the NTA for the Dublin urban market are fully-electric

traction. The delivery of the first of these EV buses is anticipated in 2024, and they are expected to commence operating, following commissioning, in 2025.

4. Bus Connects Project Overview.

4.1 This comprehensive re-design of the urban bus network in the Greater Dublin Area (GDA) was commenced by the NTA in 2015. In tandem with the bus service re-designs, the major radial bus route alignments on existing QBCs, under the NTA proposals, will be upgraded to radically enhance bus priority measures. This capital investment on the QBC alignments is required to further protect the major funding rise in the enhanced bus operation from the adverse impacts on reliability caused by traffic congestion. The key objective is to improve average bus speeds significantly. These Core Bus Corridors (CBCs), along which the high-frequent “Spine routes” will run, and the revised routes themselves have been through a series of extensive consultation phases with the general public and key stakeholders. Local Authorities have been directly involved in both the bus route and CBC design process. The route network consultation process, which concluded in 2020, modified the proposals following the review of tens of thousands of submissions by members of the public and key stakeholders. The final network has now been agreed.

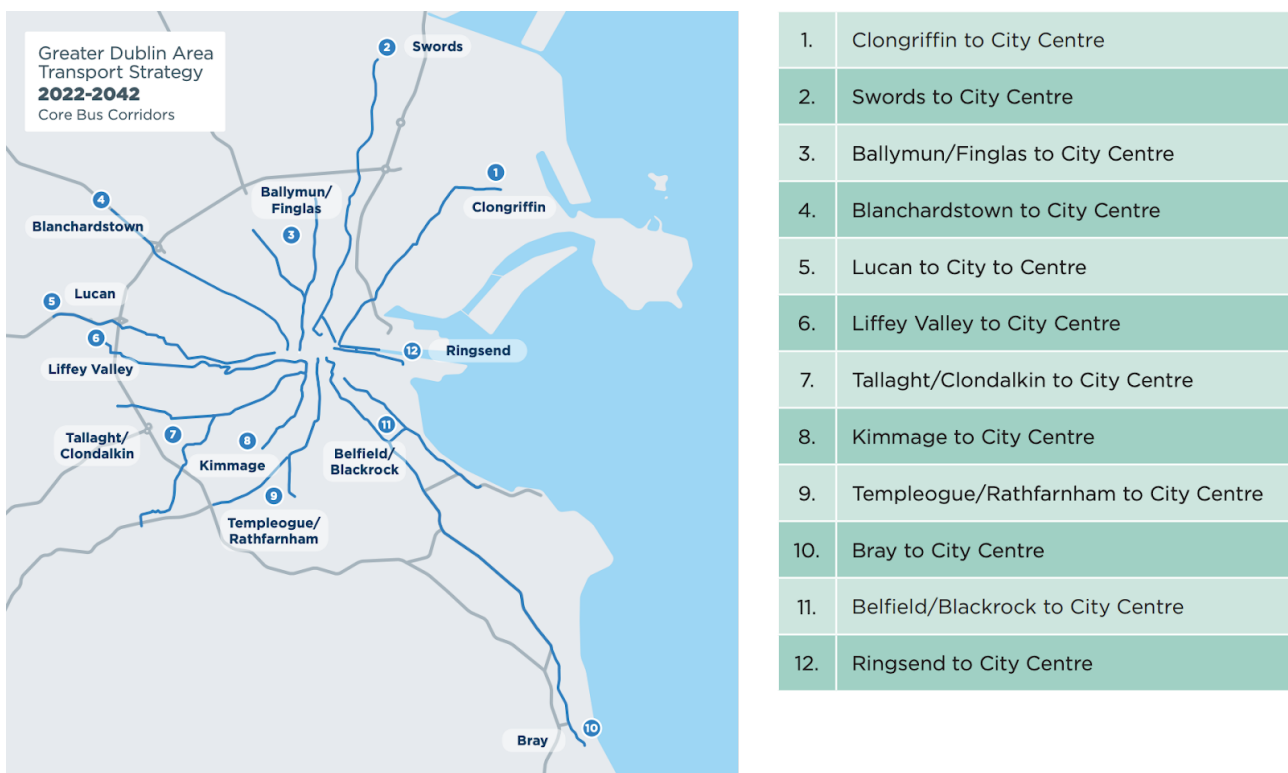


Figure 2. NTA’s Core Bus Corridors (CBCs). The Tallaght/Clondalkin CBC on corridor 7 is the most relevant for the Newcastle subject site.

4.2 Phased implementation of new Spine routes has already started. To date, only three of the many phases required to modify the bus network in the Greater Dublin Area have been introduced. The first two phases involved new Spine routes while the latest BusConnects route changes involved the first tranche of orbital bus routes north of the city centre. The C-Spine and H-Spine changes have been introduced in parts of the west and north suburbs of Dublin. While some of the C-Spine routes now operate relatively close to the subject site under review here they are still too far away to have a significant impact. For example, while route C4, which operates from Maynooth to Ringsend, serves nearby Celbridge it is deemed to be outside the catchment area of the site. Two so-called “Local” routes - the L58 and L59 - were introduced along with the C-Spine changes. They operate from River Forest in Leixlip on different alignments, via Celbridge, to Hazelhatch Rail Station, to within 4km of the subject site. All the existing and planned routes in the immediate Newcastle area are discussed in greater detail in section 5, 6 and 7.

4.3 Further Bus Connects phases, including routes of more direct relevance here, have been designed and planned but will take a couple of years to implement. The whole network of new services is expected to be implemented in phases by 2024. The future BusConnects bus network serving the Newcastle, Co Dublin area is addressed in section 7. The Core Bus Corridors, effectively QBC upgrades, will shortly be the subject of a formal planning application. The CBC proposals will have minimal impact on bus services in Newcastle given their location, some distance from the development site, and the nature of the bus routes in the area.

5. Existing Public Transport Network Serving the Newcastle Site.

5.1 The subject site is located immediately south of the Main St in Newcastle, Co Dublin as shown in Figure 1 above. Future residents commuting towards Dublin and elsewhere wishing to avail of public transport services have two broad options. They can directly access the existing/future bus network in Newcastle Main St or, alternatively, access the commuter rail services at Hazelhatch & Celbridge rail station within 4km of the proposed development.

5.2 The key bus routes in the area are identified in Table 1 below, together with their advertised timetabled frequencies.

Route	Origin	Destination	Peak Frequency (mins)
68/A	Newcastle/Greenoge Business Park	Dublin City Centre	30/45
68X	Newcastle/Greenoge Business Park	Dublin City Centre	Single peak trip @ 07.30

Table 1. Routes serving subject site in Newcastle, Co Dublin.

Two Dublin Bus-operated bus routes serve Newcastle. Route 68/A primarily operates from Greenoge Business Park immediately to the southwest of the village. It operates along Main St, adjacent to the subject site, and then runs via Peamount on the R120 before routing to Clondalkin and into the City Centre along the South Circular Road alignment. The “A” variant of this service only operates over a short section of the route between Bulfin Road, in Inchicore, and Dublin city centre. The variant has a small number of morning and late afternoon trips but cannot be taken into consideration here given its distance from the subject site. The Express route 68X is a single peak hour trip in the morning peak that supplements the parent route. The timetables of both are coordinated

from Greenoge, in keeping with good industry practice. The 68X also operates from the nearby Greenoge Business Park but takes on a more direct routing to the city centre via the Naas Road. It has no evening, equivalent service. Patronage on the Newcastle bus service was surveyed on Wednesday May 18, 2022. The survey results are outlined in section 6.

5.3 The current rail services available to residents of Newcastle are attractive in many respects. Hazelhatch & Celbridge Station is very accessible from the subject site and is reachable by car in 6 minutes. The current level of service available to Dublin-bound users between 07.00 and 09.00 on each weekday is outlined in Table 2 below.

Train Time	Service Type	Destination	Journey Time (mins)
7.15	Commuter	Heuston Station	18
7.19	Commuter	Grand Canal Dock	43
7.27	Intercity	Heuston Station	17
7.33	Commuter	Heuston Station	15
7.37	Commuter	Grand Canal Dock	46
7.53	Commuter	Heuston Station	23
8.04	Commuter	Heuston Station	20
8.17	Commuter	Grand Canal Dock	45
8.30	Commuter	Heuston Station	19
8.35	Commuter	Grand Canal Dock	47

Table 2. Peak Dublin-bound Rail Services from Hazelhatch & Celbridge Station.

The attraction of the high level of service, with trains at an average of less than 10 minutes (post 07.15) in the morning peak, is obvious. The busiest destinations include Heuston and Pearse St, with the service offering direct access to wide areas of Dublin's CBD as well as onward links via the DART, LUAS and Dublin bus routes with many other destinations. The journey times, while somewhat variable depending on the number of intermediate stops, are considerably faster and more predictable than equivalent car or bus journeys undertaken in this time period. The trip time to Heuston averaged under 19

minutes. The journey time equivalent to Grand Canal Dock was 45 minutes, but lower for Connolly, Tara St and Pearse Stations.

Hazelhatch & Celbridge Station also benefits from extensive, paid car parking. There are currently 228 car spaces (including 20 disabled parking spaces) available to commuters. The car parking charge regime on offer yields deep discounts for regular users. Managed by APCOA on behalf of Irish Rail, the cash payments are €4.50 per day (€3.50 via APCOA App) but fall to as little as €9 per week and €30 per month. A total of 30 sheltered bike spaces and 10 bike lockers are also available to commuters. As outlined in 4.2 earlier, the station now benefits from two recently introduced BusConnects Local bus routes - L58 and L59 - which are operated by Dublin Bus and each serve the station every 30 minutes over the bulk of each weekday and also have attractive weekend frequencies. These routes link Leixlip, Celbridge and intermediate areas eastwards to the station. Newcastle, roughly 4km to the east, has, as yet, no corresponding bus service to connect with rail services at Hazelhatch.

5.4 In modelling the behaviour of travellers, whether by car, bus or rail, traffic engineers and transport economists use the concept of “generalised cost” which uses the “value of time” in broadly determining modal split (or between competing routes). The modellers break down the components of alternative possible trips into their constituent parts. Simplistically, in this example, it breaks down the bus/rail trip into four basic time components. In this instance,

- Firstly, the walk time to the target bus stop/station.
- Secondly, the wait time for the bus/train.
- Thirdly, the duration of the public transport journey itself and,
- Finally, the walk time to the work or school destination from the bus stop or destination station.

The impacts of fares, etc. are ignored in this brief outline. Each element of the bus or rail trip is assigned different weightings, depending on their relative attractiveness.

While there can be some debate over the values of these weightings, extensive research has shown that travellers generally dislike both the walking and waiting elements of the journey more than the in-vehicle journey time. (Hence the underlying attraction of car use where both of these elements are near zero and within one's control). On this basis, the walk element, being relatively unattractive, is usually assigned a value greater than 1. The weighting assigned to waiting for buses typically has a higher value, normally 2 or greater. This reflects the degree of relative discomfort or uncertainty associated with the unknown arrival time of the bus. The weighting value of the actual bus trip itself is closer to 1 if it has a very predictable and repetitive journey time. The value of any equivalent rail weightings for both the waiting component and journey time are typically somewhat lower due to their greater general predictability, especially given the near certainty around the rail journey time.

5.5 One outcome of this modelling based on behavioural research conducted over decades is that the trade-offs that travellers use in determining what mode they use can be assessed. In the case of future residents at the subject site in Newcastle heading towards Dublin they essentially have a binary choice if deciding to commute by public transport. On the one hand, they can board the existing route 68 or 68X (its peak only, more direct variant) and alight at the point closest to their ultimate destination. They could interchange to the LUAS service at Kylemore (or alternative stops) to increase the destinations options open to them. In this instance, the average walk time to bus stop 3403 (on Main St, Newcastle) at approximately 500m or 6 minutes is relatively short. The bus frequency is relatively limited as we have seen from Table 1 above in 5.1. In this instance regular commuters will tend to target a specific bus to get them to their destination at the appointed time using travel Apps that track buses in real-time. The alignment of route 68, for much of the early parts of its routing, does not benefit from extensive bus lane priority, which causes some uncertainty around journey time. The generalised cost weightings in these circumstances will tend to be relatively high and limit the overall attractiveness of the bus service.

5.6 On the other hand, future residents of the Newcastle site have the quite attractive option of a commute by rail. As outlined above in 5.3, Hazelhatch & Celbridge station has a frequent and fast rail commuter service to either Heuston or Pearse/Grand Canal Dock stations. While it does require getting to the local station (most likely currently as a car driver or passenger) the service on offer is attractive. As we have also seen in 5.3 there is more than adequate Park & Ride car and bicycle spaces available to commuters in Hazelhatch. Journey time from residence to boarding of the train is likely to be of the order of 10 minutes (car journey of 6 minutes). The reliable journey times by rail, and its low generalised cost, will draw many future residents to rail services. The relative attraction of bus and rail services with the planned Bus Connects and the DART+ proposals for the area is discussed after the current demand for these services is examined.

6. Public Transport Capacity Assessment.

6.1 The main objective of this analysis is to determine whether or not the incremental demand for public transport generated by the development of the subject site will put the existing bus services in Newcastle under undue pressure. Surveys of existing (May 2022) bus patronage have been undertaken. An appropriate share of the newly generated patronage from the new development, as determined by the DBFL Consulting Engineers TTA, will be added to these surveyed levels of bus usage. On that basis the impact on public transport capacity can be assessed. The current demand for rail travel from the nearby Hazelhatch & Celbridge Station is also a key element of this assessment.

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

- Demand for bus and rail services, in general, is materially lower in 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 none-holiday weeks in the opening four or five months of the year, and early Autumn, represent 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) are materially lower than mid-week demand.
- Demand for travel varies throughout the standard weekday but the morning peak is shorter but usage levels higher than the corresponding evening peak flows.

6.3 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 prior to the Summer period when schools are open. This advice was strictly followed in the surveys undertaken for this report.

Bus Survey on Main St, Newcastle, Co Dublin.

6.4 Given the location of the subject site and the proposed good quality permeability to/from the site Stop 3403 on Main St, Newcastle, the high profile and closest stop in the village to the planned development was chosen as the location for the bus patronage survey. In keeping with the demand profile for bus travel outlined in 6.2 above the survey was undertaken between 06.30 and 08.30 on Wednesday, May 18, 2022. This is well in advance of any school closures and major annual leave periods. Details of the survey are now outlined.

6.5 Table 3 below shows the passenger demand profile by time band of the survey data for the morning peak in question.

Timeband	Bus Numbers	Passengers	Passengers/Bus
06.30 - 07.00	1	12	12
07.01 - 07.30	1	14	14
07.31 - 08.00	2	37	19
08.01 - 08.30	0	0	30
Total	4	63	16

Table 3. Passengers on scheduled buses at Stop 3403 (Main St, Newcastle, Co Dublin)

Table 3 above illustrates the two key aspects of the current demand for the existing bus service out of Newcastle in the AM peak. Firstly, the level of service is quite limited. Only four buses (inbound towards Dublin) were observed in the survey period. This is entirely in keeping with the publicised Dublin Bus timetable. No scheduled bus is available to commuters in the period 08.00 to 09.00. Secondly, the level of patronage, albeit relatively early in the route, is low to moderate at this point in time.

6.6 In marked contrast to many busy suburban bus corridors the development of Newcastle village has only gathered pace in recent years. The bus service available to bus patrons is still quite limited. Route 68, and its express variant 68X, are the only services available to Dublin-bound commuters.

In summary, the survey showed that

- Only 63 passengers in total were on buses at bus stop 3403 in the heart of Newcastle over the AM peak survey period.
- Numbers boarding at stop 3403 itself for each of the scheduled buses were in small single digits throughout. The next bus stop, stop 3404 on Seamount Road had fewer passengers waiting.
- All four scheduled buses (three on route 68, the fourth of route 68X) expected over this time period were captured at the survey location.
- The demand, low as it was, was reasonably well spread over the survey period.
- The buses appeared, in their time of arrival, to operate very much to schedule throughout the survey period. Their schedules were clearly co-ordinated by Dublin Bus with the sole 68X slotting into a gap in the parent route timetable.
- The average number of passengers per bus was quite low at 16, peaking at just over 20 in the busier 07.30 - 08.00 time band.
- Passengers were observed arriving at the stop within minutes of the scheduled time for the bus. Usage of real-time apps is now commonplace, especially among younger passengers. This enables them to time their arrivals to minutes in advance of the approaching buses. And thereby reduce the “waiting” element of their journey’s generalised cost.
- It is noteworthy that the busiest time at bus stop 3043 was when 21 schoolchildren boarded a Dualway operated school bus at 07.58 from this stop. The school bus was observed heading west towards Celbridge. This school bus is NOT included in table 2 above.
- Observations of buses heading outbound towards the terminus at Greenoge Business Park indicated that some of these buses were at least as busy, in this area, as their inbound equivalents. This suggests that employees starting before

08.00 in the nearby business park are a feature of the route. Contra-peak bus passenger flows to business parks are not uncommon in some areas of the city.

6.7 The busiest time band, in terms of passengers loadings on departing buses from this stop, had only 37 passengers and occurred between 07.31 and 08.00. Table 4 below presents the same survey data, but on a route basis. On the assumption of 67 seats per double deck bus, this table identifies the actual spare capacity by route. Bus capacity for the purposes of this analysis is taken, conservatively, as the seated capacity only, which understates the ultimate true capacity of buses by roughly 20%. But passengers would not be expected to stand for a protracted period of time.

Route Number	Bus Numbers	Passengers	Passengers/Buses	Spare Capacity %
68/A	3	47	16	76
68X	1	16	16	76
Total	4	63	16	76

Table 4. Passenger and Spare Capacity by Route (Stop 3043, Main St, Newcastle)

Buses leaving this stop in this time band still have plenty of spare capacity with only 16 passengers per bus and will have delivered their customers to city centre destinations well in advance of any 09.00 start. The level of spare capacity for the regular scheduled and express services are identical, based on the survey data. The impact of Covid-19 is evident in this part of the bus network (as it elsewhere) with volumes below “normal” levels experienced before March 2020. This is generally true of the whole Dublin bus network. From Table 4 it is obvious that there are somewhat higher levels of spare capacity currently here. From a bus operator’s perspective many of these buses would be viewed as under-utilised at this point in the route, especially during peak period, but it must be recognised that they still have to operate over the bulk of the route towards the city. One would have anticipated that the patronage on the faster route to the city would

be busier at this point in the network. But the alignment on route 68X is somewhat different in its approach to the city centre than the parent route 68/A. (the “A” variant only operates a short route between Bulfin Road in Inchicore and the city centre and can be ignored here).

Spare Capacity after Generated Trips

6.8 In assessing the impact of estimated generated trips from the proposed Newcastle SHD development on the public transport network this section of the report has drawn extensively on the work done by DBFL Consulting Engineers in their Transport and Travel Assessment (TTA) for the subject site. DBFL analysed the Census 2016 journey from home to work, and school/college data for the areas highlighted below in Figure 3 (from the TTA Figure 5.1).



Figure 5.1: Residential Areas of Interest for Trend Analysis

Figure 3. Areas of Newcastle analysed using Census 2016 data. (Source DBFL TTA).

Analysis of the Census data by DBFL showed that

- only 8.4% of residents in 2016 travelled to work by public transport. This was split 5.0% by bus and 3.4% by rail.
- The use of public transport was higher for those accessing education at 13.0% with bus accounting for 12.4% and rail just 0.6%
- In marked contrast, 75.8% travelled to work as a car driver while 51.6% travelled to school/college as a car passenger.

6.9 The DBFL analysis also used the established procedure of determining TRICS data from analysing a series of similar residential areas. This data is in Tables 5.3 and 5.4 of the DBFL TTA. The detailed TRICS assessment (which generates vehicle data) and Census 2016 modal share analysis (which yielded the share using cars), when combined, indicate the number of generated trips per mode in table 5 below:

Mode of Travel	Average Mode Share	AM Peak Hour Departures
Car Driver	51.6	53
Car Passenger	20.1	21
Walking	11.0	11
Bus, minibus, coach	7.4	8
Van	4.9	5
Train, DART, LUAS	2.5	3
Bicycle	1.8	2
Motorcycle/Scooter	0.6	1
TOTAL	100%	104

Table 5. Anticipated AM Peak Departures Generated Trips, by Mode, 2024, (Source DBFL TTA).

6.10 Table 6 below summarises the impact on current bus patronage of the modal split assumptions for the proposed Newcastle development. In the May 2022 survey the peak hour in terms of bus patronage was between 07.01 and 08.00, as seen in Table 3 above. In this hour 51 passengers boarded at the Main St stop (3403).

Year	Current Peak Hour Passengers	Generated Bus Trips	Future Peak Hour BusTrips	Increase in Peak Hour Trips %
2022	51			-
2024	51	8	59	15.7

Table 6. Impact of site generated bus trips on current peak volumes.

In Table 6 the surveyed AM peak hour passenger numbers on buses in Newcastle Main St are increased by the anticipated generated bus trips using the modal split assumptions based on DBFL’s modelling work. The generated AM peak hour trips for the development results in 8 additional bus passengers as outlined in Table 5. While this represents a 15.7% increase on current peak hour surveyed passengers of 51, the existing average level of spare capacity at 76% (from Table 4) is not challenged. Even in the busiest 30 minute period (the peak within the peak) the average passengers per bus did not exceed 19. Even if all the generated trips occurred in this narrow time band this still leaves spare booth trips with seated capacity of 66% for a 67 seater bus. So the current level of spare seated capacity would cater for this increase even during the busiest period in the AM peak hour.

While other new scheme build-outs will occur over this period (as outlined in some detail in section 5.4.2 of DBFL’s TTA) the largest of these sites (Site 6 - Graydon residential Development) has already been completed and therefore captured in the recent bus survey. The impact of all sites is seen as being easily handled given the level of spare capacity identified above. The 20% extra capacity associated with a full bus, including standees, is also available to commuters. In addition, the NTA, under its Measure Bus5 process, will also continue to monitor and enhance bus services as required to meet

demand (see 7.4 below). But one cannot envisage this arising in the case of the Newcastle services in the medium term.

6.11 The analysis above demonstrates that there are significant levels of spare capacity on the current bus network in the immediate area of the subject site as clearly demonstrated by the bus usage survey undertaken for this report. It should be noted that the public transport modal split volumes in Table 5 above are based on the current network of bus services. As will be seen later, a whole series of new opportunities will soon arise for public transport users to access many other areas of the city bus and rail network. The BusConnects project, as it directly applies to the Newcastle area, is described in section 7.

Current Demand for Rail Services from Hazelhatch & Celbridge.

6.12 The current level of commuter rail travel is only operating at around 60-65% of “historic” or pre-Covid-19 levels. Of all the various public transport modes and sectors, commuter rail (including the DART services) has lagged the most in its recovery. To get a true reflection of the underlying demand for travel from this station the most reliable source is the NTA’s annual “National Rail Census Report”. The 2019 Census, released in July 2020, identifies the following trend in demand from Hazelhatch Station prior to any pandemic impact. Table 7 below showed the scale of growth of daily passenger demand for rail services at this station.

Year	Daily Passenger Boardings	Increase on Previous Year	% increase
2013	260	-	
2014	270	10	3.4
2015	271	1	0
2016	299	28	10.3
2017	497	198	66.2
2018	769	272	54.7
2019	969	200	26.0

Table 7. Source - Appendix A, P41 of National Rail Census Report, 2019, NTA, July 2020.

6.13 From a relatively low base and poorly performing economy nearly a decade ago, the scale of growth in daily boardings at Hazelhatch station has been dramatic in recent years (pre-pandemic). From near stagnation between 2013 and 2015, while the economy struggled, the demand from commuters quickly grew with rail passenger numbers here more than trebling between 2016 and 2019. These numbers make it one of the busiest and fastest growing in the whole southwest commuter corridor serving Dublin. While there is no recent equivalent data a reduction of, say, one third is likely based on the overall demand profile for Commuter rail travel. A count of occupied car parking spaces in mid-May 2022 showed that 123 of the 228 available to commuters were busy in the early afternoon on a midweek day. This equates to 54% occupancy of spaces. Some element of car-sharing amongst travellers would indicate that, perhaps, roughly 30-40% of rail users travel by car. Access by bus to Hazelhatch from Celbridge has improved beyond measure with the new L58 and L59 routes expanding the catchment area northwest of the rail station in the last year. But it is too early to measure the impact of these new BusConnects local routes on patterns to/from the station with any confidence. Recent fare changes will also actively encourage bus/rail interchange here. Pandemic impact or not, it is clear that there is lots of potential remaining in the rail services to meet the growing commuter needs of both existing and future residents of its wide catchment area, including the area around the subject site. The NTA's major DART+ plans for the upgrade of Commuter rail services for Dublin is discussed in detail. This report will outline how the DART+ South West proposals in particular directly impact on this area in section 8 below.

7. Future Bus Connects Network in Newcastle area.

7.1 Figure below shows the proposed Bus Connects network for the subject area. It is extracted from the NTA's most recently revised "Big Picture Network" following rounds of public consultation and revision. The NTA proposals, in summary, are for additional bus services to serve the wider Newcastle area.

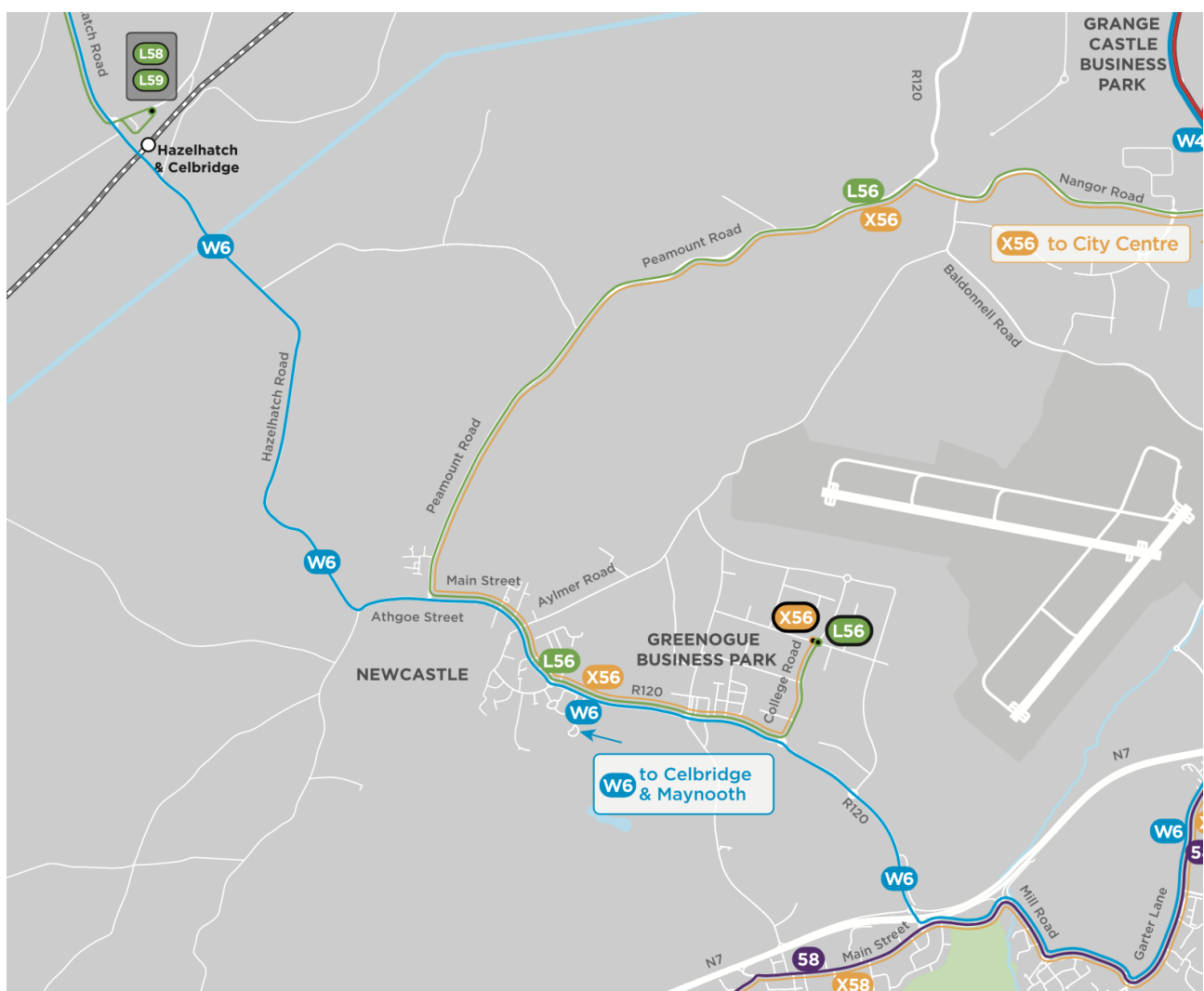


Figure 4. Extract from the NTA's Big Picture Network (latest version).

7.2 The NTA proposals for the immediate Newcastle area are for a combination of the old and the new in terms of bus routes. The route proposals together with the latest NTA Bus Connects Frequency Table that accompany the network shows three services forming the basis for the bus network in the area. The comparison of existing versus proposed routes is best summarised in Table 8 below.

Existing Route	Current Frequency (mins)	Bus Connects Replacement	Frequency (mins)
68/A	30/45	L56	60
68X	Single AM Trip	X56	1 Trip AM/PM
-	-	W6	30

Table 8. Comparison of existing and proposed Bus Connects routes for Newcastle area.

The key highlight in Table 8 is the addition of route W6 into the bus network. One of the key outputs of the BusConnects project is a new orbital bus network for the Greater Dublin Area. It is composed of

- An inner city orbital (route 0) around Dublin City centre (e.g along the Grand Canal to the south)
- A network of four northern orbital (N2 then N4, N6 and N8 respectively as one heads north away from the city centre). The latest BusConnects phase has seen the implementation of the first of the new orbital routes - N4 and N6 - in late May, 2022.
- A corresponding network of four southern orbital (S2 then S4, S6 and S8 heading southwards)
- A network of three western orbital (W2 then W4 and W6 as one heads west from Dublin)

These orbital services interchange with each other at various points in the network. In this way more complex orbital movements can be undertaken if required. As well as linking with other orbitals these routes clearly interchange with many of the major Spine as they

cross the CBC's outlined above. They also link with many radial (R) and local (L) routes in the new BusConnects scheme. Crucially, they also interchange with a multiplicity of rail stations. Alterations to the fare system encourage greater interchange.

7.3 Route **W6**, the outermost of the new western orbitals is a new bus alignment well to the west of much of the built-up area of the GDA that passes in close proximity to the subject site. This route, which will be operated by Go-Ahead after they were successful in a recent NTA tender for routes W4 and W6, is planned to commence operation in Q1, 2023. The planned frequency is attractive at a bus every 30 minutes in each direction. Importantly, that frequency is maintained from 06.00 each weekday throughout the day until near midnight. This solid frequency is then repeated over the bulk of the day for both Saturdays and Sundays. Some of the features of the new BusConnects routes include much earlier morning starts and weekend frequencies comparable with their weekday equivalents. The route at one end starts in the Moyglare Road area to the west of Maynooth. It then operates in a south eastern direction via Maynooth, Celbridge, Newcastle, Rathcoole, Saggart and through much of west Tallaght before terminating at The Square in Tallaght. It interchanges with commuter rail services at both Maynooth and Hazelhatch & Celbridge stations. It traverses the LUAS Saggart alignment at Citywest and terminates adjacent to the LUAS Red Line terminus in Tallaght. It also intersects with a variety of "Spine" routes including the C3 and C4 in Maynooth and Celbridge and the D2 and D4 in Tallaght. Crucially, it provides a planned strong link between the subject site and Hazelhatch station in one direction and The LUAS in West Tallaght in the other. These links expand the attractive bus/rail interchange options to residents of Newcastle.

7.4 From Table 8 one can see that the planned bus service replacements for routes 68/A and 68X do not have the same level of service as the W6. **Route L56** will operate on an hourly basis. But other key changes are afoot. Route L56, the direct replacement for the 68/A, will only operate as far as The Red Cow LUAS Interchange. This means that the route from Newcastle changes from a radial to a local route, in BusConnects parlance. Because of this change passengers wishing to access the city centre will be obliged to interchange at the Red Cow station onto the LUAS or earlier to one of the "Spine" routes or radial. The planned frequency, at a bus every hour, repeats the current non-peak

frequency but represents a slight reduction in the peaks. **Route X56** is cited as a direct replacement for route 68X in the BusConnects project but it does now include a return or evening peak express service not currently available to residents of Newcastle. These routes, in combination, offer residents from Newcastle broadly similar levels of service in the future but requiring those city bound on the main route to interchange at some point, most likely to LUAS services at the Red Cow Stop. Many could find the need to transfer to another mode annoying, but recent fare changes with both free interchange (within time limits) and an overall 20% fare reduction will prove attractive for many commuters.

7.5 The combination of both transport and climate policy will continue to drive public transport's share of commuter traffic into and out of Dublin higher. The NTA's Greater Dublin Area Strategy 2022-2042 clearly indicates that "demand for bus services in 2042 would require routes additional to those set out in the network review" (BusConnects). It proposes that "periodic reviews will be undertaken during the period of the Transport Strategy to evaluate the impacts of changing development and transport patterns, and to implement appropriate additions or adjustments to the overall bus system to accommodate the changing arrangements". This forms the basis for what is termed "Measure Bus5" to continually monitor the bus network and enhance or amend it accordingly. The BusConnects project, now underway, together with the assurances of Measure Bus5, when combined with the enhanced CBCs represent as good a guarantee of high quality bus services for the Dublin area as anyone could expect. This assurance applies to all routes, large and small. If, for example, demand for the likes of orbital route W6 grows appreciably following the introduction of the service, then the route, or easily identifiable sections of it, will increase in frequency.

7.6 From Figure 3 above we see that other routes are planned in relatively close proximity to the subject site. Specifically, routes L58 and L59 operate from Leixlip and Celbridge and Hazelhatch rail station. The introduction of these new routes last year highlight the level of importance that the NTA attaches to the need to develop the level of bus/rail interchange in this area. The Census 2016 data discussed above shows that more current residents in Newcastle travel by rail than by bus from this area to work, school and college. The plan for W6 will significantly boost the interchange opportunities for

Newcastle residents. They will no longer be obliged to drive and Park & Ride at Hazelhatch station. The NTA's investment in route W6 to encourage bus/rail interchange also reflects the significant plans in progress to upgrade the Dublin Commuter rail network. The so-called DART+ project for the Dublin rail network directly impacts the area under study with the proposed DART+ South West scheme. Its ability to transform the level of service by rail from this area suggests that it is probably a more significant project for the subject site than BusConnects ever will. The DART+ South West plan is now outlined in the next section.

8. DART+ South West Proposals.

8.1 The first element of the DART+ project promoted as part of the Project Ireland 2040 investment plan and the NTA's Transport Strategy for the Greater Dublin Area (2016-2035) is DART+ South West. Other alignments will follow on from this. The extent of the alignment of the project is shown in Figure 4 below:



Figure 4. DART+ South West. Hazelhatch to Heuston. (Source, Irish Rail DART+ website)

The section of the rail line shown in brown indicates the extent of the electrification works. The project includes the electrification of the Phoenix Park Tunnel where it links in with DART+ West. The project extends to Hazelhatch & Celbridge Station, the most westerly station to be electrified.

8.2 The trends from NTA National (Heavy) Rail Census Report (July, 2020) indicate growing use of the Commuter Rail services into and out of Dublin. While both Intercity and DART services also show growth the outperforming Commuter trends stand out. This is especially true for these services on the Kildare (Heuston) Line, which includes Hazelhatch Station. The figures in Table 20, P35 of the NTA report mirror those for Hazelhatch shown in table 7 above. They also reflect the trend towards greater rail commuter traffic, aided by the re-opened rail link to Grand Canal Dock via the Phoenix Park Tunnel.

8.3 Also benefitting from sufficient car parking capacity at the station, Hazelhatch is viewed as the focal point for the proposed DART+ South West service. The proposals for here are currently in the public consultation process. Following this the scheme is expected to be lodged with ABP by year end (2022) with an ambitious 2026 project delivery date. Electrification of the line as far as Hazelhatch & Celbridge station is the key design feature. In this way, Hazelhatch becomes the terminus for the extended DART service with frequency into Dublin expected to double when operational. The impact on rail commuting will be transformational in areas like Newcastle and Celbridge, such is the scale of service upgrade anticipated. The recent and planned bus network changes for the area are consistent with a move towards more bus/rail interchange at Hazelhatch.

8.4 Being planned and funded by both the NTA and Irish Rail, the main benefits of DART+ South West are seen by the promoters as

- Increasing peak passenger capacity from 5,000 to 20,000 per hour per direction and an increased train frequency between Hazelhatch & Celbridge Station and Dublin City which will facilitate fast, frequent and reliable transport for surrounding communities.
- Facilitating the development and future growth of existing and new communities that will greatly benefit from the connectivity that the DART+ South West will deliver.
- Building a sustainable and connected city region, supporting the transition to a low carbon and climate resilient society.
- Facilitating people to make sustainable travel choices by encouraging a move away from private cars to a reliable, efficient and safe public transport network.
- Enhancing public transport opportunities for work, education or leisure purposes.
- Improving multimodal transport connectivity through interchange with the LUAS at Heuston Station, Bus Connects and the proposed MetroLink.
- Improve journey time reliability.

- Alleviate road congestion.

8.5 While the electrification projects will take some years to implement, much of the work in the Hazelhatch section of the route has already been completed. These extensive works were carried out in advance by Irish Rail under the original Kildare Route Project between 2006 and 2009. These civil engineering works provided the main groundwork for DART+ South West Project, including the installation of the four-track section and the upgrade or replacement of several structures on this section of the route, including ten road over-bridges and footbridges. This means that the electrification works can be run under the existing bridges with no/minimal intervention to the bridge structures.

8.6 The combination of the new interchange opportunities with route W6 and the major upgrade in rail services with the DART extension to Hazelhatch & Celbridge station will likely materially transform the modal split from the subject site in keeping with the modal split objectives set out by the NTA in their GDA Transport Strategy for the Greater Dublin Area (2016-2035).

9. Conclusions.

This assessment of the existing Newcastle bus network, the spare capacity currently on these routes, the scale of rail travel from Hazelhatch station together with the planned BusConnects routings and DART+ South West project lead to the following key conclusions.

1. There are significant levels of spare capacity on the current bus network in the immediate area of the subject site, as shown by the bus stop surveys undertaken for this report.
2. The Census 2016 data shows the relatively strong attraction to commuting by rail from this area.
3. The NTA's BusConnects project proposals include an attractive new orbital route of direct benefit to the development. This will radically enhance orbital connectivity to neighbouring urban centres and rail and LUAS services.
4. The completion of the DART+ South West project will transform rail commuting options in this area, greatly reducing the journey time to Dublin's CBD.
5. The Newcastle South SHD site is well positioned to benefit from the proposed Bus Connects and DART+ public transport network.
6. The combination of a new bus link on route W6 to Hazelhatch station and much improved DART frequencies and speeds will strongly support the case for strong growth in rail commuting from the subject site in Newcastle.