

Cherrywood Strategic Development Zone

Parking Advice

Technical Note

Client: Dun Laoghaire- Rathdown County Council
November 2018

Quality information

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1. Introduction

AECOM were commissioned by Dun Laoghaire-Rathdown County Council (DLRCC) to undertake a review of the proposed parking facilities within the Cherrywood Strategic Development Zone (SDZ), with a view to providing technical advice on whether any intervention is required to bring the development in line with recently published guidelines i.e. Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities published by the Department of Housing, Planning and Local Government, March 2018.

2. Context

The context to which the parking within the Cherrywood development is being assessed is set out below. Any update will need to take cognisance of the *Dun Laoghaire - Rathdown County Development Plan 2016 – 2022* and the *Sustainable Urban Housing: Design Standards for New Apartments* documents. Currently, the parking guidelines for Cherrywood provide for a lesser quantum of parking spaces when compared to the DLRCC Development Plan.

Dun Laoghaire - Rathdown County Development Plan 2016 - 2022

Car parking standards are detailed in the Development Plan within Paragraph 8.2.4.5 and Table 8.2.3 as shown on Table 2-1 below. Further guidance pertaining to the provision of parking is also stated in Paragraph 8.2.4.5 which states:

"The Planning Authority may require the maximum number of car parking spaces specified in Tables 8.2.3.....to be further reduced where it is considered that the surrounding road network is not sufficient to cater for the volume of traffic likely to be generated by the proposed development."

Table 2-1: Car Parking Standards

Table 8.2.3: Residential Land Use - Car Parking Standards	
Land use	Standards
Residential Dwelling	1 space per 1-bed unit and per 2-bed unit 2 spaces per 3-bed unit+ (depending on design and location).
Apartments, Flats, Sheltered housing	1 space per 1-bed unit 1.5 spaces per 2-bed unit 2 spaces per 3-bed unit+ (depending on design and location)

Source: Dun Laoghaire - Rathdown County Development Plan 2016 - 2022

Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities, Dept. of Housing, Planning and Local Government, March 2018

Guidance in relation to the provision of car parking in proposed apartment developments can be found in several paragraphs within the document such as Para 4.18 which states: *"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"*

Given the presence of Luas and its location 15km from the city centre it is considered that Cherrywood fits into the 'Intermediate Urban Location' criteria. In relation to these areas the

guidelines state that *"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"*. It should be noted however that some aspects of the Cherrywood development, namely its distance from the city centre, may also fit within the 'peripheral and/or less accessible urban locations' criteria which sets out higher guidelines for parking provision.

The guidelines go on to state that *"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, 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"*.

Proposed underground car parking in the retail areas of the development are referenced in paragraph 4.25 of the document which states that *"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."*

3. Ireland and UK Best Practice

A review of practices in Ireland and UK has been undertaken to inform this note as set out below. The examples shown below are indicative of parking practises in cities throughout Ireland and the UK and provide good insight into measures being taken elsewhere in relation to parking guidelines.

Fingal

Fingal County Council has defined parking standards for new developments. Fingal is divided itself to two zones, of which Zone 1 has a good public transport service and planned development of Luas/Dart/Metro/Rail. Zone 2 is less connected to Dublin city in transport terms. Parking space provision proposed by Fingal varies by type of development: 1-2 parking spaces recommended for houses with 1 or 2 bedrooms, 2 parking spaces for houses with 3 or more bedrooms. The number of parking spaces for apartments is defined as: 1 for 1 bedroom apartment, 1.5 for 2 bedroom and 2 for apartments with 3 or more bedrooms. There is the third group for rural houses for which the guidelines suggest 3 parking spaces per dwelling.

South Dublin

South Dublin County Councils stated policy is to carefully consider the number of parking spaces needed to serve each proposed development. Also, one of the main objectives for planning car parking is to ensure that it does not detract from the comfort and safety of pedestrians and cyclists or the attractiveness of the landscape. South Dublin in its development plan for 2016-2022 also takes into consideration the provision of charging infrastructure for electric vehicles. The policy states that to facilitate the use of electrically operated cars and bicycles in line with National Policy, all developments shall provide facilities for the charging of battery operated cars at a rate of up to 10% of the total car parking spaces. Parking space provision is dependent on the zone in which it is located and type of development (apartments or houses) contained within the zone. For Zone 1 the standards are: 1 space per 1-bed apartment or house, 1.25 space for 2 bed apartment, 1.5 space per 3+ bed apartment or 2 bed house and 2 spaces per house with 3 or more bedrooms. In Zone 2 these numbers are lower: 0.75 parking space per 1 bed apartment,

1 space per 2 bed apartment or 1 bed house, 1.25 space per 3+ bed apartment or 2 bedroom house, 1.5 space per house with 3 or more bedrooms. The number of spaces provided for any particular development should not exceed the maximum provision. These guidelines were also applied for Clonburris SDZ. Clonburris SDZ states that *"the standards are maximum parking standards and should not be viewed as a target."* The Clonburris SDZ also allows for the development of car free housing in the higher density areas of the SDZ lands adjacent to Public Transport interchanges and within the urban centres planned around the Clondalkin-Fonthill and Kishoge rail stations.

Bath - England

As a similar intermediate urban location in terms of distance from Bristol to Bath and commuter links between the two locations, Bath is a comparable study location. In 2015 Bath & North East Somerset Council revised their car parking standards for developments in their district with a view to moving from maximum to minimum parking standards and have based a strategy on an inner zone and an outer zone. The inner city centre zone has excellent transport links that include bus and rail connections as well as road links with the nearby city of Bristol. For all residential development of any size in Bath City Centre, the parking standard is 0.5 spaces per dwelling based on the 2011 census figures. This reflects that's any residential development within the zone is within easy reach of key services/ facilities and additional core parking is not feasible because of existing infrastructure space being scarce. No additional non-residential parking is permitted under B1 use as there is zero provision possible due to the city centre being a world heritage site.

Parking in the outer residential zone is arranged as follows:

- A minimum of 1 space per 1 bed dwelling
- A minimum of 2 spaces per 2-3 bed dwelling
- minimum of 3 spaces per 4+ bed dwelling
- minimum of 0.2 spaces per visitor
- Garages are included within the prescribed minimum standard provided they have a minimum internal dimension of 6m x 3m

For all non-residential developments outside of the city centre in the residential zone, maximum parking standards are used on an individual basis.

Cork City

Cork is the second largest city in the Republic of Ireland. Current parking standards suggest no more than 1 parking space per unit (either house or apartment) in suburban areas. Parking standards recommend locating parking in basement levels for apartment developments. Otherwise parking should be sited within established building lines and adequate landscaping and tree planting must be provided.

Cork County

In 2014 Cork County created a development plan to set out maximum parking requirements according to class usage. For the purpose of comparing residential use to other study examples within this document, the current minimum per sqm parking standards are as follows:

- Dwelling House - 2 spaces per dwelling
- Apartments – 1.25 spaces per apartment

- 5% of car parking spaces in non-residential areas shall be set aside for disabled car parking
- 10% of car parking spaces in non-residential areas shall be set aside for parent & child car parking
- Motorcycle parking is provided to meet the requirement of any development with spaces being provided on the basis of 1 motorcycle bay per 10 car parking spaces where it is convenient to building access points.
- 10% of the total car parking spaces in non-residential areas will be dedicated to EV (metered fast charging 220-240v, 32A 3 phase). EV points in residential areas are to be to a similar spec but using slow charging 13A single phase technology)

The above indicated figures cover both the Cork City North & South Environs as well as the rest of Cork. It is worth noting the acknowledgement of differing densities between Cork City & County through the difference in spaces per dwelling.

Within the guidance notes for parking standards, it is made clear that residential standards are minimum and can be exceeded at the discretion of the developer.

There is also notation to indicate that parking standards may be reduced if it can be satisfied that good public transport links already exist and or there is a high percentage of modal shift in favour of sustainable modes that will be achieved through the development

Belfast City

Belfast, the second largest city on the island of Ireland, has developed a parking strategy. The vision described in *Belfast Parking Strategy and Action Plan* states the importance of parking space in economic and social aspect. Another document, *Belfast Metropolitan Area Plan - Plan Strategy & Framework - Volume 1*, refers to decreasing the need for individual travel by maximising the potential of the existing transport network and supporting more sustainable transport modes. This is expected to result in reduction in car ownership and a reduction in the requirement for parking spaces. The same document states that the required number of parking spaces, in particular areas of the city, should not be higher than 1 parking space per dwelling in the city centre core and fringe and suburban areas. It recommends that car parking is not located on the surface but underground.

Liverpool City

Liverpool is a twin city of Dublin and has a little different approach to parking standards when it comes to requirements. According to released document '*Liverpool Report – Appendix B – DCP for Car Parking and Access*' the number of parking spaces per studio apartment or 2-bedroom apartment is 1 whilst 1.5 parking spaces are suggested for units consisting of 3 or more bedrooms. In addition to parking spaces for residents the number of parking spaces for visitors is defined as 1 space per 10 units. The city has set maximums for the number of parking spaces and encourages decreasing these numbers. Moreover, the city tends to apply charges for parking to discourage private car journeys.

Manchester City

Manchester's parking guidance (*Guide to Development in Manchester Supplementary Planning Document and Planning Guidance Adopted April 2007*) states that developers should start taking into their consideration pedestrians, cyclists and disabled people as a priority over car users. This statement means that besides car parking spaces an appropriate level of accessibility must be provided for all residents. Designated parking spaces, however, ought to be designed in

innovative and imaginative way. The city in released parking standards defines only numbers for non-residential areas. The Manchester Residential Quality Guidance suggests full provision of parking spaces although no number is specified.

Edinburgh City

The city of Edinburgh presents standards similar to those in Manchester. The main goal is to encourage residents to reduce the use of their private cars and sets out minimum as well as maximum numbers of parking spaces. However, the maximum is no more than one parking space per dwelling. Edinburgh's parking standards also promote cycling by increasing the number of spaces for bicycles and creating some for motorcycles although only in case of housing without individual garages or private rear gardens so residents could store their properties within their own spaces. The same document states that high quality public transport for sustainable development is fundamental. The policy of decreasing number of parking spaces is to encourage residents to make use of alternative forms of mobility such as car sharing, City Car Club etc, instead of having a private car. Nevertheless, lower parking standards need to be supported by parking controls, which help to enforce parking levels and restrict overspill and indiscriminate parking.

Inverclyde - Scotland

As a similar intermediate urban location to Dun Laoghaire, Inverclyde Council have set parking standards for new developments in line with SNRDG (Scottish National Roads Development Guide) and their own Local Development Plan TRA1, to manage development that would affect traffic flow on the strategic road network to prioritise and allow essential traffic to undertake efficient journeys. To achieve this, sustainable access through trip generation, safeguarding land identified for roads and parking as well as seeking developer contributions are considered. The public transport network is protected where possible, and support is given to proposals that will result in an improved or extended service. Where proposals could result in the requirement for new or diverted public transport routes, discussion with Strathclyde Partnership for Transport is undertaken.

The parking standards that Inverclyde follow are guidance set out in the Scottish national roads development guide, Roads Development Guide Part 3 sets out 11 standardised classes ranging from Shops (Class 1) to Class 11 (Assembly & Leisure) Including Sui Generis class. For comparison purposes to other locations within this study relating to new private development, the following standards apply:

- A minimum of 1 space per 1 bed dwelling based on spaces per 100m² gross floor area. This includes 1 secured covered cycle space per dwelling (No cycle space is required if a garage or other secured area is provided. There is no PTW min and a disabled space is not required if it's within the curtilage of the dwelling or is otherwise provided in a visitors/unallocated space.
- A minimum of 2 spaces per 2-3 bed dwelling based on spaces per 100m² gross floor area. This includes 1 secured covered cycle space per dwelling (No cycle space is required if a garage or other secured area is provided. There is no PTW min and a disabled space is not required if it's within the curtilage of the dwelling or is otherwise provided in a visitors/unallocated space.
- A minimum of 3 spaces per 4+ bed dwelling based on spaces per 100m² gross floor area. This includes 1 secured covered cycle space per dwelling (No cycle space is required if a garage or other secured area is provided. There is no PTW min and a disabled space is

not required if it's within the curtilage of the dwelling or is otherwise provided in a visitors/unallocated space.

- Retirement Developments require a minimum of 1 spaces per dwelling based on spaces per 100m² gross floor area. This includes 1 space per 8 units (visitors). The PTW min is set for 1 space + 1 per 20 car park spaces (for 1st 100 car spaces then 1 space per 30 car spaces over 100 car spaces. Disabled space is not required if it's within the curtilage of the dwelling or is otherwise provided in a visitors/unallocated space.
- Minimum of 0.2 spaces per visitor
- Garages are included within the prescribed minimum standard provided they have a min internal dimension of 6m x 3m

Public social housing is set as follows:

- **Private Sheltered Housing & Housing Association:** 0.2-0.5 spaces per dwelling + 0.3 spaces visitor parking per dwelling + 1 spaces per warden
- **Amenity Housing:** 0.5 spaces per dwelling + 0.3 spaces visitor parking per dwelling
- **Local Authority Sheltered Housing:** 0.25 spaces per dwelling + 1 spaces per warden
- **Visitor/Unallocated:** 0.25 spaces per dwelling (unallocated). No cycle minimum is required if a garage or other secured area is provided within the curtilage of the dwelling. 1 covered & secure space per dwelling in a communal area for residents plus 1 space per 8 dwellings for visitors is required. The PTW min is set for 1 space + 1 per 20 car park spaces (for 1st 100 car spaces then 1 space per 30 car spaces over 100 car spaces. Minimum disabled parking is set as 200 bays or less = 3 bays or 6% or total capacity, whichever is greater. Over 200 bays = 4 bays plus 4% of total capacity.

4. Car Ownership

To ensure parking guidelines take cognisance of car ownership trends it is important to understand the difference between car usage and car ownership. Data extracted from the 2016 Census was used to understand how car ownership has changed in recent years and how it varies by geographical data. The table shows that DLRCC has a high car ownership rate overall which is likely linked to the socio-economic demographics of residents and easy access to public transport. Comparing DLRCC (621 per 1000) to Co. Dublin (496 per 1000) highlights the significant difference within Dublin County.

Table 4-1: Car Ownership per 1,000 Adults

County	Car Ownership per 1,000 Adults (aged 17 and over)
Roscommon	645
Carlow	637
Wexford	635
Tipperary	622
DLRCC	621
Wicklow	620
Waterford	619
Clare	609
Kildare	603

County	Car Ownership per 1,000 Adults (aged 17 and over)
Westmeath	597
Cork	596
Kerry	594
Meath	583
Limerick	575
Kilkenny	570
Leitrim	566
Mayo	564
Offaly	560
Ireland	558
Galway	553
Sligo	551
Longford	545
Monaghan	538
Cavan	536
Laois	532
Donegal	524
Louth	522
Dublin	496

Historical car ownership data is presented in below which provides an overview of how car ownership rates have changed in recent decades and how, after a significant reduction during the economic downturn between 2008 – 2013, rates have been increasing again since 2013.

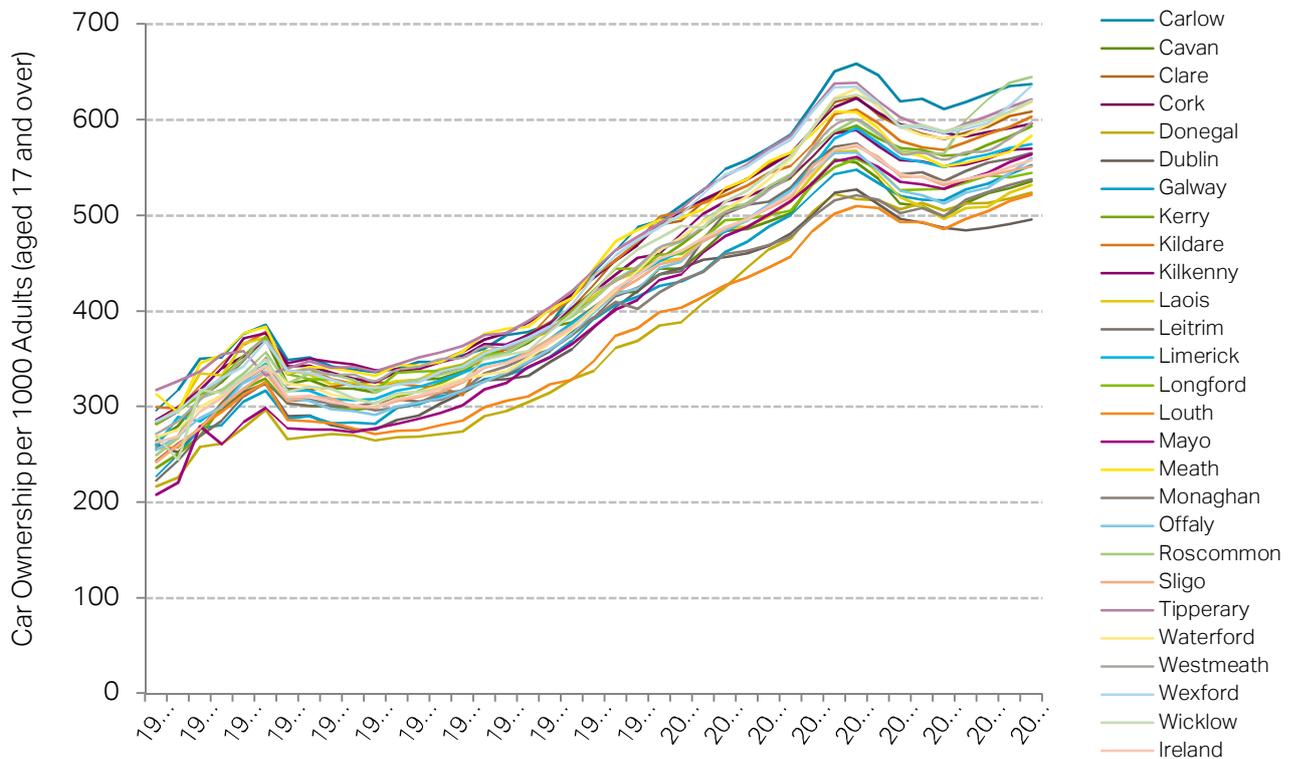


Figure 4.1: Historical Car Ownership Rates

To understand how car ownership varies throughout the DLRC area an analysis of car ownership rates has been undertaken based on data extracted from the 2016 Census. Figure 4.2 highlights the significant variation in car ownership rates which tends to increase based on distance from city centre, development density and/or lack of PT options.

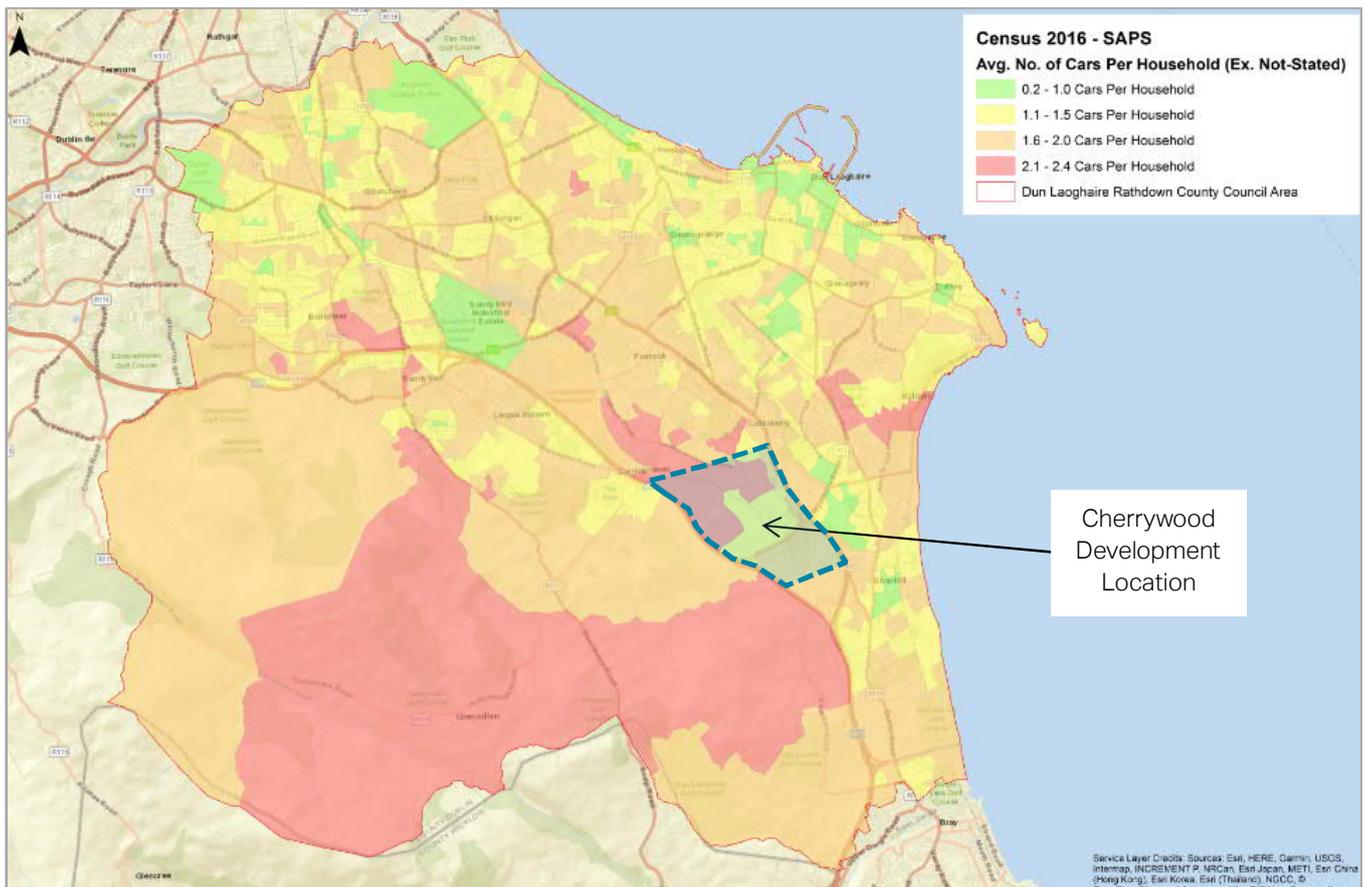


Figure 4.2: Average Number of Cars per Household, Dun Laoghaire-Rathdown

To further evaluate how the calculated rate of proposed parking space provision may compare with actual rates of car ownership within the proposed Cherrywood SDZ, several car ownership surveys have been conducted within Dublin. The average in the DLRC area is 1.4 cars per household as below.

Table 4-2: Car Ownership Survey Results – Entire DLRC Area

Entire DLRC Area (Excluding Not-Styled)						
Code	Description	Result	% Households	Total Cars	Ave/household	
Sum of T15_1_NC	No motor car	9,915	12.9%	0		
Sum of T15_1_1C	1 motor car	33,633	43.8%	33,633		
Sum of T15_1_2C	2 motor cars	27,210	35.5%	54,420		
Sum of T15_1_3C	3 motor cars	4,638	6.0%	13,914		
Sum of T15_1_GE4C	4+motor cars	1,342	1.7%	5,368		
		76,738		107,335	1.399	

Locating areas similar to Cherrywood in Dublin is difficult due to the unique conditions at Cherrywood due to the mixed use development, distance from city centre and PT services however a number of locations have been chosen to give an understanding of car ownership in different areas. Areas with a 1km radius have been chosen as shown on Figure 4.3 to 4.9 below.



Figure 4.3: Dun Laoghaire Car Ownership Survey



Figure 4.4: Sandymount Car Ownership Survey

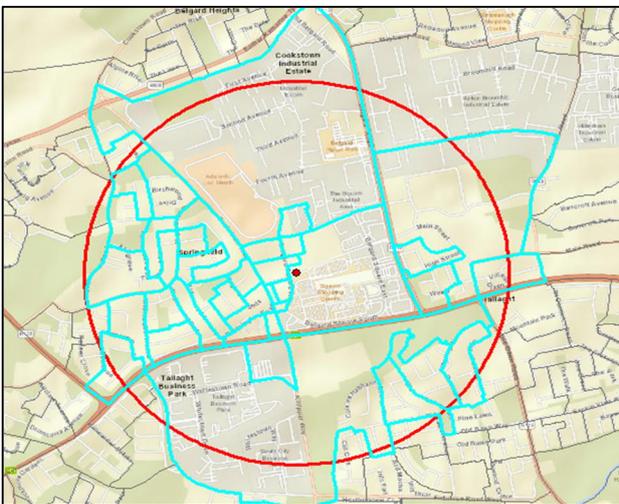


Figure 4.5: Tallaght Car Ownership Survey

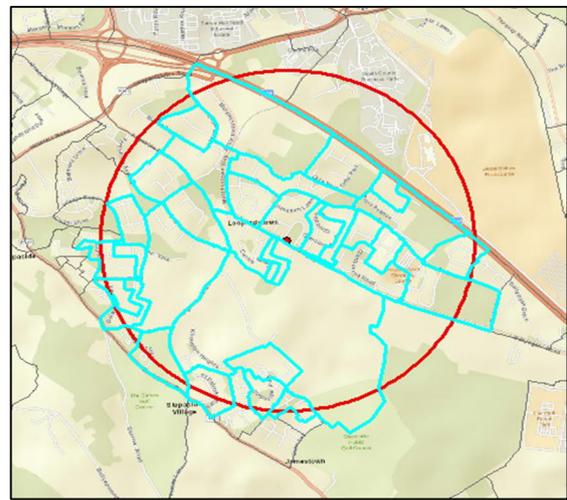


Figure 4.6: The Gallops Leopardstown Car Ownership Survey

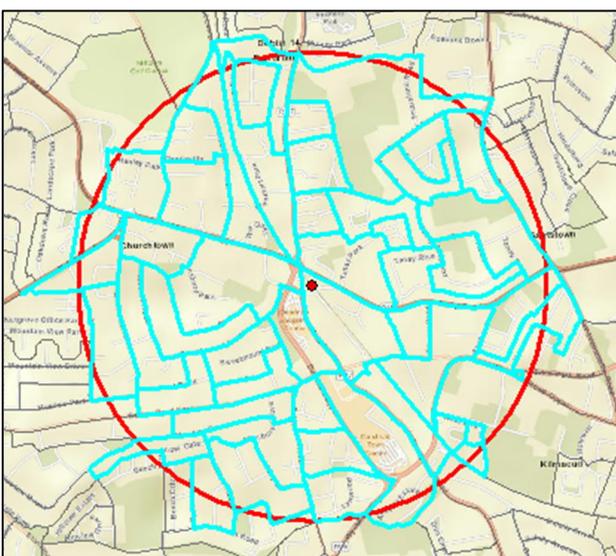


Figure 4.7: Dundrum Car Ownership Survey

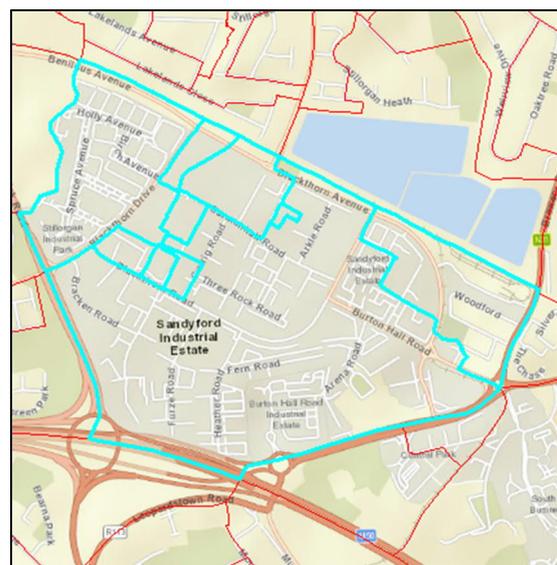


Figure 4.8: Sandyford Car Ownership Survey

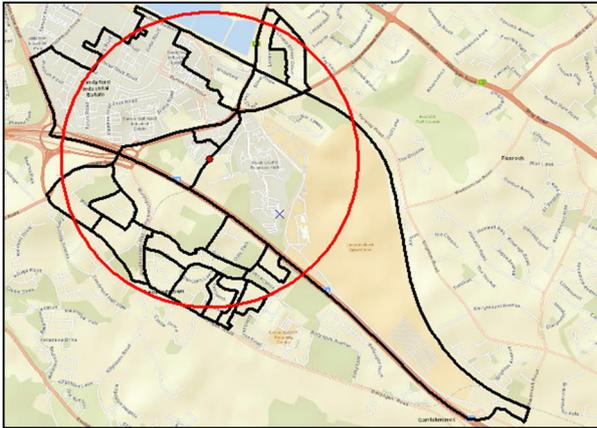


Figure 4.9: Central Park Car Ownership Survey

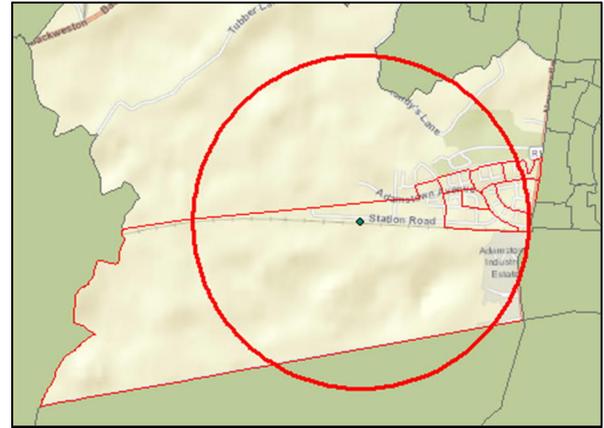


Figure 4.10: Adamstown Car Ownership Survey

As can be seen from the results shown in Table 4-3 to Table 4.10 below, car ownership differs significantly from location to location.

Table 4-3: Car Ownership Survey Results - Dun Laoghaire

Dun Laoghaire (Excluding Not-Stated)					
Code	Description	Result	% Households	Total Cars	Ave/household
Sum of T15_1_NC	No motor car	902	31.7%	0	
Sum of T15_1_1C	1 motor car	1,373	48.3%	1373	
Sum of T15_1_2C	2 motor cars	483	17.0%	966	
Sum of T15_1_3C	3 motor cars	70	2.5%	210	
Sum of T15_1_GE4C	4+motor cars	17	0.6%	68	
		2,845		2,617	0.920

Table 4-4: Car Ownership Survey Results - Sandymount

Sandymount (Excluding Not-Stated)					
Code	Description	Result	% Households	Total Cars	Ave/household
Sum of T15_1_NC	No motor car	761	18.8%	0	
Sum of T15_1_1C	1 motor car	1,936	47.8%	1936	
Sum of T15_1_2C	2 motor cars	1,083	26.7%	2166	
Sum of T15_1_3C	3 motor cars	210	5.2%	630	
Sum of T15_1_GE4C	4+motor cars	62	1.5%	248	
		4,052		4,980	1.229

Table 4-5: Car Ownership Survey Results - Tallaght

Tallaght (Excluding Not-Stated)					
Code	Description	Result	% Households	Total Cars	Ave/household
Sum of T15_1_NC	No motor car	1,099	25.9%	0	
Sum of T15_1_1C	1 motor car	2,238	52.8%	2238	
Sum of T15_1_2C	2 motor cars	751	17.7%	1502	
Sum of T15_1_3C	3 motor cars	126	3.0%	378	
Sum of T15_1_GE4C	4+motor cars	28	0.7%	112	
		4,242		4,230	0.997

Table 4-6: Car Ownership Survey Results - The Gallops Leopardstown

The Gallops (Excluded Not-Stated)						
Code	Description	Result	% Households	Total Cars	Ave/household	
Sum of T15_1_NC	No motor car	193	5.5%	0		
Sum of T15_1_1C	1 motor car	1,501	43.0%	1501		
Sum of T15_1_2C	2 motor cars	1,570	45.0%	3140		
Sum of T15_1_3C	3 motor cars	168	4.8%	504		
Sum of T15_1_GE4C	4+motor cars	55	1.6%	220		
		3,487		5,365	1.539	

Table 4-7: Car Ownership Survey Results - Dundrum

Dundrum (Excluding Not-Stated)						
Code	Description	Result	% Households	Total Cars	Ave/household	
Sum of T15_1_NC	No motor car	595	13.1%	0		
Sum of T15_1_1C	1 motor car	2,063	45.5%	2063		
Sum of T15_1_2C	2 motor cars	1,541	34.0%	3082		
Sum of T15_1_3C	3 motor cars	259	5.7%	777		
Sum of T15_1_GE4C	4+motor cars	76	1.7%	304		
		4,534		6,226	1.373	

Table 4-8: Car Ownership Survey Results - Sandyford

Sandyford (Excluding Not-Stated)						
Code	Description	Result	% Households	Total Cars	Ave/household	
Sum of T15_1_NC	No motor car	497	34.7%	0		
Sum of T15_1_1C	1 motor car	705	49.2%	705		
Sum of T15_1_2C	2 motor cars	200	13.9%	400		
Sum of T15_1_3C	3 motor cars	24	1.7%	72		
Sum of T15_1_GE4C	4+motor cars	8	0.6%	32		
		1,434		1,209	0.843	

Table 4-9: Car Ownership Survey Results – Central Park, Sandyford

Central Park (Excluding Not-Stated)						
Code	Description	Result	% Households	Total Cars	Ave/household	
Sum of T15_1_NC	No motor car	261	11.7%	0		
Sum of T15_1_1C	1 motor car	925	41.4%	925		
Sum of T15_1_2C	2 motor cars	873	39.1%	1746		
Sum of T15_1_3C	3 motor cars	133	6.0%	399		
Sum of T15_1_GE4C	4+motor cars	43	1.9%	172		
		2,235		3,242	1.451	

Table 4-10: Car Ownership Survey Results – Adamstown

Central Park (Excluding Not-Stated)					
Code	Description	Result	% Households	Total Cars	Ave/household
Sum of T15_1_NC	No motor car	63	2.8%	0	
Sum of T15_1_1C	1 motor car	492	22.0%	492	
Sum of T15_1_2C	2 motor cars	358	16.0%	716	
Sum of T15_1_3C	3 motor cars	32	1.4%	96	
Sum of T15_1_GE4C	4+motor cars	5	0.2%	20	
		2,235		1,324	1.394

The lowest levels of car ownership per household were recorded in the Sandyford (0.843 cars per household), Dun Laoghaire (0.920 cars per household) and Tallaght (0.997 cars per household) surveys, compared to Sandymount (1.229 cars per household), Dundrum (1.373 cars per household), Adamstown (1.39 cars per household), Central Park (1.451 cars per household) and The Gallops (1.539 cars per household).

There are a number of variables which influence these differences such as socio-economic conditions, development mix, dwelling size and the quality and extent of public transport services. Given the distance Cherrywood is from the city centre, the type of development and the likely demographics of residents it is likely that car ownership levels will be in the region of 1.3 – 1.4 cars per household especially in the short to medium term.

5. Car Parking Requirements

Apartment to Parking Ratio

To determine whether the proposed car parking arrangements meet the objectives outlined in the literature outlined in Section 2 above, an assessment was conducted to quantify the number of proposed apartments within each Residential Area and in turn, calculate the number of parking spaces to adequately meet requirements. Quantification of the number of parking spaces was based on the existing Cherrywood parking standards set out below. It should be noted that the parking guidelines for Cherrywood are reduced in comparison to the DL RCC Development Plan.

Table 5-1 Parking Standards as set out in Cherrywood planning scheme

Town Centre	1 space per unit
Neighbourhood Centres	1 space per unit
Res 3 and 4	1 space per 1 bed unit, 1.25 spaces per 2 bed unit, 1.5 spaces per 3 or more bed unit
Res 1 and 2	1 space per 1 bed unit, 1.5 spaces per 2 bed unit, 2 spaces per 3 or more bed unit

Source: DL RCC Cherrywood Scheme.

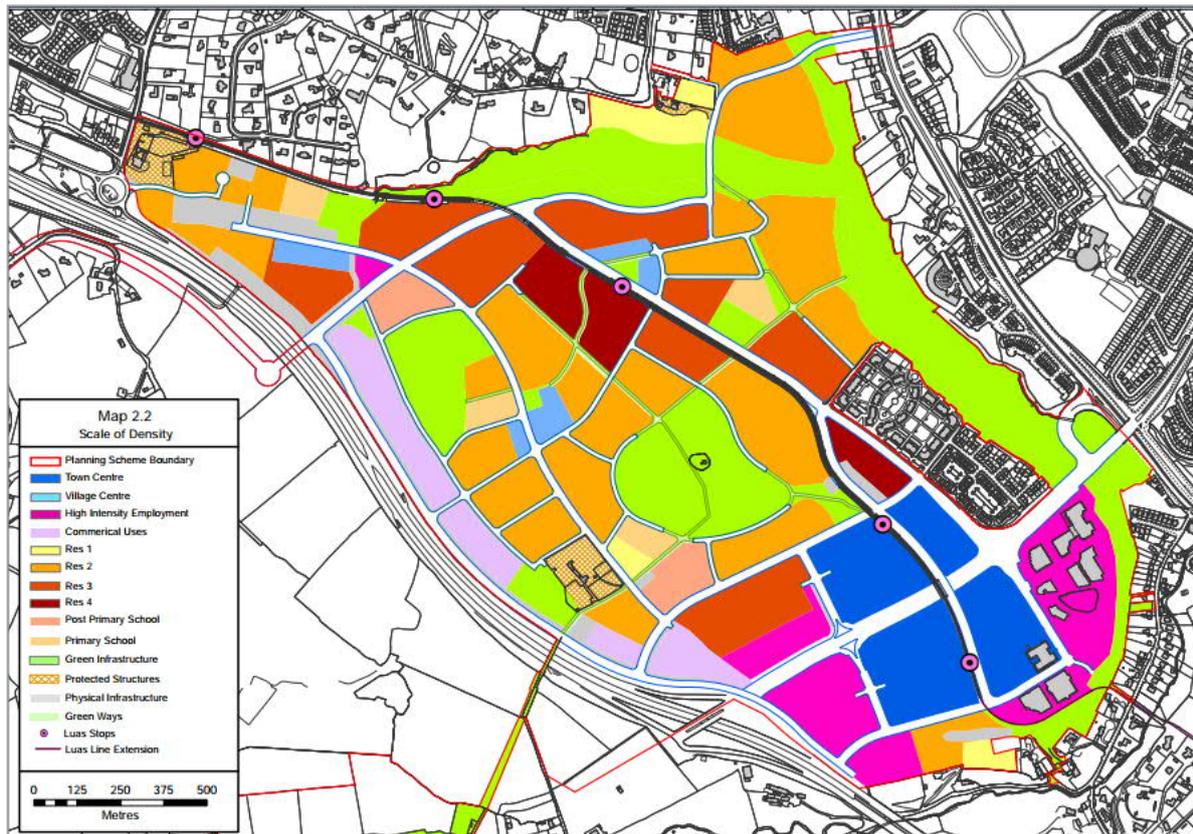


Figure 5.1 Cherrywood SDZ Map of Residential Areas

As shown on Figure 5.1 above, there are four areas of residential development within Cherrywood all of which have different residential mixes. Chapter 2 of the Cherrywood SDZ report states: "Density ranges are based on factors such as location, topography, proximity to services and individual site sensitivities.... The density ranges used in Cherrywood are to ensure a range and typology of homes for all sectors of the future resident population". The breakdown of units by no. of bedrooms for each residential development area, together with details on the car parking requirement calculations within each residential area, is presented in Appendix A. Residential Area 1 has been discounted from the car parking requirement calculations for the purposes of this report as Residential Area 1 will solely be comprised of housing units and not apartments.

The resulting car parking requirements for apartments within each of the residential areas are set out in Table 5-2. These results are based on the assumptions and calculations outlined above.

Table 5-2: Overall Car Parking Requirements for the proposed Cherrywood Development

	Minimum Residential Yield	Car Parking Requirement	Maximum residential Yield	Car Parking Requirement
Res 1	137	274	195	390
Res 2	1976	3360	3073	5224
Res 3	1385	2043	2130	2663
Res 4	502	628	738	923
Town and Village Centres	1596	1596	2050	2050
TOTALS	5,596 Units	7,900 Spaces	8,186 Units	11,250 Spaces
Min/Max Ratio - Spaces per Household		1 to 1.41		1 to 1.37
Min/Max Ratio - Spaces per Household (Apartments only)		1 to 1.40		1 to 1.36

This is in line with figures taken from the 2016 Census, as shown in Table 4-2 above, which indicated that the average number of cars per household in the Dun Laoghaire–Rathdown is **1.4 cars per household** and in line with upper end of expectations of a **car ownership rate of circa 1.3 – 1.4** as set out in Section 4. It is also significantly lower than the car ownership rates in The Gallops in Leopardstown and Central Park which are somewhat comparable to Cherrywood in terms of demographics of residents, access to Luas and distance from the city centre.

6. Discussion on Car Parking Requirements

As highlighted in Section 2 above, provision should be made to reduce car parking spaces as much as possible in areas where public transport systems are highly accessible however it is important to understand the differentiation between car usage and car ownership. Whilst it can be expected that car ownership in Cherrywood will be lower than the DLR county as a whole due to the sustainable mode focussed services and design there is a limit to the reduction that can be applied before issues arise due to the under provision of car storage facilities. Figure 6.1 below details the proposed public transport network for the development.

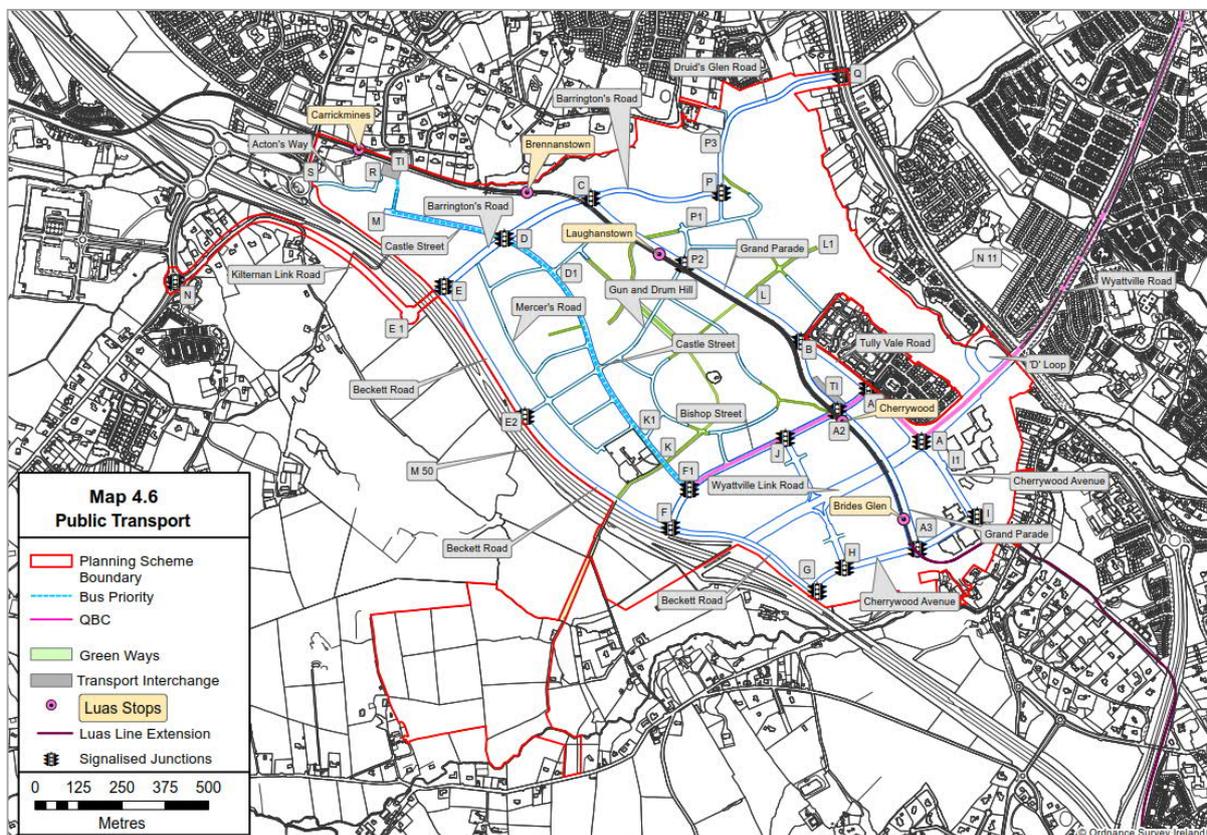


Figure 6.1: Map 4.6 Proposed Public Transport Network, Cherrywood SDZ report

Provision of a Quality Bus Corridor along the Wyattville Link Road, Bus Routes along Bishop Street and Tullyvally Road, a Bus Priority route along Castle Street and a Luas line with several projected stops along Grand Parade should ensure that the majority of residents living within the development will have reasonable levels of access to public transport however it should be noted that the existing Luas and proposed bus routes will only serve a limited catchment.

Given the proximity of the residential areas to PT there could be scope for a reduced level of car parking spaces in these areas to account for the likely lessened requirement for car usage. The amended Cherrywood Planning Scheme already allows for reduced parking at these locations for 2-bed and 3-bed apartments in Res Ares 3 and 4.

Table 6-1: Revised Car Parking Standards - Apartments

Development Type	Parking Rate
Town Centre	1 space per unit
Neighbourhood Centres	1 space per unit
Res 1, 2, 3 and 4*	1 space per 1 bed unit
	1.25 space per 2 bed unit 1.5 space per 3 bed unit

If this reduction was applied to apartment in all residential areas i.e. all 2 beds require a max of 1.25 parking spaces and 3-beds require a max of 1.5 parking spaces, the car parking requirements would be as set out below.

Table 6-2: Adjusted Car Parking Requirements

	Minimum Residential Yield	Car Parking Requirement	Maximum residential Yield	Car Parking Requirement
Res 1	137	274	195	390
Res 2	1,976	2,915	3,073	4,533
Res 3	1,385	2,043	2,130	2,663
Res 4	502	628	738	922
Town and Village Centres	1,596	1,596	2,050	2,050
TOTALS	5,596 Units	7,455 Spaces	8,186 Units	10,557 Spaces
Min/Max Ratio Spaces per Household	1 to 1.33		1 to 1.29	
Min/Max Ratio Spaces per Household (Apartments only)	1 to 1.32		1 to 1.27	

These adjusted figures would be in line with the *Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities* document and allow for a reduction in car ownership rates compared to the wider DLRCC area. It would be reasonable to assume that this would not cause any issues in relation to under provision of parking given the likely demographics of residents and the proximity to public transport. It is however recommended that monitoring is undertaken as residential development progresses to gain an understanding of the car ownership requirements of residents which is influenced by commuting patterns, demographics, scale of PT services put in place by the NTA and TII etc.

Other Considerations

- **Alternative mobility solutions** - In addition to the above it is recommended that consideration is given to giving over publically available spaces to alternative mobility solutions such as car sharing facilities/operators to encourage more environmentally friendly car usage and reduce the need for car ownership. The provision of car sharing facilities/operators could lead to a significant reduction in the need for car spaces whilst providing residents with the same mobility freedom. A 2010 study of 3,000 city dwellers in the UK found that the average car was parked for 97% of its life. The range and service of transport systems play a factor in the decision to do without a car. If car sharing, bus and walking are readily available, people will be more willing to not own a car. Research has suggested that one shared car can remove 9-13

private cars from the road¹ whilst research undertaken by one of the leading car sharing services in Ireland suggests that a shared car can replace in the region of 15-20 private cars².

AECOM are aware that there are now numerous cities in the United States such as Los Angeles, San Francisco, Sacramento, Portland Oregon, Seattle, Minneapolis, Detroit, Pittsburgh, Buffalo, Washington, Miami and New York that have removed parking standards in several districts to encourage multi modal transportation growth and alternative vehicle options such as car sharing to encourage strong residential/business development growth & realise reduced developer costs for parking accommodation.

The key risk around delivering car sharing services in place of assigned parking spaces is the lack of long term security. The removal of the shared car by a provider, and the lack of enforcement options within the remit of the local authority, could lead to an under provision of spaces in the future.

The need for 24 hour and seven days a week availability of car sharing services requires that a significant proportion of dedicated car sharing spaces be provided on street which are publicly accessible. Serving as advertising and providing time saving and convenience of location to users. The dedicated spaces are generally located within close proximity to the homes and work places of car sharing users.

The reduction in the number of parking spaces in response to the number of car shared spaces incorporated in any new development is presented below for three scenarios 1 shared car space equals 10, 15 and 20 standard car parking spaces. To mitigate against the risk of under provision in the short term, a conservative approach has been used for the remainder of this note, assuming that each new car shared space will reduce the number of private parking spaces by 10³. Thus, as shown in Figure 6.2, in a scenario where 20 car shared spaces are included, the reduction in parking spaces that are needed will be of 200.

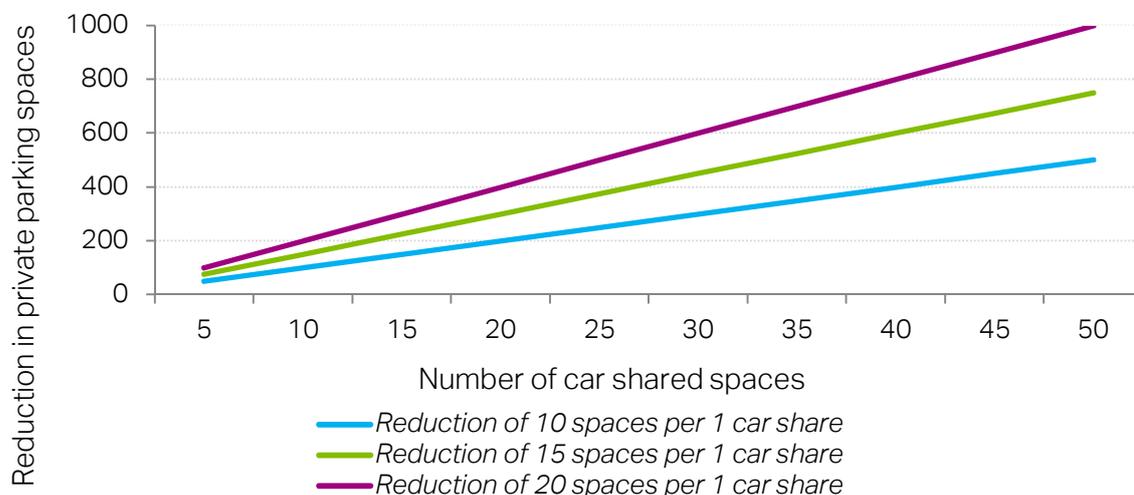


Figure 6.2: Reduction of parking spaces when incorporating car shared spaces⁴

For this scenario, where there were 50 car sharing spaces dispersed through the SDZ the standards would be as below. In Table 6-3, the adjusted car parking requirements have been recalculated by including the car shared spaces, and in Table 6-4, the revised car parking

¹ Impact of Car sharing on Household Vehicle Holdings, Martin & Shaheen & Lidicker, University of California, 2010

² Source: GoCar

³ It is noted that the actual service in Ireland is limited since it requires that the shared car is returned to the same point where the car was taken. In other European cities, such as London, Madrid, and Amsterdam, the car shared service allows to park the car in a different point given more flexibility to the users

⁴ Using the reference of 1 car shared space reduces between 10 – 20 parking spaces

standards are presented for this case. Reduced parking standards are included for all apartments, town centre and houses.

Table 6-3: Adjusted Car Parking Requirements- with 50car shared spaces included

	Minimum Residential Yield	Car Parking Requirement	Maximum residential Yield	Car Parking Requirement
Res 1	137	260	195	371
Res 2	1,976	2,759	3,073	4,290
Res 3	1,385	1,934	2,130	2,520
Res 4	502	594	738	872
Town and Village Centres	1,596	1,436	2,050	1,845
TOTALS	5,596 Units	6,983 Spaces	8,186 Units	9,899 Spaces
Number of car shared spaces incorporated	-	50	-	50
TOTAL (including reduction)		7,033		9,949
Min/Max Ratio Spaces per Household	1 to 1.25		1 to 1.21	
Min/Max Ratio Spaces per Household (Apartments only)	1 to 1.30		1 to 1.25	

**Above assumes that 1 car sharing space is equivalent to 10 standard car spaces*

Table 6-4: Revised Car Parking Standards- with 50 car share spaces included

Development Type	Parking Rate
Town Centre	0.9 space per unit
Neighbourhood Centres	0.9 space per unit
Res 1, 2, 3 and 4	Private Car Spaces
	0.9 space per 1 bed unit
	1.2 spaces per 2 bed unit
	1.4 spaces per 3 or more bed unit
Shared Car Spaces	1.9 spaces per house with 3+ beds
	Minimum of 0.01 space per unit

Recommendation: At this stage, it is difficult to predict the impact of car sharing, however, its use in on the increase and should be accounted for. Should DLRCC consider it appropriate and seek to encourage its use the parking standards could be reduced as set out above.

- **Car Sharing Saturation** - While it is recommended that car sharing spaces should be well distributed throughout Cherrywood, consideration should also be given to the total number of car sharing cars which any particular development area is likely to be able to support to a commercially viable extent (this point would not necessarily apply in circumstances where the car sharing service was not expected to be self-sustaining – i.e. if a developer agreed to subsidise a service). Currently, GoCar are working hard to grow the market for car sharing in Ireland and they expect to expand the fleet to 1,000 cars in the Dublin area by the end of 2019. Given the scale of the population served by these 1,000 cars in comparison to planned population in Cherrywood it is suggested that, in the short term anyway, the potential for car sharing is limited to 10 – 50 shared cars.

However, research identifying success factors for car sharing schemes in new residential developments has shown that the success of car sharing schemes is influenced by a range of factors including: population density; ease of access to local services and availability of public transport (as this contributes to reducing car ownership within an area); parking constraints and other cultural and socioeconomic/demographic characteristics⁵. Therefore, in addition to the fact that the market for car sharing in general is expected to continue expanding over time, it also seems likely that a much stronger market/demand for car sharing schemes in terms of cars/person could be created within Cherrywood as compared to the existing ratio of shared cars to people in the Dublin area for the following reasons:

- The proximity of good public transport, and walking and cycling accessibility is recognised to contribute to the success of car sharing schemes. If residents can easily undertake regular one-way trips which would be uneconomic to undertake using a car share vehicle (e.g. commuting) by other sustainable modes and use a car sharing scheme car for more occasional and incidental trips, this reduces the incentive to acquire a personal vehicle. The fact that Cherrywood is designed so that daily commutes to work and school should not generally require the use of a private car therefore increases the potential pool of car sharing members.
- Cherrywood will benefit from a more permeable layout and a more attractive walking environment than currently exists in many other areas where existing car sharing services are located and therefore the ease of access to the car sharing fleet will be easier for many potential customers in comparison to potential customers in other areas.

Based on the above factors, it seems reasonable that the viable ratio of car sharing vehicles to population in Cherrywood will be higher than the figure calculated above for the wider Dublin County area. If Cherrywood could support one third more car sharing vehicles per head of population than predicted Dublin figure by end of 2019, the maximum potential provision in terms of cars distributed throughout the area (for an assumed population of 30,000) would be 30 car sharing cars. If Cherrywood could support double the number of car sharing vehicles per head of population than the previously calculated estimate for the full Dublin area, this would result in a maximum of 45 spaces (for an assumed population of 30,000).

Recommendation: In the short term it is considered that Cherrywood could cater for 30-45 shared cars across the full area. It is not possible estimate a long term 'saturation' point with regard to car sharing provision and demand as this will be impacted by so many internal and external factors. The uptake of car sharing in general is likely to grow over time as more people become familiar with the concept. Monitoring of uptake and provision within the earliest developments completed should help to inform assessments of future potential.

- **Car parking space repurposing** - As set out in Chapter 4 recent historical trends suggest an upward curve in car ownership however in the future there is potential for this to reduce significantly due to technology and the digitalisation of the shared mobility network. In addition to allowing for car sharing proposals consideration should be given to design which allows for longer term repurposing of car parking. This could be especially valuable in the case of visitor parking which could be provided external to residential developments and designed in such a way to allow for repurposing as peoples travel behaviours continue to change into the future.

⁵ <https://como.org.uk/wp-content/uploads/2018/06/Car-Clubs-in-New-Developments-Report-1.pdf>

There is already technology commercially available to reduce the footprint and building costs for off street multi story car parking facilities that may save Local Authorities up to 60% of traditional costs and allow construction of parking facilities in places that would have been previously unusable for this purpose.

Recommendation: Opportunities for the development of surface car parking to accommodate the short term parking needs of residents/employees should be investigated to allow for future repurposing of parking for other uses as mode choice/working preferences change.

- **Parking for Studio Apartments** - Research was undertaken in relation to the emergence of Studio. It should be noted that the existing Irish examples are unlikely to be relevant as the current Development Plans were published prior to the introduction of the revised Planning Guidelines for Apartments in March 2018. In the 2015 Apartment guidelines Studio type apartments were only allowable in very limited, specific circumstances and therefore may not have been considered very relevant to consider when parking standards were being developed.

Considering total potential occupancy and other factors which influence car ownership generally, there are a number of reasons to believe average demand for car parking per studio is likely to be lower than the equivalent demand per 1 bedroom apartment.

One of the most significant differences between the two is that the Apartment Guidelines specify that a Studio is for one person while a 1-bedroom apartment can accommodate two people. This means a significant proportion of 1 bed apartments will be occupied by two adults who could potentially both be drivers, while the majority of studios in contrast will only contain one adult.

A 2013 discussion paper⁶ published by the School of Economics at the University of Surrey identified a number of factors which influence the possession of cars in Irish households using data from the Irish Household Budget Survey (which is carried out by the CSO every five years). The most recent Household Budget Survey available to the research at the time was the 2009/10 data. The researcher used two different types of econometric models to identify factors influencing car ownership at the household level, a multinomial logit (MNL) and ordered logit (OL) model. A number of the variables assessed were based on the status of the 'head of household' (HOH) or household reference person.

Some of the factors identified as influencing car ownership are relevant to understanding potential differences in car ownership between occupants of Studios and 1-bed apartments as follows:

- **Age of the HOH:** In the OL model, older HOH's were less likely to possess 'zero' or '1' cars and are more likely to possess '2' or '3+' cars. In the (preferred) MNL model, the impact of age was less significant but over 65's were still less likely to possess zero cars.
- **Marital status:** Marital Status was found to be a very strong predictor of car ownership. This is likely to be partly an indirect income effect of an extra income in the household.
- **Total Weekly Household Expenditure per Adult:** This was used in the study as an alternative to using income due to data availability and the fact that incomes tend to fluctuate more over a long period compared to expenditure (e.g. amongst self-employed people). A one percent proportional increase in the total level of weekly household expenditure (per adult) decreases the probability of owning zero cars by approximately 14-18 percent.

Given that studios are a less attractive accommodation option they are likely to be occupied by individuals who cannot afford to rent a standard 1-bed apartment. Therefore their occupants will tend to be younger, single and have lower incomes in comparison to typical occupants of 1-bed apartments in the same development. Therefore, the demand for car ownership will generally be lower amongst studio occupants as car ownership is negatively associated with each of these characteristics.

Recommendation: Based on lower average number of adults per studio in comparison to a 1-bed apartment as well as likely socio-economic characteristics, parking demand associated with studios will generally be lower than that associated with 1-bed apartments. There is a relative lack of good data or sources to use in setting a relative rate given that studios in apartment blocks are a relatively new concept in Ireland. The approach used in Edinburgh for small to medium size developments was to apply a lower 'minimum' standard to studios (between 50% and 66% lower) in comparison to 1-bed apartments in zones where minimum standards apply. Therefore one potential approach to studios in Cherrywood could be to apply a lower standard to studios of 50-70% of the rate applied to 1-bed apartments.

7. Reducing the Visual Impact of Parking

A number of methods may be employed in regards to reducing the visual impact of the proposed car parks, examples of which are shown on Figure 7.1 to Figure 7.6 below. These landscaping features can provide a practical function such as Grasscrete car parks as shown on Figure 7.1 and Figure 7.3 below or alternatively a decorative function examples of which may be found in the Spencer's Dock and other residential facilities, as shown on Figure 7.4 and Figure 7.6 below.



Figure 7.1: Example of Grasscrete car park, St. Agatha's church



Figure 7.2: Example of Grasscrete hotel car park



Figure 7.3: Example of Grasscrete Road



Figure 7.4: Car Park Rooftop landscaping features at Spencer's Dock in Dublin



Figure 7.5: Car Park Rooftop landscaping features



Figure 7.6: Landscaping on the roof of underground car park at Spencer's Dock in Dublin

8. Risks in Parking Provision

A balance needs to be found between providing car parking in line with car ownership expectations for residents whilst also ensuring parking is not overprovided so as to encourage and increase car usage in place of public transport and other sustainable modes. The potential risks around under or over providing parking are outlined below.

Underproviding

The under provision of parking spaces can lead to a number of issues such as;

- Community – Zero or low parking availability will attract a certain demographic that are more mobile and open to using various modes of transport but it may be a deterrent to families, elderly and others dependent on cars for travel.
- Illegal Parking
 - Aesthetical – under provision can lead to illegal parking and a situation where vehicles are parked in unsuitable locations.
 - Worsened traffic conditions – vehicles parked on the street are physically narrowing available space for driving and manoeuvring, worsening visibility, limited accessibility for maintenance vehicles.
 - Less space for pedestrians – illegally parked vehicles often find place on pavements which results with not enough of space for pedestrians,
 - Safety – pedestrians are especially in danger where vehicles are parked illegally as they restrict sightlines.
 - Congestion & pollution – Motorists will create additional environmental pollution via vehicle emissions through the act of driving around looking for parking, this will also create vehicle congestion as motorists slow down while attempting to spot parking locations or waiting till a vehicle moves to take the space.
 - Impedance of emergency services – At locations where parked cars are restricting the width of the carriageway i.e. parked on both sides of the road, large vehicles such as buses or trucks may not be able to pass along the carriageway. This could slow or block services such as fire tenders and other emergency vehicles from reaching their destinations.



Figure 8.8.1 Angle parked vehicles instead of parallel as designated



Figure 8.8.2 Vehicles parked along both sides of two-way street

Overproviding parking space

The over provision of parking spaces can lead to a number of issues such as;

- Increased cost of dwellings due to the cost of constructing the parking, particularly underground parking.
- Increased risk of the PT mode share forecasts not being realised due to higher likelihood of residents being induced to owning, and therefore using, their cars.
- Increased traffic congestion due to the increase in private car usage which would be using space that could be used for other purposes.

9. Prevention of Illegal Parking

In some areas of the Cherrywood development it may be necessary to include features which would prohibit the practise of illegal and informal parking. Preventative features could include but would not be limited to the following:

- Raised Kerbs
- Hedges or dense shrubbery
- Walls, high , low or retaining
- Fencing or railings
- Barriers
- Bollards
- Grass vergers of suitable gradient e.g. bunds, mounds etc.
- Flower beds or rockery
- Trees
- Enforceable Restrictions

It may also be judicious to consider the use of small urban parks or parklets as a means of reducing illegal parking. Parklets usually extend over the kerbside and contain landscaping, seating, tables and cycle parking. Along with deterring illegal parking practises, parklets provide open places to sit for everyone which would also help to contribute to a sense of place.

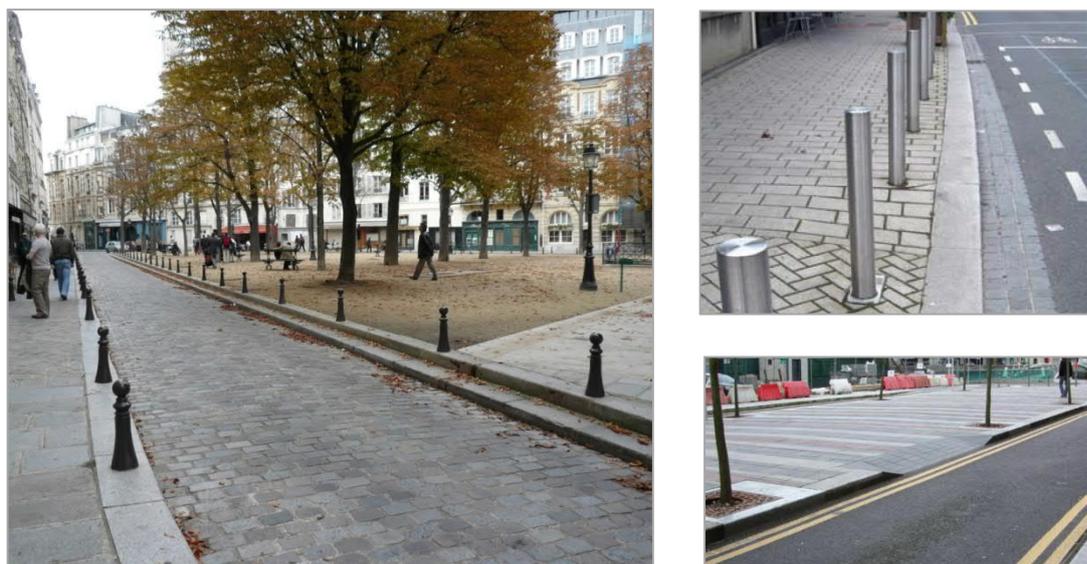


Figure 9.1 - Prevention of Illegal Parking

10. Recommendations

AECOM were commissioned by Dun Laoghaire-Rathdown County Council (DLRCC) to undertake a review of the proposed parking facilities within the Cherrywood Strategic Development Zone (SDZ), with a view to providing technical advice on whether any intervention is required to bring the development in line with recently published guidelines i.e. Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities published by the Department of Housing, Planning and Local Government, March 2018. Key findings and recommendations are set out below;

- Case studies of parking standards set out by other local authorities throughout Ireland and the UK found that the parking standards set out by DLRCC for Cherrywood SDZ are at the lower end of the spectrum for similar locations i.e. suburban with reasonable PT accessibility.
- It is important to understand the difference between car usage and car ownership to for any parking guidelines to take cognisance of car ownership trends. An assessment of car ownership throughout Ireland based on the 2016 Census shows that the DLRCC area has one of the highest car ownership rates in the country with 621 cars per 1,000 adults. In Dublin the average rate of car ownership amongst all the local authorities is 496 cars per 1,000 adults.
- An assessment of car ownership rates for other large scale mix use development areas with similar demographics and PT accessibility found that the lowest levels of car ownership per household were recorded in Sandymount (0.843 cars per household), Dun Laoghaire (0.920 cars per household) and Tallaght (0.997 cars per household) surveys whilst highest rates of car ownership were found in Sandymount (1.229 cars per household), Dundrum (1.373 cars per household), Adamstown (1.39 cars per household), Central Park (1.451 cars per household) and The Gallops (1.539 cars per household).
- The **existing parking standards** for Cherrywood SDZ would result in car ownership levels of **1.36 – 1.40 cars** per household which is below the current average for DLRCC which, given the distance between Cherrywood and the city centre, is reasonable. However travel behaviours are changing with the emergence of technology, digital working and improved public transport options so it is recommended that car parking for all residential areas is

standardised as below which would result in car ownership levels of **1.27 – 1.32** cars per household.

Table 10-1: Recommended Car Parking Standards

Area	Car Parking Standard
Town Centre	1 space per unit
Neighbourhood Centre	1 space per unit
Res 1,2, 3 and 4	1 space per 1-bed unit 1.25 spaces per 2-bed unit 1.5 spaces per 3+-bed unit

*Visitor parking is in addition to above

- These adjusted figures would be in line with the *Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities* document and allow for a reduction in car ownership rates compared to the wider DL RCC area. It would be reasonable to assume that this would not cause any issues in relation to under provision of parking given the likely demographics of residents and the proximity to public transport. It is however recommended that monitoring is undertaken as residential development progresses to gain an understanding of the car ownership requirements of residents which is influenced by commuting patterns, demographics, scale of PT services put in place by the NTA and TII etc.
- In relation to Studio apartments one potential approach to studios could be to apply a lower standard to studios of 50-70% of the rate applied to 1-bed apartments.
- In addition to the above, it is recommended that consideration is given to giving over spaces to alternative mobility solutions such as car sharing facilities/operators to encourage more environmentally friendly car usage and reduce the need for car ownership. The provision of car sharing facilities/operators could lead to a significant reduction in the need for car spaces whilst provided residents with the same mobility freedom. Research has suggested that one shared car can remove 9-13 private cars from the road⁷ whilst research undertaken by one of the leading car sharing services in Ireland suggests that a shared car can replace up to 15 - 20 private cars⁸. Thus, with the incorporation of 50 shared car spaces, and assuming that each of the new shared car spaces will reduce in 10 spaces the parking requirements⁹, the number of total private parking spaces can be reduced by 500 (450 space reduction overall). In this scenario, it is recommended that car parking for all residential areas is standardised as below, **resulting in car ownership levels for apartments of 1.25-1.30.**

Table 10-2: Revised Car Parking Standards- with 50 car share spaces included

Development Type	Parking Rate
Town Centre	0.9 space per unit
Neighbourhood Centres	0.9 space per unit
Res 1, 2, 3 and 4	Private Car Spaces
	0.9 space per 1 bed unit
	1.2 spaces per 2 bed unit
	1.4 spaces per 3 or more bed unit
Shared Car Spaces	1.9 spaces per house with 3+ beds
	Minimum of 0.01 space per unit

⁷ *Impact of Car sharing on Household Vehicle Holdings, Martin & Shaheen & Lidicker, University of California, 2010*

⁸ Source: GoCar

⁹ Research shows that each car share spaces can reduce between 9 – 13 spaces and companies in the area raise this number up to 15. A conservative approach has been used here due to the novelty of the service.

- The key risk around delivering car sharing services in place of assigned parking spaces is the lack of long term security. The removal of the shared car by a provider, and the lack of enforcement options within the remit of the local authority, could lead to an under provision of spaces in the future.
- Historical trends suggest an upward curve in car ownership however in the future there is potential for this to reduce significantly due to technology and the digitalisation of the shared mobility network. Consideration should therefore be given to design which allows for longer term repurposing of car parking. This could be especially valuable in the case of visitor parking which could be provided external to residential developments and designed in such a way to allow for repurposing as peoples travel behaviours continue to change into the future.
- The guidelines and planning process should aim to reduce the visual impact of parking where possible.

Overall the assessment found that the whilst the existing parking standards for Cherrywood are already set to encourage the use of non-car modes there is evidence that travel behaviours are changing with the emergence of technology, digital working and improved public transport options so it is recommended that reduced parking standards be set whilst ensuring the development responds to car ownership requirements, as opposed to car usage, both now and in the future. It is also recommended that, given the pace at which travel behaviour is changing, the car parking standards are reassessed regularly.

Appendix A

An overview of the breakdown of units by size and location together with calculation of parking requirements is presented below.

Residential Area 2

The maximum number of residential units for Residential Area 2 is detailed within the Cherrywood Planning Scheme as follows:

- Residential Area 2 – 70 dwellings per hectare

Based on Specific Objective PD4 the following mix has been applied to the calculation:

- 20% are 1 bedroom units
- 40% are 2 bedroom units
- 40% are 3 bedroom units

Residential Area 2 Required Car Parking spaces

- Maximum number of apartment units = 2,305 comprising:
 - 1 bedroom units at 20% = 461 apartments:461 parking spaces
 - 2 bedroom units at 40% of total = 922 apartments:1383 parking spaces
 - 3 bedroom units at 40% of total = 922 apartments:1844 parking spaces

To comply with Development Plan guidelines, apartments would require 3,688 parking spaces. This equates to approximately 1.7 spaces per apartment.

Residential Area 3

The maximum number of residential units for Residential Area 3 is detailed within the Cherrywood Planning Scheme as follows:

Residential Area 3 & 4 – Maximum density consists of duplex apartments. Based on Specific Objective PD4 the following mix has been applied to the calculation:

- Maximum 20% are 1 bedroom units
- 40-60% are 2 bedroom units
- 20-60% are 3 bedroom units where possible up to maximum cap

Residential Area 3 Required Apartment Car Parking Spaces

- Maximum Number of Apartment Units = 2130 comprising:
 - 1 bedroom units at 20% = 426 apartments:426 parking spaces
 - 2 bedroom units at 60% = 1278 apartments:1598 parking spaces
 - 3 bedroom units at 20% = 426 apartments:639 parking spaces

To comply with Development Plan guidelines, in Residential Area 3 apartments will require a minimum of 2,663 parking spaces. This equates to approximately 1.25 spaces per apartment.

Residential Area 4

Residential Area 4 Required Apartment Car Parking Spaces

- Max Number of Apartment Units = 738 comprising
 - 1 bedroom units at 20% = 148 apartments:148 parking spaces
 - 2 bedroom units at 60% = 442 apartments:553 parking spaces
 - 3 bedroom units at 20% = 148 apartments:222 parking spaces

To comply with Development Plan guidelines, Residential Area 4 apartments will require a minimum of 922 parking spaces. This equates to approximately 1.25 spaces per apartment.

Scrutinising the development as a whole, the maximum development scenario equates to an average apartment unit to parking space ratio of approximately 1.4 parking ` spaces to every 1 apartment.

