# Proposed Residential Apartment Development
# at
# Units 64/65 Cherry Orchard Industrial Estate
# Palmerstown
# Dublin 10

## Traffic Impact Assessment
## Mobility Management Plan
## and
## DMURS Statement

**Prepared for**
**AAI Palmerstown Ltd**

**December 2021**

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Traffic and Transportation Planning Consultants

Contents.



Appendices.

## 1.0 Introduction.

1.1 TPS M Moran & Associates have been retained by AAI Palmerstown Ltd to carry out a Traffic Impact Assessment (TIA) relating to a proposed residential apartment development on regeneration lands within the site of 64/65 Cherry Orchard Industrial Estate, Palmerstown, Dublin 10.

1.2 The proposed Build to Sell development now consists of 144 residential apartment units of which 72 are one-bedroom apartments with 72 are two-bedroom apartments with 65 car parking spaces, 226 bicycle parking spaces for residents, 84 bicycle parking spaces for visitors, 8 motorcycle spaces and 2 car club spaces are also proposed. This proposal is a reduction of 3 residential units on the scheme which was previously presented to An Bord Pleanala at the pre application stage within ABP Ref: 310483-21.

1.3 In this report we will identify the existing traffic conditions and assess the relative level of impact the proposed development is likely to have on the local road network. We will also identify how the traffic associated with the proposed residential apartment development can be accommodated on the adjacent road network.

1.4 The methodology used within this TIA complies with best practise for Traffic Impact Assessments indicated within key publications, which include:

- 'Traffic and Transport Assessment Guidelines' National Roads Authority (May 2014).
- 'Guidelines for Traffic Impact Assessments' The Institution of Highways and Transportation.
- The Design Manual for Urban Roads and Streets.

## 2.0 Scope of the Traffic Impact Assessment.

2.1 In this report the existing roads and traffic conditions in the vicinity of the proposed residential apartment development site will be identified. The relative level of impact the proposed development is likely to have on the local road network will be assessed.

2.2 In this report comment will also be made on the proposed vehicular site access arrangements to serve the proposed residential development. In addition, this report, which addresses the likely traffic impact of the proposed development, will generally be structured as follows:

- Assessment of the existing roads, traffic conditions and public transport provision on the road network in the vicinity of the proposed development site.
- Assessment of the trip rates associated with the proposed residential development.
- Assignment of the trip distribution patterns associated with the proposed development onto the adjacent road network.
- Proposed site access arrangements.
- Capacity and operational assessments of the likely impact of the proposed development on the adjacent road network.
- Car Parking Provision.
- Compliance with Design Manual for Urban Roads and Streets 2019.
- Other Traffic Maters.
- Response to traffic matters raised by South Dublin County Council.

2.3 Background information used within this report has been derived from technical information and layout plans prepared by SHIPSEYBARRY Project Architects, Project Architects for this development proposal.

## 3.0 Existing Road and Traffic Conditions and Public Transport Provision.

Existing Road Conditions.

3.1 The proposed development seeks planning permission for a Build to Sell strategic housing development on this 0.85hectare site located at 64/65 Cherry Orchard Industrial Estate. Within the site is an existing light industrial unit of some 3627sq metres which is access from the Cherry Orchard Industrial Estate. The site also bounds the Kennelsfort Road Upper located towards the west of this proposed residential development site. The general location of the proposed 144-unit residential apartment development site is shown outlined in yellow within aerial Map 1.0 below:


Site Location Map 1.0

3.2 In this area Kennelsfort Road Upper operates with an urban speed limit of 30kph and contains with a 7.5 tonne heavy vehicle weight restriction in place along the length of this road. Along the frontage of the site the Kennelsfort Road Upper has a general carriageway width of 8.0metres with broken centre line road markings. Dedicated cycle lanes are also located adjacent to both carriageways with illuminated pedestrian footpaths and wide grass verges located adjacent to both sides of this road. Dublin Bus operates a northbound and southbound service along the Kennelsfort Road Upper with the southbound Bus Stop 4888 located adjacent to the application site and the northbound Bus Stop 2207 located less than 2 minutes walk to the southwest of the development site.

3.3 The horizontal alignment of Kennelsfort Road Upper is generally straight upstream and past the site with a slow road bend towards the southwest of the site. The vertical alignment of this section of Kennelsfort Road Upper can be regarded as being almost flat.

3.4 Along the length of this section of Kennelsfort Road Upper vehicular access is provided to individual residential properties, residential estates, commercial and retail land uses with all of these access points taking the form of simple priority T junctions.

3.5 As such, it can be considered that the principle of direct and indirect vehicular access from the surrounding road network with associated traffic movements is well established within this area.

3.6 To the southwest of the site Kennelsfort Road Upper forms a wide simple priority T junction with an industrial standard estate road connecting the Cherry Orchard Industrial Estate. This estate road generally runs from west to east within the Cherry Orchard Industrial Estate before a road bend takes this estate road southbound to connect with the Ballyfermot Road, again forming a wide priority junction with the Ballyfermot Road.

3.7 The existing Cherry Orchard Industrial Estate Road adjacent to the development application site has a width of some 7.5metres with pedestrian footpaths and grass verges located adjacent to both sites of the industrial estate road. These footpaths are in a poor condition as tree root expansion has overtime extended into these verges and footpaths and ruptured this infrastructure. Street lighting is provided at intervals within this estate road but is damaged providing very limited illumination in parts along this section of the estate road.

3.8 The existing industrial site which forms the application site is accessed at 2 locations from the estate road by means of a wide gated priority arrangement and an uncontrolled priority junction. Both access points contain the pedestrian footpath running through these access points which has dropped kerbing where they connect with the industrial estate road.

3.9 During the operation of the existing industrial site we understand this industrial unit employed some 50 to 60 workers and management staff within the site and operated 5 days a week from Monday to Friday.

3.10 While we do not have any record of daily or peak hour employee trips generated by the existing industrial unit the existing site floor area of 3627sq metres can be reviewed within the TRICS 2021(b) land use database. This database produces daily, and peak trips based on traffic and parking surveys undertaken at similar land use developments.

3.11 From a review of the TRICS 2021(b) database the extent of projected daily and peak hour trips associated with the 3627sq metre floor area is shown within Table 1.0 below.

TOTAL VEHICLES

Survey Start/End: 05:00-21:00
Trip rate parameter range available: 400 - 20700 (units: sqm)

Estimate TRIP rates

State TRP Figure & Extrapolate Results: ON

Estimated TRIP rate value per 3627 SQM
Estimated TRIP rates shown in shaded column (for 3627 SQM)

| TRIP RATE VALUE PER 100 SQM | ARRIVALS Total Rate: 2.255 Peak: 07:00-08:00 | | | Total 81.815 | DEPARTURES Total rate: 2.254 Peak: 16:00-17:00 | | | Total 81.834 | TOTALS Total rate: 4.509 Peak: 07:00-08:00 | | | Total 163.649 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. Days | Ave. GFA | Trip Rate | Estimated Trip rate | No. Days | Ave. GFA | Trip Rate | Estimated Trip rate | No. Days | Ave. GFA | Trip Rate | Estimated Trip rate |
| 00:00-01:00 | | | | | | | | | | | | |
| 01:00-02:00 | | | | | | | | | | | | |
| 02:00-03:00 | | | | | | | | | | | | |
| 03:00-04:00 | | | | | | | | | | | | |
| 04:00-05:00 | | | | | | | | | | | | |
| 05:00-06:00 | 3 | 7410 | 0.013 | 0.489 | 3 | 7410 | 0.000 | 0.000 | 3 | 7410 | 0.013 | 0.489 |
| 06:00-07:00 | 3 | 7410 | 0.009 | 0.326 | 3 | 7410 | 0.004 | 0.163 | 3 | 7410 | 0.013 | 0.489 |
| 07:00-08:00 | 14 | 4630 | 0.646 | 23.444 | 14 | 4630 | 0.117 | 4.252 | 14 | 4630 | 0.763 | 27.696 |
| 08:00-09:00 | 14 | 4630 | 0.244 | 8.841 | 14 | 4630 | 0.122 | 4.420 | 14 | 4630 | 0.366 | 13.261 |
| 09:00-10:00 | 14 | 4630 | 0.123 | 4.476 | 14 | 4630 | 0.100 | 3.637 | 14 | 4630 | 0.223 | 8.113 |
| 10:00-11:00 | 14 | 4630 | 0.105 | 3.805 | 14 | 4630 | 0.105 | 3.805 | 14 | 4630 | 0.210 | 7.610 |
| 11:00-12:00 | 14 | 4630 | 0.134 | 4.868 | 14 | 4630 | 0.106 | 3.861 | 14 | 4630 | 0.240 | 8.729 |
| 12:00-13:00 | 14 | 4630 | 0.143 | 5.204 | 14 | 4630 | 0.188 | 6.826 | 14 | 4630 | 0.331 | 12.030 |
| 13:00-14:00 | 14 | 4630 | 0.187 | 6.770 | 14 | 4630 | 0.199 | 7.218 | 14 | 4630 | 0.386 | 13.988 |
| 14:00-15:00 | 14 | 4630 | 0.150 | 5.427 | 14 | 4630 | 0.127 | 4.588 | 14 | 4630 | 0.277 | 10.015 |
| 15:00-16:00 | 14 | 4630 | 0.275 | 9.960 | 14 | 4630 | 0.236 | 8.561 | 14 | 4630 | 0.511 | 18.521 |
| 16:00-17:00 | 14 | 4630 | 0.119 | 4.308 | 14 | 4630 | 0.555 | 20.143 | 14 | 4630 | 0.674 | 24.451 |
| 17:00-18:00 | 14 | 4630 | 0.051 | 1.846 | 14 | 4630 | 0.281 | 10.183 | 14 | 4630 | 0.332 | 12.029 |
| 18:00-19:00 | 14 | 4630 | 0.039 | 1.399 | 14 | 4630 | 0.097 | 3.525 | 14 | 4630 | 0.136 | 4.924 |
| 19:00-20:00 | 3 | 7410 | 0.004 | 0.163 | 3 | 7410 | 0.013 | 0.489 | 3 | 7410 | 0.017 | 0.652 |
| 20:00-21:00 | 3 | 7410 | 0.013 | 0.489 | 3 | 7410 | 0.004 | 0.163 | 3 | 7410 | 0.017 | 0.652 |

Projected Daily Trips Table 1.0

3.12 The typical AM and PM hour trip generation can also be derived from the TRICS 2021(b) database and is further summarised within Table 2.0 below.

| 3627Sq metre Industrial Unit | AM Peak | | PM Peak | |
|---|---|---|---|---|
| | Arrivals | Departures | Arrivals | Departures |
| | 24 | 5 | 5 | 21 |

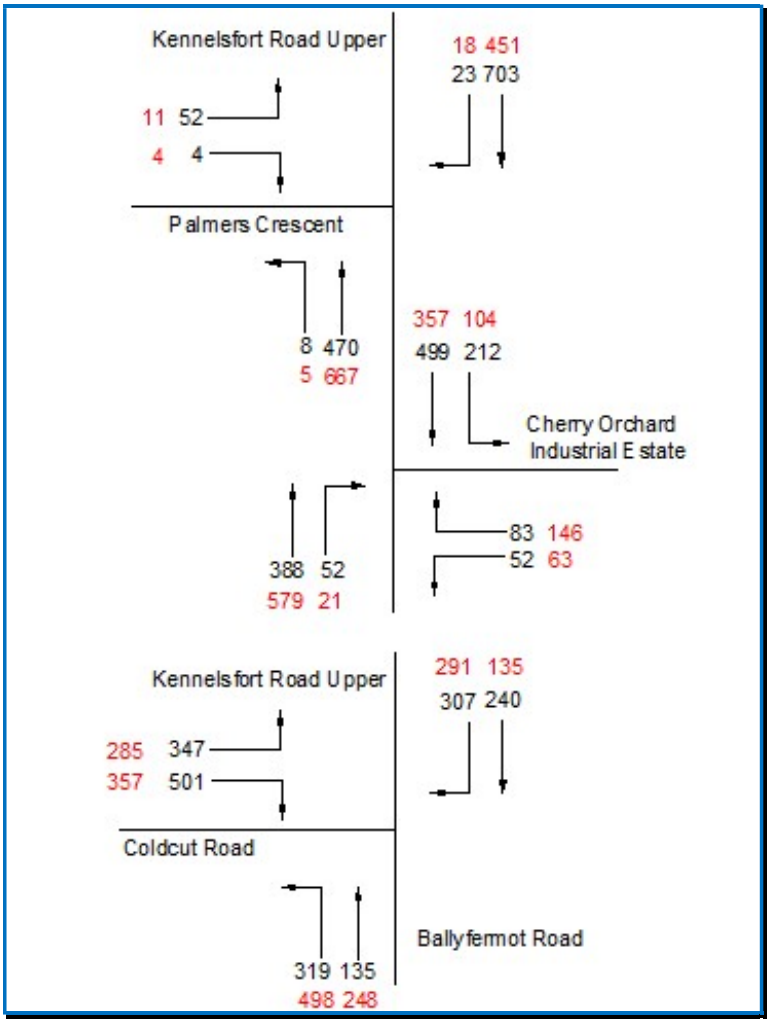
Industrial Unit Peak Hour Trips Table 2.0

3.13 In order to determine the extent of traffic turning movements within road links and junctions in this area full classified traffic surveys were then carried out within the following road liks and junctions:

- Kennelsfort Road Upper / Palmers Crescent
- Kennelsfort Road Upper / Cherry Orchard Industrial Estate
- Kennelsfort Road Upper / Ballyfermot Road / Coldcut Road signal junction

3.14 A copy of these traffic surveys is attached within Appendix 1.0. The periods over which the traffic counts were carried out are within a neutral traffic month with schools and colleges being attended and outside of the summer holidays. Furthermore, these periods were chosen for the reason that over this time period the AM and PM peak traffic conditions can be identified.

3.15 These traffic surveys identified the peak hour traffic periods within this area as being 0815hrs – 0915hrs in the AM and 1630hrs – 1730hrs being the PM peak hour. Details of these recorded existing AM (in black) and PM (in red) peak hour traffic periods are shown in Figures 1.0 below.




Existing AM and PM Peak Hours Figure 1.0

Existing Public Transport Provision.

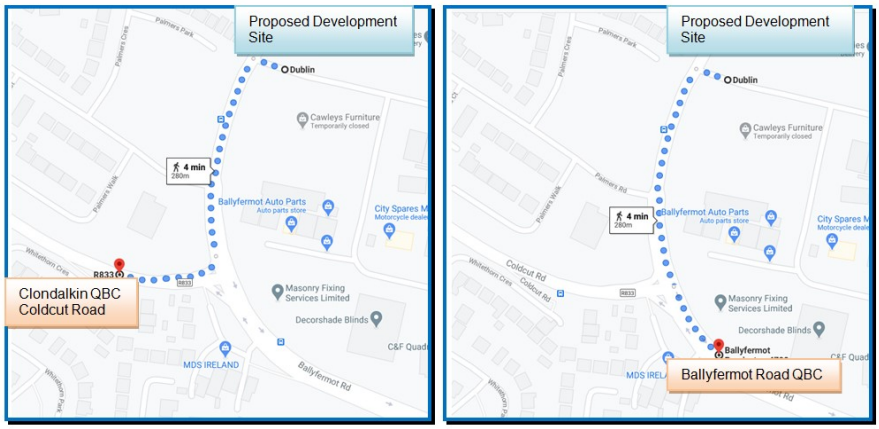
3.16 The proposed development site is located close to a series of Dublin Bus stops on Kennelsfort Road Upper which provide good quality public transport links. These stops are within 2-to-3-minute walk from the proposed 144 residential apartment development site. Table 3.0 below indicates the operation and frequency of the various bus routes on Kennelsfort Road Upper.

| Dublin Bus | Monday to Friday | Saturday | Sundays and Bank Holidays |
|---|---|---|---|
| Route 18 Palmerstown to Sandymount | From 0610hrs to 2330hrs every 10 to 25mins | From 0630hrs to 2320hrs every 20 to 20mins | From 0830hrs to 2320hrs every 20 to 30mins |
| Route 26 From Liffey Valley to Merrion Square | From 0715hrs to 2320hrs every 15 to 30mins | From 0730hrs to 2320hrs every 25 to 20mins | From 0810hrs to 2330hrs every 30mins |

Existing Bus Routes on Kennelsfort Road Upper Table 3.0

3.17 In addition, the proposed development site is less than a 350metre walk of the Clondalkin and Ballyfermot Quality Bus Corridor (QBC) which is located less than 4 minutes to the south and west of the proposed residential development site.

3.18 The proximity of the Clondalkin QBC to the development site is shown within Map 2.0 below with the extent of this 4-minute walking distance between the proposed development site and this QBC shown dotted in blue.




Proximity of Development Site to Clondalkin QBC Map 2.0

3.19 This QBC currently operates the 26, 40 and 76 bus routes with the frequency of these services outlined within Table 4.0 below.

| Dublin Bus | Monday to Friday | Saturday | Sundays and Bank Holidays |
|---|---|---|---|
| Route 26 From Liffey Valley to Merrion Square | From 0715hrs to 2320hrs every 15 to 30mins | From 0730hrs to 2320hrs every 25 to 20mins | From 0730hrs to 2330hrs every 30mins |
| Route 40 From Liffey Valley to Charlestown Shopping Centre via QBC | From 0650hrs to 2320hrs Every 15mins then 10 to 12mins until 1915hrs | From 0605hrs to 2320hrs Every 10 to 15mins | From 0730hrs to 2320hrs Every 15mins |
| Route 76 From Tallaght to Chapelizod via QBC | From 0630hrs to 2330hrs every 20mins | From 0700hrs to 2330hrs every 30mins | From 0930hrs to 2330hrs every 30mins |

Existing Bus Routes on Clondalkin/ Ballyfermot Road QBC Table 4.0

3.20 The Clondalkin/Ballyfermot Road QBC is identified by the National Transport Authority within their Bus Connects Report of 2018 as a core bus route with the objective …. *"to fundamentally transform Dublin's bus system, so that journeys by bus will be fast, reliable, punctual, convenient and affordable in addition to radically enhancing our cycling infrastructure."*

3.21 Bus Connects Dublin is a programme of integrated actions which, together, will deliver a bus system that will enable more people to travel by bus than ever before, and allow bus commuting to become a viable and attractive choice for employees, students, shoppers and visitors. Many of these initiatives are already underway including the core bus corridor project and the Dublin area bus network review. But it is not just the bus system that will be transformed under Bus Connects Dublin.

3.22 The same corridors that are important for buses are also the main cycling routes into the city centre. Bus Connects Dublin will see safe cycling facilities provided along each corridor, segregated as far as practicable from other traffic. The cycling infrastructure delivered under this programme will form the core of the region's cycling network and deliver a radical step-change in cycling facilities in Dublin.

3.23 Bus Connects Dublin provides the foundation to this overall transport system, with the revised bus system projected to carry the majority of passengers across the region and provide key linkages to serve the needs of Dublin into the future. Bus Connects Dublin aims to overhaul the current bus system in the Dublin region by:

- building a network of new bus corridors on the busiest bus routes to make bus journeys faster, predictable and reliable.
- completely redesigning the network of bus routes to provide a more efficient network, connecting more places and carrying more passengers.
- developing a state-of-the-art ticketing system using credit and debit cards or mobile phones to link with payment accounts and making payment much more convenient.
- implementing a cashless payment system to vastly speed up passenger boarding times.
- revamping the fare system to provide a simpler fare structure, allowing seamless movement between different transport services without financial penalty.
- implementing a new bus livery providing a modern look and feel to the new bus system.
- rolling out new bus stops with better signage and information.
- increasing the provision of additional bus shelters, and transitioning - starting now - to a new bus fleet using low emission vehicle technologies.

3.24 The Clondalkin/Ballyfermot QBC is within the National Transport Agency Liffey Valley to Dublin City Centre Bus Connect Route 7 which specific to the location of the development site proposes improved public transport links to Coldcut Road to Le Fanu Road and Coldcut Road, Ballyfermot Road. It is proposed to modify the Coldcut Road/Liffey Valley Entrance Road to accommodate the following lanes:

- Bus lanes and segregated cycle tracks in each direction on Coldcut Road (westbound and eastbound); and
- Three general traffic lanes (westbound, eastbound and right turn lane for accessing Liffey Valley). As Coldcut Road crosses over the M50, the carriageway width is restricted.

3.25 To overcome this restriction and maintain bus priority over this section, it is proposed to provide Signal Controlled Priority on both sides of the bridge crossing.

3.26 To accommodate these changes, it is proposed to utilise limited land take along the green space to the east of the existing structure.

3.27 Between this bridge crossing and the junction with Ballyfermot Road, it is intended to maintain one bus lane and general traffic lane in each direction.

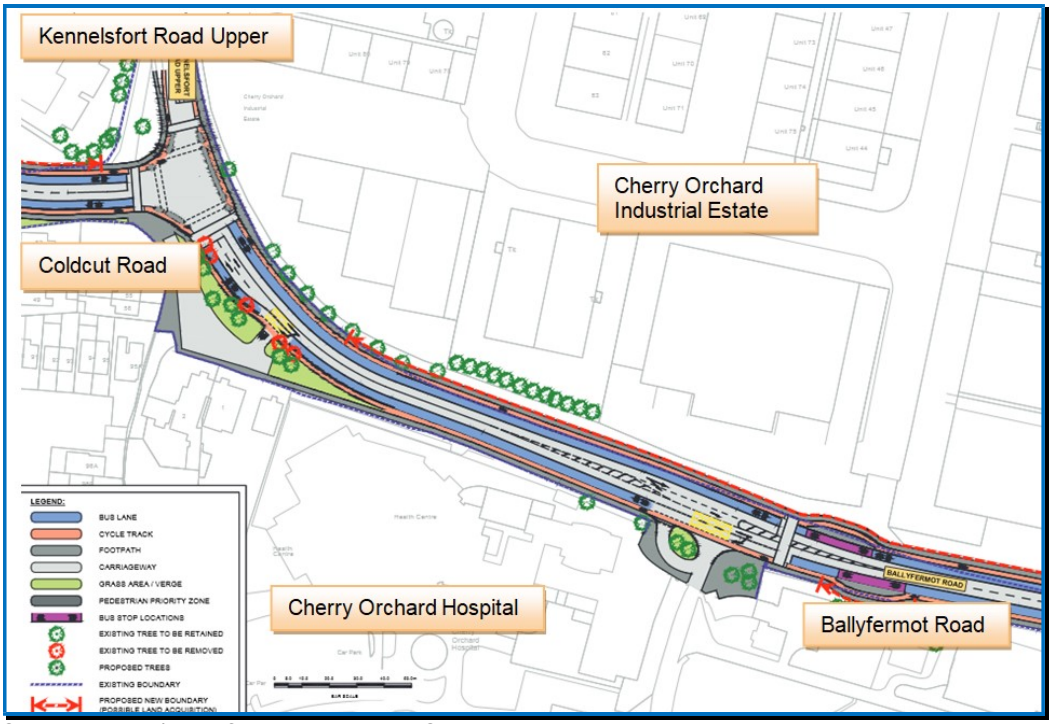
3.28 To accommodate these changes, it is intended to utilise limited land take along the green space adjacent to Palmers Walk, Palmers Court and Palmers Drive area. On Ballyfermot Road, it is proposed to maintain one bus lane, one general traffic lane and a cycle track in each direction. To accommodate this improved infrastructure, it will be necessary to acquire limited land take at the following locations:

- Cherry Orchard Industrial Estate.
- Cherry Orchard Hospital.
- Cherry Orchard Filling Station entrance and
- At junction with Le Fanu Road.

3.29 It is also proposed to amalgamate the main Ballyfermot Road and the access road serving No. 430 – No. 512 Ballyfermot Road by removing the existing boundary fence and landscaping. This would provide sufficient space to improve the existing public transport infrastructure.

3.30 Urban Realm works along with additional tree planting and provisions for parallel parking are proposed where the access road will be modified. It is also proposed to modify the area outside of the Ballyfermot Community Civic Centre to accommodate the improved infrastructure.

3.31 The extent of improved public transport and cycle facilities within Coldcut Road and the Ballyfermot Road is shown within the National Transport Agency Map Extract 3.0 extract below.




Coldcut Road / Ballyfermot Road Bus Connect Proposals Map 3.0

3.32 As such, the proposed residential apartment development can be considered as being located within an area that is highly accessible to existing and future public transport and cycling links.

Cycle Proposals and Links.

3.33 It is proposed to provide 310 bicycle spaces within the development site of which 226 are for residents and 84 bicycle spaces for visitors. In addition, it is also proposed to provide a dedicated cycle lane adjacent to the proposed pedestrian footpath along the frontage of the site can connect with the existing cycle lanes on Kennelsfort Road Upper.

3.34 This cycle proposals could in time be developed to connect with the National Transport Agency, Greater Dublin Area Cycle Network Plan which is a proposal comprising the Urban Network, Inter-Urban Network and Green Route Network for each of the seven Local Authority areas made up of the Greater Dublin Area which includes Dublin City Council, South Dublin County Council, Dun Laoghaire Rathdown County Council, Fingal County Council, Meath County Council, Kildare County Council and Wicklow County Council.

3.35 The Brief for this project requires the Cycle Network Plan to identify and determine in a consistent, clear and logical manner the following cycle networks within the Greater Dublin Area.

3.36 The Irish Government, the NTA and various State Agencies are committed to ensuring that cycling as a transport mode is supported, enhanced and exploited, in order to achieve strategic objectives and reach national goals.

3.37 Current policy is set out in various documents produced by the Department of Transport, Tourism & Sport and its Agencies. However, the National Cycle Policy Framework (NCPF) is the key document that sets out 19 specific objectives, and details the 109 individual but integrated actions, aimed at ensuring that a cycling culture is developed in Ireland to the extent that, by 2020 with 10% of all journeys being made by bike.

3.38 The NCPF proposes a comprehensive package of planning/infrastructure and communication/education measures and emphasises the need for stakeholder participation and adequate funding of the required initiatives.

3.39 The NCPF requires that cycle-friendly planning principles be incorporated in all national, regional, local and sub-local plans. These ambitious targets can only be achieved if a much higher proportion of trips by bicycle is undertaken in urban areas, in particular within the GDA, where the use of bicycle for many types of trips is already much more common.

3.40 In order to ensure that investments are focused in an efficient manner towards reaching these ambitious targets, the NTA and the Local Authorities within the GDA need to know what bicycle facilities are currently available, where they are missing sections, what is their condition and what improvements are likely to be required.

3.41 In addition, a strategic cycle network map of the GDA needs to be prepared which will help the NTA in allocating funding towards the implementation of strategically important schemes. Information outlined in this report will allow cycle infrastructure projects to be prioritised in terms of the importance to the strategic network and the likely cycle demand for such a scheme.

## 4.0 Proposed Development Trip and Traffic Generation.

4.1 In order to assess the likely traffic associated with the proposed 144 Build to Sell residential apartment development we have again reviewed the TRICS 2021(b) trip rate database (Trip Rate Information Computer System).

4.2 TRICS 2021(b) is a database that uses survey information to estimate traffic generation for planning purposes. The database consists of over 8,500 traffic surveys, which therefore yields empirical rather than theoretical trip rate generation figures.

4.3 The TRICS 2021(b) database output file for the proposed 144 residential units derived from similar residential sites in Ireland is attached within Appendix 2.0 to this report. A summary of the TRICS 2021(b) output file for this proposed residential development is shown in Table 5.0 below.

TOTAL VEHICLES | Estimate TRIP rates

Survey Start/End: 07:00-19:00
Trip rate parameter range available: 20 - 332 (units: )
State TRP Figure & Extrapolate Results | ON
Estimated TRIP rate value per 144 DWELLS
Estimated TRIP rates shown in shaded column (for 144 DWELLS)

| TRIP RATE VALUE PER 1 DWELLS | ARRIVALS Total Rate: 1.149 Peak: 17:00-18:00 | | | Total 165.345 | DEPARTURES Total rate: 1.232 Peak: 08:00-09:00 | | | Total 177.519 | TOTALS Total rate: 2.381 Peak: 08:00-09:00 | | | Total 342.864 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. Days | Ave. DWELLS | Trip Rate | Estimated Trip rate | No. Days | Ave. DWELLS | Trip Rate | Estimated Trip rate | No. Days | Ave. DWELLS | Trip Rate | Estimated Trip rate |
| 00:00-01:00 | | | | | | | | | | | | |
| 01:00-02:00 | | | | | | | | | | | | |
| 02:00-03:00 | | | | | | | | | | | | |
| 03:00-04:00 | | | | | | | | | | | | |
| 04:00-05:00 | | | | | | | | | | | | |
| 05:00-06:00 | | | | | | | | | | | | |
| 06:00-07:00 | | | | | | | | | | | | |
| 07:00-08:00 | 14 | 68 | 0.046 | 6.614 | 14 | 68 | 0.191 | 27.507 | 14 | 68 | 0.237 | 34.121 |
| 08:00-09:00 | 14 | 68 | 0.073 | 10.522 | 14 | 68 | 0.248 | 35.775 | 14 | 68 | 0.321 | 46.297 |
| 09:00-10:00 | 14 | 68 | 0.079 | 11.424 | 14 | 68 | 0.087 | 12.476 | 14 | 68 | 0.166 | 23.900 |
| 10:00-11:00 | 14 | 68 | 0.038 | 5.411 | 14 | 68 | 0.063 | 9.019 | 14 | 68 | 0.101 | 14.430 |
| 11:00-12:00 | 14 | 68 | 0.053 | 7.666 | 14 | 68 | 0.068 | 9.770 | 14 | 68 | 0.121 | 17.436 |
| 12:00-13:00 | 14 | 68 | 0.067 | 9.620 | 14 | 68 | 0.085 | 12.175 | 14 | 68 | 0.152 | 21.795 |
| 13:00-14:00 | 14 | 68 | 0.091 | 13.077 | 14 | 68 | 0.081 | 11.724 | 14 | 68 | 0.172 | 24.801 |
| 14:00-15:00 | 14 | 68 | 0.113 | 16.234 | 14 | 68 | 0.080 | 11.574 | 14 | 68 | 0.193 | 27.808 |
| 15:00-16:00 | 14 | 68 | 0.100 | 14.430 | 14 | 68 | 0.076 | 10.973 | 14 | 68 | 0.176 | 25.403 |
| 16:00-17:00 | 14 | 68 | 0.112 | 16.084 | 14 | 68 | 0.070 | 10.071 | 14 | 68 | 0.182 | 26.155 |
| 17:00-18:00 | 14 | 68 | 0.195 | 28.109 | 14 | 68 | 0.082 | 11.875 | 14 | 68 | 0.277 | 39.984 |
| 18:00-19:00 | 14 | 68 | 0.182 | 26.154 | 14 | 68 | 0.101 | 14.580 | 14 | 68 | 0.283 | 40.734 |

Proposed 144 Residential Unit Development. Table 5.0

4.4 The AM peak hour and PM peak hour trips generation associated with the proposed 144 residential apartment development is further summarised and shown within Table 6.0 below:

| Proposed 144 Apartment Development Trips | AM Peak | | PM Peak | |
|---|---|---|---|---|
| | Arrivals | Departures | Arrivals | Departures |
| | 11 | 37 | 29 | 13 |

144 Residential Units AM/PM Peak Hour Trips. Table 6.0

4.5 From Table 6.0 above, the proposed 144-unit Build to Sell residential development has been identified as generating very limited traffic levels during the AM and PM peak hour traffic periods.

Estimation of Traffic Growth.

4.6 We do not consider that the level of car ownership will fluctuate significantly at this site when completed and therefore the traffic at the site could reasonably be expected to experience very limited traffic growth in relation to time.

4.7 Car ownership would need to dramatically increase at the site in order to have a significant effect on the capacity of the surrounding road network. We do not consider this scenario likely and therefore we have not taken account for traffic growth in the estimated levels of traffic to and from the development site over time.

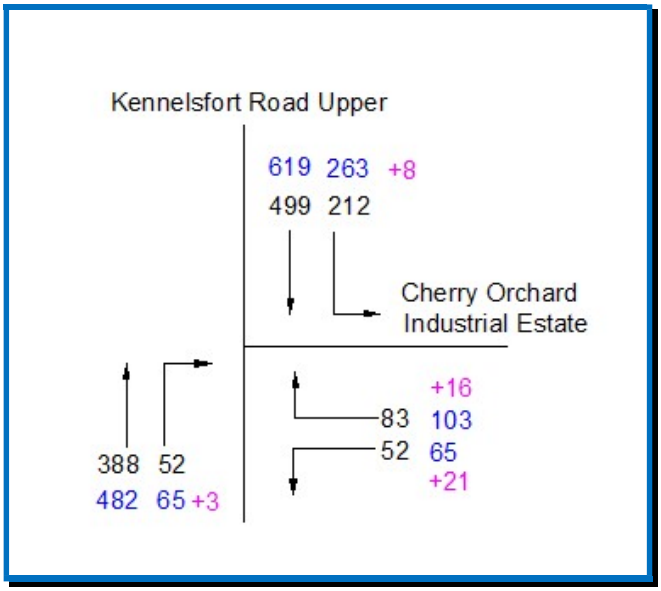
4.8 In contrast to the above, the levels of traffic on the surrounding road network will increase over time. In Table 6.2 of the 'Project Appraisal Guidelines for National Roads Units 5.3 – Travel Demand Projections published by Transport Infrastructure for Ireland traffic growth projections are provided.

4.9 This publication produces link-based traffic growth rates from 2016 to 2030, 2030 to 2040 and 2040 to 2050 within Low, Central and High Sensitivity Growth Rates. Based on Central growth rates between 2016 and 2030 traffic growth of 1.62% per annum is projected with traffic growth of 1.51% per annum projected between 2030 and 2040 for the Dublin Metropolitan Area.

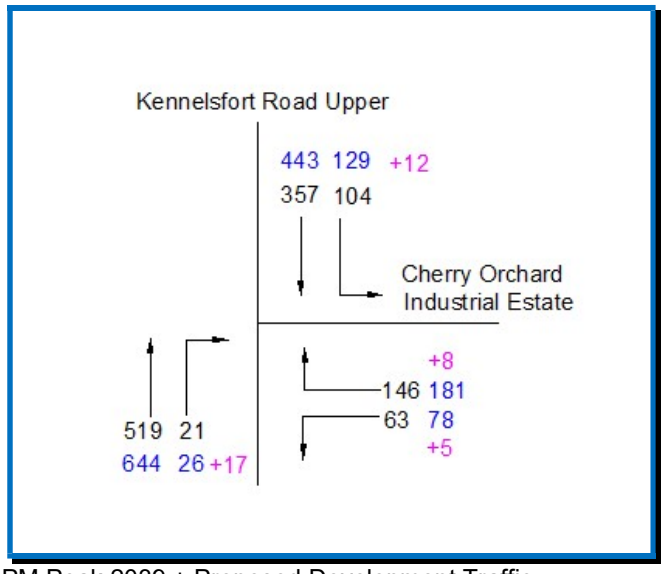
4.10 In order to assess a worst-case traffic growth situation, we have added all the above traffic growth projections (23.31% traffic growth say 24%) from the projected completion year of 2024 to 2039 (15 years after completion) onto the recorded traffic on the surrounding road network.

4.11 It should be noted that the application of an annual growth factor to a peak hour traffic situation can be regarded as excessive and is generally only undertaken by traffic engineers to identify a 'worst case' situation for traffic modelling purposes.

4.12 In addition, we have assigned all the development traffic to the key junction, this being Kennelsfort Road Upper and the Cherry Orchard Industrial Estate junction. The distribution of all of the traffic associated with the proposed apartment development at completion and the future years up to 2039 derived from the above projections is outlined within Figures 2.0 and 3.0 below with the distribution based on the recorded AM and PM recorded traffic turning movements on Kennelsfort Road Upper and Cherry Orchard Industrial Estate.




AM Peak 2039 + Proposed Development Traffic. Figure 2.0




PM Peak 2039 + Proposed Development Traffic. Figure 3.0

Legend:
2021 Baseline Traffic Surveys
2039 Traffic Growth Projections to 2039
+13 144 Residential Unit Development Traffic

## 5.0 Proposed Site Access Arrangements.

5.1 It is proposed to access the residential apartment development site from the Cherry Orchard Industrial Estate by means of a new simple priority T junction located towards the eastern boundary of the application site. The existing access points would be closed with these areas incorporated within the development.

5.2 This access would lead to a 6.00metre internal access route. Junction radii of 4.50 metres would be provided within the bellmouth of the site access where it connects with the Cherry Orchard Industrial Estate Road.

5.3 The proposed site access and internal access route accord with the standards set out within the Design Manual for Urban Roads and Streets (DMURS).

5.4 DMURS places the emphasis not on road link or junction capacity but the sharing of the available road space. DMURS was launched by the Department of Transport and the Department of Environment in March 2013 with the focus on pedestrians, cyclists, and public transport.

5.5 The DMURS 2019 manual sets out design guidance and standards for constructing new and reconfiguring existing urban roads, streets and access points in Ireland, incorporating good planning and design practice.

5.6 The manual aims to end the practice of designing streets as traffic corridors, and instead focus on the needs of pedestrians, cyclists and public transport users.

5.7 The layout of proposed residential site access being designed to reflect the DMURS standards in terms of road widths and alignment which is shown within drawings set out within SHIPSEYBARRY Architects Design Brief.

5.8 The extent of visibility sightlines within the proposed site access also fully accords with Table 4.2 of DMURS with 2.4 metres by 49.0 metres provided within the proposed site access into the leading and non-leading traffic directions of the Cherrywood Industrial Estate Road.

5.9 In addition, this site access can incorporate pedestrian and cyclist priority within the bellmouth of this site access at the application stage, where it connects with the upgraded existing public footpath and new cycleway along the Cherry Orchard Industrial Estate Road.

## 6.0 Capacity of Kennelsfort Road Upper/Cherry Orchard Industrial Estate Road.

6.1 In order to assess the impact of the traffic associated with the proposed 144 residential unit development may have on the adjacent Kennelsfort Road Upper with the Cherry Orchard Industrial Estate Road junction we have modelled this junction using the computer-modelling program PICADY9.

6.2 PICADY9 output results consist of tables of demand flows for each time segment of the time-period analysis. These tables contain start and finish times for each arm, traffic demand data, capacity, ratio of flow to capacity findings, start queue length, end queue length, and queuing delay.

6.3 This traffic-modelling period covers the projected critical AM and PM peak period at 2039. A copy of the AM and PM peak hour PICADY9 data and results are as Appendix 3.0 to this report with a summary of the output results shown within Table 7.0 and Table 8.0 below:

**08:45 - 09:00**

| Stream | Total Demand (PCU/hr) | Capacity (PCU/hr) | RFC | Throughput (PCU/hr) | End queue (PCU) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|
| **B-C** | 95 | 444 | 0.213 | 95 | 0.3 | 11.327 | B |
| **B-A** | 131 | 270 | 0.485 | 131 | 1.0 | 28.425 | D |
| **C-AB** | 96 | 519 | 0.185 | 96 | 0.3 | 9.386 | A |
| **C-A** | 509 | | | 509 | | | |
| **A-B** | 298 | | | 298 | | | |
| **A-C** | 682 | | | 682 | | | |

AM Peak at 2039 with 144 Residential Apartment Development. Table 7.0

**17:00 - 17:15**

| Stream | Total Demand (PCU/hr) | Capacity (PCU/hr) | RFC | Throughput (PCU/hr) | End queue (PCU) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|
| **B-C** | 91 | 462 | 0.198 | 91 | 0.3 | 10.674 | B |
| **B-A** | 119 | 266 | 0.447 | 119 | 0.9 | 26.855 | D |
| **C-AB** | 58 | 530 | 0.109 | 58 | 0.2 | 8.378 | A |
| **C-A** | 699 | | | 699 | | | |
| **A-B** | 155 | | | 155 | | | |
| **A-C** | 682 | | | 682 | | | |

PM Peak at 2039 with 144 Residential Apartment Development. Table 8.0

| | |
|---|---|
| Arm A | Kennelsfort Road Upper (North) |
| Arm B | Cherry Orchard Industrial Estate |
| Arm C | Kennelsfort Road Upper (South) |

6.4 From the above summary Tables 7.0 and Table 8.0 above it is indicated that the Kennelsfort Road Upper at its junction with the Cherry Orchard Industrial Estate Road can accommodate the traffic growth at 2039 and 100% of the projected levels of traffic associated with the proposed 144-unit residential apartment development.

6.5 These tables also indicate that during the AM and PM peak traffic periods the proposed junction experiences almost free flow traffic conditions with no material queuing projected within this junction, operating with reserve capacity of over 50% during the critical peak traffic period at 2039.

6.6 The relative Level of Service within the proposed site access at its junction is identified as C within the above PICADY9 assessment representing "stable flow urban traffic conditions", as set out within the Highway Capacity Manual.

6.7 Urban Level of Service gauges, in a qualitative manner, the extent of congestion within a road link. Variables such as travel time and traffic speed form part of the qualitative description.

6.8 Level of Service A represents almost free flow traffic conditions falling to a Level of Service F indicating the road link is over capacity.

## 7.0 Car Parking Provision.

7.1 The extent of car parking provision within a proposed residential site is discussed within Table 11.24 of the South Dublin Development Plan 2016 to 2022.

7.2 Table 11.24 indicates that the number of spaces provided for any particular residential development should not exceed the maximum provision. Furthermore, the maximum provision should not be viewed as a target and a lower rate of parking may be acceptable subject to:

- The proximity of the site to public transport and the quality of the transport service it provides.
- The proximity of the development to services that fulfil occasional and day to day needs.
- The existence of a robust and achievable Workforce Management or Mobility Management Plan for the development.
- The ability of people to fulfil multiple needs in a single journey.

7.3 The proposed residential development units made up of 144 apartment units, of which 72 are one bedroom with 72 two-bedroom apartments. The extent of maximum car parking based on the proposed development being within Zone 2 of the Development Plan is shown outlined within Table 11.24 of the current South Dublin Development Plan 2016 to 2022 which suggests 1 space per 2-bedroom apartment and 0.75 spaces per 1-bedroom apartment.

7.4 Based on these maximum parking standards some 126 car parking spaces would be required to serve the development.

7.5 It is proposed to provide 65 car parking spaces and 310 resident and visitor bicycle parking spaces within the development site at surface level some 52% in compliance with the development plan car parking standards.

7.6 This extent of parking is similar to that previously permitted by An Bord Pleanala for a 502-apartment scheme at Airton Road in Tallaght with 202 spaces granted under Planning Ref: 306705-20.

7.7 Considering the site proximity to a public transport corridor and dedicated cycle provision we consider this level of car parking within the site to be sufficient to serve this residential apartment proposal.

7.8 We consider the provision of a parking per unit to be excessive within the application site. This view is based on the most recent nation publication The Design Standards for New Apartments published by the Department of Housing, Planning and Local Government in March 2018.

7.9 These guidelines encourage a balance between excessive parking provision within an apartment complex and the sites proximity to high levels of public transport provision which can reduce car dependency.

7.10 Section 1.10 of this publication suggests ….. ‘*’Remove requirements for car parking where in certain circumstances where there are better mobility solutions’”*…..

7.11 In addition, Section 2.4 of this publication further suggests that where potential apartment development sites are within …..''Central and/or Accessible Urban Locations''…factors such as the

> *….''Sites within walking distance (i.e. up to 10 minutes or 800-1000metres of a high-capacity urban transport stops (such as DART or LUAS) and*
>
> *Sites within easy walking distance (i.e. up to 5 minutes or 400-500m) to /from high frequency (i.e. min 10-minute peak hour frequency urban bus services'' ..*

should be considered as part of the overall site assessment which we consider includes the extent of parking provision within the site.

7.12 This application site which is adjacent to existing Dublin Bus public transport routes and within 350metres of the Clondalkin/ Ballyfermot Road QBC and in our view fully complies with these new national guidelines and can be classified as a one of the …'Central and /or Accessible Urban Locations' set out within the guidelines.

7.13 This view is further supported when Section 4.19 of the Design Standards for New Apartments is reviewed which in part states ….

> *''the default policy is for car parking provision to be minimized, substantially reduced or wholly eliminated in certain circumstances. These policies above would be particularly applicable in highly accessible areas such as in or adjoining city cores or at a confluence of public transport systems such as rail and bus stations located in close proximity''….*

7.14 Section 4.20 further reinforces these guidelines again, stating the proximity of the potential apartment site should be within a 10-minute walk of a LUAS or DART stop or a high frequency bus route.

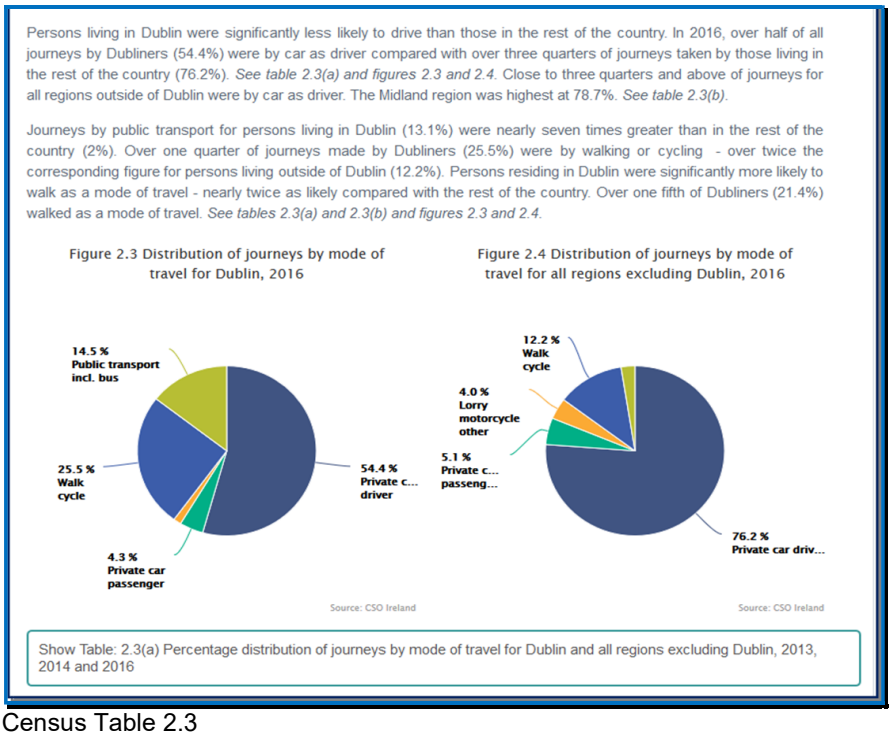
7.15 Section 4.17 of The Design Standards for New Apartments states:

> *"Cycling provides a flexible, efficient and attractive transport option for urban living and these guidelines require that this transport mode is fully integrated into the design and operation of all new apartment development schemes. In particular, planning authorities must ensure that the development proposals in central urban and public transport accessible locations and which otherwise feature appropriate reductions in car parking provision are at the same time comprehensively equipped with high quality cycle parking and storage facilities for residents and visitors.*

Census Data.

7.16 The 2016 Census undertaken by the Central Statistics Office within Profile 6 identified that persons living in Dublin were significantly less likely to drive than those in the rest of the country.

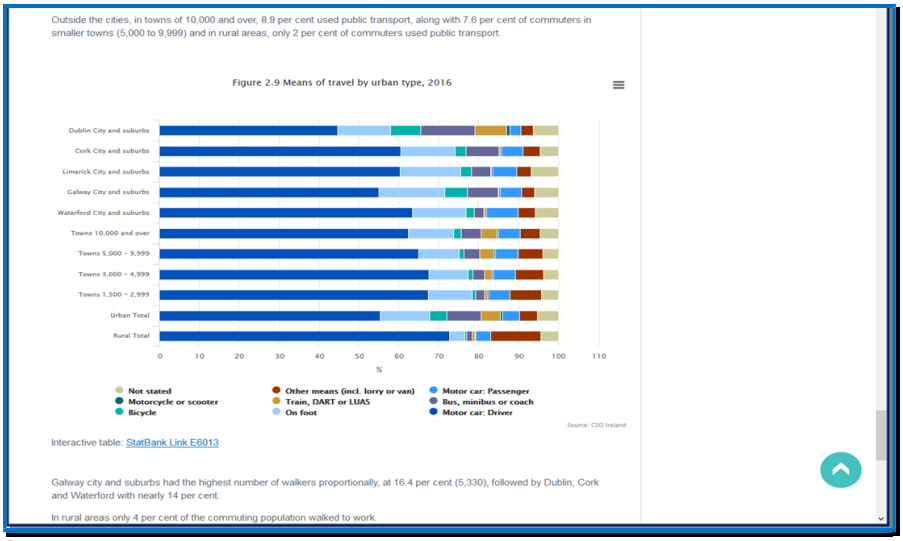
7.17 The percentage distribution of these non-driving journeys is set out within Profile 6.0 at Census Table 2.3 which is shown below.



Census Table 2.3

7.18 Of the 45.6% of non-driving journeys, 14.5% of persons took public transport, 25.5% walked or cycled and 4.3% car shared within 1.3% taking other forms (taxi, vans or motorcycle).

7.19 Figure 2.9 within Profile 6 of the 2016 census also identified that within Dublin City and Suburbs only 44.6% of commuters drive to work and 2.7% are car passengers. A copy of this Census Figure 2.9 is also shown below.



Census Figure 2.9

7.20 The remaining commuters within Dublin City and Suburbs take alternative transport modes with 13.2% walking, 7.6% cycling, 13.6% taking the bus 7.9% taking the train, Dart or LUAS, 3.1% commute by truck, van or motorcycle. 6.4% stated no travel.

7.21 33.7% of households in Dublin City administrative area did not have a car, as recorded in the 2016 Census.

7.22 This census-based data formed a key component within the Design Team's assessment of the parking provision associated with this social and affordable development scheme.

7.23 Specific, to this site, and considering all of the above, it is considered that providing 52% of the development plan parking requirement is more than sufficient to serve this application site. Furthermore, this extent of parking provision promotes the use of alternative modes of travel to and from the site. Thus, encouraging sustainable travel.

7.24 This above view is further supported from discussions with several management companies at the following existing apartment locations within Dublin City:

1. Shanagarry, Milltown
2. Mount St Anne's, Milltown
3. Beacon South Quarter
4. Spencer House
5. Talbot Street
6. Ashtown
7. Clancy Quay

7.25 These management companies have advised that where an existing residential apartment complex is close to a quality public transport corridor many residents within these complexes no longer require a dedicated parking space.

Car Club.

7.26 It is also proposed to operate a Car Club within this site. The Car Club operator would most likely be GoCar with 2 dedicated car club spaces provided within a dedicated car club layby adjacent to the site on the Cherry Orchard Industrial Estate Road for residents and other car club members within the Palmerstown area. A similar car club layby in DunLaoghaire is shown within Photograph 1.0 below.

Car Club Layby in Dun Laoghaire Photograph 1.0

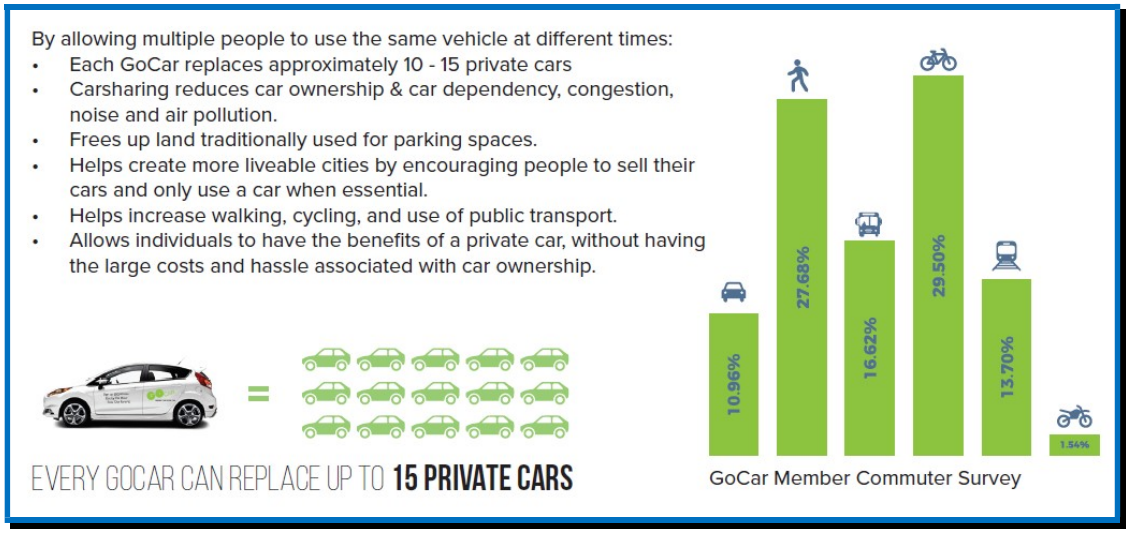
7.27 A copy of correspondence confirming the GoCar intention to provide shared car club parking spaces within the application site is attached within Appendix 4.0.

7.28 Within this development site are included 2 parking spaces which can be used by Car Club members such as GoCar.

7.29 GoCar was launched as a pilot scheme in Cork City in 2008 and the company

> *....."sees itself as part of the mobility solution to creating sustainable parking-less developments in Ireland and have already engaged on a number of developments in which car sharing club vehicles have been used to offer sustainable transport options. With this in mind, we're highlighting that car sharing is just part of the solution in creating sustainable transport in the city and encouraging people to move from car ownership to using multi modal mobility".....*

7.30 GoCar research identified the following:




7.31 GoCar has also identified that including a Car Sharing Club at the planning stage has allowed planners in other European cites to reduce the level of parking per unit.

7.32 The GoCar return to base model is available through online membership who can book a vehicle via the website or mobile phone app. Members unlock the car by phone or GoCard. Fuel, car insurance and maintenance are included.


7.33 Research by GoCar indicates that 80% of their Irish members do not own a car. This research also identified that 29% of members commute to work by bicycle, with 28% travelling to work on foot.

7.34 Over 60% of GoCar members use public transport at least once a week and 50% cycle at least once a week supporting the international research that moving to a car sharing scheme increases the use of public transport.

7.35 Separately, GoCar is doubling its fleet from 750 to 2,500 within the Greater Dublin Area and car manufacturers are moving from sales to direct rentals, so individual car ownership and associated fixed costs and depreciation may see a demise in ownership (and the need for permanent parking) in favour of more flexible use of fleet use and return cars.

7.36 GoCar have ongoing member surveys to determine how effective their service is with the key findings summarised below:

- 59% of GoCar members have used the service to replace a personal vehicle.
- Each GoCar takes 17 cars off Dublin streets.
- 86% of GoCars are used was for personal use.
- 14% of GoCars are for business use.
- 69% of users cite convenience as the biggest advantage of GoCar.

- 30% of members indicate insurance costs as a major issue's car ownership.
- 26% cite general running costs such as maintenance and fuel costs as a major issue deterring car ownership.

7.37 GoCar have further identified that their members do not contribute to long-term commuting as the vehicle must be returned to the original location and as such the cost associated with using GoCar vehicle for commuting purposes means can be prescriptive. The main vehicle use by GoCar members is:

- Day trips.
- Family taxi.
- Shopping and leisure trips.

7.38 GoCar research also identified that their vehicles are used for just 1 to 2 hours a day. Therefore, enabling multiply trips where such a facility would have numerous benefits over the adopted dedicated parking provision model, which includes a reduction in car ownership, reduced unnecessary vehicular travel and a reduction in car ownership.

Cycle Parking.

7.39 In order to further promote travel by means other than private car it is proposed to provide 310 bicycle parking spaces within the development site of which 226 would be available for residents with 84 bicycle spaces available for visitors.

7.40 This extent of cycle parking for the development is in part based on the standard set out in the Guidelines for Planning Authorities, Design Standards for New Apartments March 2018 which sets out 1 space per bedroom and 0.5 visitor cycle spaces per residential unit.

7.41 Based on the above standards 216 bicycle parking spaces would be required for residents and 72 bicycle spaces for visitors. The design team consider the over provision of cycle parking spaces as against providing additional car parking spaces will further encourage sustainable travel.

Mobility Management Travel Plan.

7.42 In addition, to the above, a Mobility Management Travel Plan can be operated by Management Company within the development site to both encourage and facilitate tenants to travel by sustainable means.

7.43 This Mobility Management Travel Plan would further reduce the demand for travel by car and, by default car parking demand.

7.44 A Mobility Management Plan is a travel demand measure to promote alternative sustainable modes of transport, reduce the attractiveness of private car use, and to mitigate against traffic congestion in urban areas by providing for the transportation needs of people in an orderly and planned manner.

7.45 This Mobility Management Plan seeks to optimise the potential to use alternative modes to the private car, such as walking, cycling and public transport.

7.46 A key objective of the Mobility Management Plan is to promote and encourage a high level of permeability to and through the site, in particular for pedestrians and cyclists. The Mobility Management Plan can enable the following benefits:

- Improved access requirements to employment, education and other social infrastructure
- Optimise permeability for walking and cycling

- Reduced traffic generation compared to similar developments without the same level of pedestrian and cycle connections and access to public transport
- Reduced car parking demand and reduced congestion on the local road network due to lower demand for private transport and /or more efficient use of private motor cars
- Improved safety for pedestrians
- A reduction in car parking and car set down demand, resulting in improved operational efficiency and safety for all residents
- Improved public image for the development sense of place and a desirable place to live
- Improved health and well being for residents

7.47 This plan will be prepared within 6 months of completion when it is expected the development would be fully occupied which would enable detailed travel surveys to be carried out by the operator in conjunction with residents.

7.48 A series of measures will then be developed using this information to further encourage sustainable travel away from private car travel towards alternative methods further reducing for car ownership.

7.49 Welcome travel information packs will form part of the marketing material for the site and will be distributed to all new residents within the development at point of sale.

7.50 It is envisaged that the packs will contain information about public transport, walking and cycling routes, car parking management as well as information about local services within reasonable comfortable walking distance. The packs will contain specific information on walking and cycling distances to key destinations.

7.51 The information packs will also promote the benefits of walking and cycling including increased concentration, better awareness of road and personal safety issues, decreased traffic congestion and associated amenity impacts, environmental benefits, interpersonal and social benefits, financial benefits.

7.52 In relation to cycling specifically the pack will inform apartment residents of the location and accessibility of secure bicycle parking at each block. The pack will also publicise the Government Bike to Work Scheme (www.biketowork.ie).

7.53 In relation to public transport the packs will publicise the availability of Real Time Information on the Dublin Bus website as well as the availability of the National Journey Planner (available on the Transport for Ireland website), which provides journey planning, timetable, and travel information from all public transport providers in the area.

7.54 A key consideration in the design of this development is the delivery of a high level of permeability through the site, particularly for pedestrians and cyclists, by providing connections to existing and upgraded public transport services and local services.

7.55 In summary, from a travel demand and mobility management perspective, the site is ideally located adjacent to transport infrastructure to support the use of more sustainable transport modes such as walking, cycling and public transport services.

7.56 Furthermore the Mobility Management Travel Plan would be a live document with ongoing updates by the operator based on the experience of measures implemented and future sustainable targets in conjunction with tenants of this residential apartment development.

7.57 The operation of a Mobility Management Travel Plan within this development site fully complies within the objectives of South Dublin County Council.

Modal Split.

7.58 The 2016 census identifies that the modal split for the private car within Dublin City was over 30% which is not unexpected given the shift towards public transport and other forms of travel.

7.59 In addition, the TRICS data included within this report identifies limited vehicular trip generation with this extent of trips confirmed from traffic surveys undertaken at existing residential development within the Dublin area.

7.60 Given the development site urban location and its proximity to good quality public transport links this site would also operate with a private vehicle modal split of some 30% with the remaining transport modes being by public transport, walking or cycling.

7.61 Considering all the above, we respectfully suggest that the provision of 65 car parking spaces, 310 bicycle parking spaces and 8 motorcycle spaces and 2 car club parking spaces is more than adequate to serve this Build to Sell development.

## 8.0 Compliance with Design Manual for Urban Roads and Streets 2019.

8.1 The proposed site access arrangements are generally shown within within drawings set out within SHIPSEYBARRY Architects Design Brief which connects with the internal site access route with 2.0 metre pedestrian footpaths dished at locations to enable provision for the disabled and tactile paving for the visually impaired. The layout of this junction and internal site access route can be designed to meet the design criteria set out with the Design Manual for Urban Roads and Streets 2019 (DMURS).

8.2 As previously discussed, DMURS places the emphasis not on road link or junction capacity but the sharing of the available road space.

8.3 The DMURS 2019 manual sets out design guidance and standards for constructing new and reconfiguring existing urban roads, streets and access points in Ireland, incorporating good planning and design practice.

8.4 The manual aims to end the practice of designing streets as traffic corridors, and instead focuses on the needs of pedestrians, cyclists and public transport users. DMURS seeks that designers consider first:

1. Pedestrians
2. Cyclists
3. Public Transport
4. and finally, the private motor car

8.5 The proposed site layout places a priority on sustainable forms of travel which includes provision for dedicated pedestrian route connecting the various apartment blocks with the public routes. These routes can also be used by cyclists. Thus, maximizing the connectivity between the application site and the public realm.

8.6 This priority can be achieved by the use of various materials and finishes, promotion of shared areas and pedestrian priority within the various internal links within the application site.

8.7 The proposed site layout ensures a balance between the various users accessing the site from the public realm and provides a transition from this realm to promote a real sense of place within the site as set out within the objectives of DMURS.

## 9.0 Other Traffic Matters.

Road Safety Audit.

9.1 While a road safety audit is not a requirement under the Planning Act, we suggest the Board might consider conditioning such an audit if they are minded to grant planning permission for this development.

9.2 The findings and recommendations of the audit to be agreed with South Dublin County Council.

Heavy Vehicle Swept Path Assessments.

9.3 The proposed residential apartment site can also be accessed by heavy vehicles for delivery, refuse collection or emergency purposes.

9.4 A swept path assessment for an emergency vehicle and refuse cart type vehicle has been undertaken and is shown within drawings set out within SHIPSEYBARRY Architects Design Brief. These swept path assessments indicate the inbound, reversing and outbound turning manoeuvre within the internal site access routes, confirming that a heavy vehicle be they an emergency vehicle, refuse cart or service vehicle can undertake these manoeuvres within the internal site area.

Off Site Works.

9.5 Where off-site works are proposed to the public roads and public footpaths to facilitate pedestrian or vehicular access to the application site these will be designed in accordance with the South Dublin County Council standards set out within Construction Standards for Roads and Street Works.

Construction Management Plan.

9.6 We would advise that the Construction & Demolition Traffic Management Plan can be conditioned as no contractor has been appointed and they will determine how the phasing of the construction programme is advanced should planning permission be granted.

## 10.0 Response to Technical Matters raised by South Dublin County Council Roads Department.

10.1 The South Dublin County Council report dated 9th July 2021which formed part of the pre application submission in relation to this Strategic Housing Development (An Bord Pleanala Ref: 310483-21) contains a technical traffic report from the Roads and Transportation Department.

10.2 The keys sections of this report are reproduced in italics below with our response following each technical item raised within that report.

> *The applicant has provided a Traffic and Transport Assessment. Roads has provided comments regarding this TTA and has some concerns regarding the data used, due to the years used and the lack of traffic growth factors. A revised TTA is requested.*

10.3 The base traffic survey undertaken in 2021 identified the AM and PM peak traffic periods on the road network and within the adjacent road junctions in the vicinity of the application site. This traffic data formed the basis of a series of projected future year traffic scenarios from 2021 to the projected development being completed in 2024 and 15 years post completion at 2039.

10.4 Included within these future year traffic scenarios are traffic growth projections derived from Table 6.2 of the 'Project Appraisal Guidelines for National Roads Units 5.3 – Travel Demand Projections published by Transport Infrastructure for Ireland. Based on this publication are link-based traffic growth rates from 2016 to 2030, 2030 to 2040 and 2040 to 2050 within Low, Central and High Sensitivity Growth Rates.

10.5 The proposed residential site being within a Central Area traffic growth rates for the years 2016 and 2030 of 1.62% per annum were applied with traffic growth of 1.51% per annum applied to the based traffic data for the years between 2030 and 2040 for the Dublin Metropolitan Area.

10.6 All of this future year traffic data formed the traffic turning movements within the various traffic modelling capacity assessments which identified the proposed residential could readily be accommodated within the adjacent road network with no material queuing projected within this junction, operating with reserve capacity of over 50% during the critical peak traffic period at the worst-case future year of 2039.

10.7 This traffic modelling identified the relative Level of Service within the proposed site access at its junction with Cherry Orchard Industrial Estate is identified as C within the above PICADY9 assessment representing "stable flow urban traffic conditions", as set out within the Highway Capacity Manual.

10.8 The methodology used within these assessments is standard within the field of traffic engineering and based on guidelines set out within Traffic and Transport Assessment Guidelines' published by the former National Roads Authority (May 2014).

> *The Roads Department raise concerns regarding the width of roads for refuse access, and lack of turning heads in some instances – autotrack for fire and refuse trucks and have been requested. It is also set out that adequate space surrounding parking areas is required, as well as visibility splays.*

10.9 The proposed internal access arrangements have been designed to accommodate the inbound and outbound movements of a fire tender and refuse cart with these vehicles undertaking a series of turning manoeuvres within the proposed development site.

10.10 The turning manoeuvres for both the fire tender and refuse is shown within Drawing Number 120-A31-SP01 which is included within the SHIPSEYBARRY Project Architects Design Brief.

> *In terms of accessibility, the site is close to Bus Stops and a QBC, Roads has requested that linkages/connectivity to these modes of transport are strengthened.*
>
> *The Planning Report also noted within Item 6 that the Roads Department Report, and having regard to the transitional nature of the proposed development and the density of dwellings and the site's reliance on pedestrian connectivity to facilities/amenities and public transport, the Planning Authority would ask that further consideration be given to the main junction into the REGEN lands, tightening up of the junction radii, the inclusion of raised tables, changes in materials (to indicate that vehicles are entering a pedestrian/cycle friendly zone), vertical/horizontal deflections and other DMURS methods to create quality environment and safe and useable streets should be introduced into the scheme.*

10.11 We agree with the Transportation Departments suggestion that the proposed residential development is close to existing and future public transport links.

10.12 Links between the proposed residential development and these existing and proposed public transport facilities could be enhanced by the provision of say a fully controlled pedestrian crossing to the north of the Kennelsfort Road North junction with Cherry Orchard Industrial Estate.

10.13 This pedestrian crossing would provide a formal location for the pedestrians, dismounted cyclists and vulnerable road users to cross within this junction in a safe and control manner.

10.14 A preliminary layout of this controlled crossing and enhanced cyclist facilities proposal has been submitted to the Transportation Department within South Dublin County Council and is shown in indicative form within the SHIPSEYBARRY Project Architects Design Brief.

10.15 If the Local Authority are in favour of this arrangement the detailed design could be agreed with the Local Authority should, An Bord Pleanala be minded to grant approval for this residential development. The detailed design of these off-site proposals can also be fully incorporated within a road safety audit procedure and if approved, this audit could be conditioned by An Bord Pleanala.

10.16 The matter of providing reduced junction radii within the Kennellsfort Road Upper and the Cherry Orchard Industrial Estate junction can only be considered within lands that are under the control of the Local Authority or the applicant.

10.17 We understand the land area which broadly contains the westbound carriageway within the Cherry Orchard Industrial Estate (fronting the application site) is not in the charge of the Local Authority nor is this land area in the control of the applicant.

10.18 As this land area is in the control of a third party, no design proposals that would involve a reduction within the geometry of this area of the junction can be undertaken by the applicant. Likewise, no proposals involving the provision of raised tables, surface treatment, vertical or horizontal deflection measures can be undertaken by the applicant within these lands.

10.19 Revisions can be proposed by the applicant which reduce the inbound junction radius from the southbound carriageway of Kennelsfort Road Upper into the eastbound carriageway of the Cherry Orchard Industrial Estate.

10.20 It should also be noted that Kennellsfort Road Upper and the Cherry Orchard Industrial Estate junction and the Cherry Orchard Industrial Estate Road will for the foreseeable future operate as an access to the Industrial Estate with continued daily turning movements of heavy vehicles through this corridor.

10.21 However, these off site controlled pedestrian proposals and junction proposals can be regarded as the catalyst to further traffic calming measures in this area, as overtime the industrial land uses in this area will be replaced by residential land use development.

*Insufficient car parking has been provided in line with the prescribed standards. If the proposal changed from Build to Rent to Build to Sell, the parking requirement would increase further. Bicycle Parking is sufficient.*

10.22 As previously discussed the extent of car parking provision within a proposed residential site is discussed within Table 11.24 of the South Dublin Development Plan 2016 to 2022. These parking standards are the maximum that should be provided and where the proposed development is close to public transport or has a robust mobility management plan in place or combined journeys can be undertaken a lower parking standard is acceptable.

10.23 The Design Standards for New Apartments published by the Department of Housing, Planning and Local Government in March 2018 also promotes a lower parking provision based on the site proximity to public transport corridors

10.24 The proposed residential site is in proximity to an existing and future improved public transport corridor and with the proposed to provide 65 parking spaces and 310 resident and visitor bicycle parking spaces within the development site which at surface level is some 52% in compliance with the development plan car parking standards.

10.25 Furthermore, the provision of dedicated car club parking spaces adjacent to the development site will provide a credible alternative to car ownership for residents and others in this area.

10.26 Considering all the above, the provision of 65 parking spaces which is 52% in compliance with the development plan standards is more than sufficient to serve the proposed residential apartment development.

## 11.0 Conclusions.

11.1 The Traffic Impact Assessment relates to a proposed 144-unit residential apartment development on lands off the Cherry Orchard Industrial Estate. In this report the existing roads and traffic situation on the surrounding road network have been identified.

11.2 The level of traffic impact the proposed development is likely to have on the adjacent road network has also been assessed and it has been identified how the traffic associated with the proposed development can be accommodated within the existing road network.

11.3 Capacity assessments have been carried out on the critical junction, the Kennelsfort Road Upper with Cherry Orchard Industrial Road which indicates that under the forecast future traffic conditions there will be sufficient practical reserve capacity at this junction to accommodate the traffic associated with the 144-unit residential development.

11.4 The proposed development seeks to redevelop a brownfield site within walking distance of a QBC and also supported by local bus services, and as such it is considered an appropriate form and density of development in the context of supporting the vision and objectives of the Transport Strategy for the Greater Dublin Area 2016-2035.

11.5 The proposed development site is located close to a series of Dublin Bus stops on Kennelsfort Road Upper, which provide good quality public transport links. These stops are within 2-to-3 minutes walk from the proposed 144 residential apartment development site. In addition, the proposed development site is within a 4-minute walk of the Clondalkin/ Ballyfermot Quality Bus Corridor (QBC).

11.6 Specific to this site and having regard to the census data for the area and for Dublin City, it is considered that providing 65 spaces for this Build to Sell apartment development is more than sufficient to serve this application site. Furthermore, this extent of parking provision promotes the use of alternative modes of travel to and from the site, thereby encouraging sustainable travel.

11.7 The proposed development is consistent with both the principles and guidance outlined within the Design Manual for Urban Roads and Streets (DMURS) 2013, as amended in 2019. The scheme proposals are the outcome of an integrated design approach. This approach seeks to implement a sustainable community connected by well-designed links, layout and access, which combined will deliver an attractive, convenient and safe development in addition to promoting modal shift and viable alternatives to car-based journeys.

11.8 Considering all the above, it is considered that the provision of 65 car parking spaces, 310 bicycle parking spaces, 8 motorcycle spaces and 2 car club parking spaces is more than adequate to serve this residential development.

Classified Traffic Surveys. Appendix 1.0

Ireland

9 City Gate,
Lower Bridge Street,
Dublin 8

Tel: 01 633 4725
Fax: 01 633 4562

# TPS
# KENNELSFORT ROAD UPPER
# TRAFFIC SURVEY

## SURVEY REPORT
## APRIL 2021

| | |
|---|---|
| PROJECT NO. | 11577 |
| CHECKED | P. MURRAY |
| DATE | 19/04/2021 |
| CONTACT | A.CHAMBERS |
| REVISION | |

Email: enquiries@nationwidedatacollection.ie
Website: www.nationwidedatacollection.ie

Registered Office:
9 City Gate, Lower Bridge Street,,
Dublin 8
Company Reg. No. 444096
VAT Reg. No. IE 9664307L

**CONTENTS**

## INTRODUCTION

Nationwide Data Collection (NDC) was instructed by TPS to undertake junction turning counts along Kennelsfort Road Upper, Co. Dublin.

A general location plan is given in Diagram 11577-01.

## JUNCTION TURNING COUNTS

Junction turning counts were undertaken at the following sites:

| Site No. | Location. | Day / Date |
|---|---|---|
| 1 | Kennelsfort Road Upper(N) / Coldcut Road / Kennelsfort Road Upper(S) | Tuesday 13th April 2021 |
| 2 | Kennelsfort Road Upper(N) / Kennelsfort Road Upper(S) / Cherry Orchard Industrial Estate | |
| 3 | Kennelsfort Road Upper(N) / Palmers Crescent / Kennelsfort Road Upper(S) | |

All sites were surveyed using telescopically mounted video cameras from which the information was subsequently extracted. Details of the observed movements are given in Diagram 11577-01.

The survey was carried out with survey hours of 07:00 to 09:30 and 16:00 to 18:30. All information was collected in 15 minute intervals and has been tabulated with both peak hour and period totals.

Vehicles were classified into the following categories:

- Cars and Taxis / Light Goods Vehicles (**LV**),
- Heavy Goods Vehicles / Buses (**HV**).

A detailed description of the vehicles included in each category is provided in Appendix A.

**SITE REPORT**

| | |
|---|---|
| **Weather** | Clear and sunny. |
| **Accidents** | None. |
| **Roadworks** | None. |
| **Queues** | Not required. |
| **Pedestrians** | Not required. |
| **General Site Notes.** | No additional site notes. |

# APPENDIX A

# VEHICLE CATEGORIES


| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NDC NATIONWIDE DATA COLLECTION | **Sites / Location:** | Sites 1 to 3 / Kennelsfort Road Upper | **Project No:** | 11577 | **Diagram No:** | 11577-01 | **Drawn By:** | AC |
| | **Survey Date:** | Tuesday 13th April 2021 | **Project Name:** | KENNELSFORT ROAD UPPER | | | | |
| | **Survey Times:** | 07:00 to 09:30 & 16:00 to 18:30 | **Diagram Title:** | General Location Plan | | | | |

## VEHICLE CATEGORIES

**LIGHT VEHICLES (LV)**


SALOON


ESTATE


PEOPLE CARRIER


CAR TOWING CARAVAN / TRAILER


VAN


<3.5 TONNES – single rear tyres


PICK-UP

**HEAVY VEHICLES (HV)**


> 3.5 TONNES – twin rear tyres


2-AXLES RIGID


2-AXLES RIGID

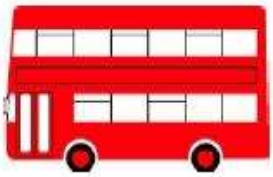

3 AXLES-RIGID

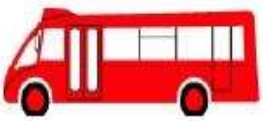

4 OR MORE AXLES RIGID


3-AXLES ARTIC


4 OR MORE AXLES ARTIC


OTHER GOODS VEHICLE WITH TRAILER


DOUBLE DECK BUS


SINGLE DECK BUS OR COACH

## VEHICLE CATEGORIES

### Definition of Categories

The various components of traffic have different characteristics in terms of operating costs, growth and occupancy. For the purpose of this survey vehicles types are defined as follows:

Cars and Light Goods Vehicles are grouped together as Light Vehicles (**LV**). All other Goods Vehicles, Buses and Coaches are defined as Heavy Vehicles (**HV**).

### Cars (CARS)

Including taxis, estate cars, 'people carriers' and other passenger vehicles (for example, minibuses and camper vans) with a gross vehicle weight of less than 3.5 tonnes, normally ones which can accommodate not more than 15 seats. Three-wheeled cars, motor invalid carriages, Land Rovers, Range Rovers and Jeeps and smaller ambulances are included. Cars towing caravans or trailers are counted as one vehicle unless included as a separate class.

### Light Goods Vehicles (LGV)

Includes all goods vehicles up to 3.5 tonnes gross vehicle weight (goods vehicles over 3.5 tonnes have sideguards fitted between axles), including those towing a trailer or caravan. This includes all car delivery vans and those of the next larger carrying capacity such as transit vans. Included here are small pickup vans, three-wheeled goods vehicles, milk floats and pedestrian controlled motor vehicles. Most of this group is delivery vans of one type or another.

### Other Goods Vehicles (OGV 1)

Includes all rigid vehicles over 3.5 tonnes gross vehicle weight with two or three axles Includes larger ambulances, tractors (without trailers), road rollers for tarmac pressing, box vans and similar large vans. A two or three axle motor tractive unit without a trailer is also included.

### Other Goods Vehicles (OGV 2)

This category includes all rigid vehicles with four or more axles and all articulated vehicles. Also included in this class are OGV1 goods vehicles towing a caravan or trailer.

### Buses and Coaches (PSV)

Includes all public service vehicles and works buses with a gross vehicle weight of 3.5 tonnes or more, usually vehicles with more than 16 seats.

Site No. 1
Location Kennelsfort Road Upper(N) / Coldcut Road / Kennelsfort Road Upper(S)
Date 13 April 2021

| Time | A to C - Kennelsfort Road Upper(N) to Kennelsfort Road Upper(S) | | Veh. Total | A to B - Kennelsfort Road Upper(N) to Coldcut Road | | Veh. Total |
|---|---|---|---|---|---|---|
| | LV | HV | | LV | HV | |
| 07:00 | 16 | 1 | 17 | 33 | 0 | 33 |
| 07:15 | 18 | 1 | 19 | 33 | 1 | 34 |
| 07:30 | 42 | 2 | 44 | 45 | 2 | 47 |
| 07:45 | 46 | 4 | 50 | 60 | 4 | 64 |
| 08:00 | 51 | 2 | 53 | 64 | 4 | 68 |
| 08:15 | 63 | 1 | 64 | 65 | 1 | 66 |
| 08:30 | 69 | 2 | 71 | 81 | 5 | 86 |
| 08:45 | 56 | 1 | 57 | 55 | 4 | 59 |
| 09:00 | 45 | 3 | 48 | 93 | 3 | 96 |
| 09:15 | 44 | 2 | 46 | 61 | 3 | 64 |
| Total | 450 | 19 | 469 | 590 | 27 | 617 |
| Peak Hour | 08:15 | to | 09:15 | | | |
| 08:15 | 63 | 1 | 64 | 65 | 1 | 66 |
| 08:30 | 69 | 2 | 71 | 81 | 5 | 86 |
| 08:45 | 56 | 1 | 57 | 55 | 4 | 59 |
| 09:00 | 45 | 3 | 48 | 93 | 3 | 96 |
| Total | 233 | 7 | 240 | 294 | 13 | 307 |

Date 13 April 2021

| Time | A to C - Kennelsfort Road Upper(N) to Kennelsfort Road Upper(S) | | Veh. Total | A to B - Kennelsfort Road Upper(N) to Coldcut Road | | Veh. Total |
|---|---|---|---|---|---|---|
| | LV | HV | | LV | HV | |
| 16:00 | 27 | 1 | 28 | 69 | 3 | 72 |
| 16:15 | 27 | 0 | 27 | 48 | 2 | 50 |
| 16:30 | 39 | 2 | 41 | 81 | 2 | 83 |
| 16:45 | 29 | 1 | 30 | 73 | 5 | 78 |
| 17:00 | 38 | 2 | 40 | 65 | 1 | 66 |
| 17:15 | 23 | 1 | 24 | 63 | 1 | 64 |
| 17:30 | 26 | 1 | 27 | 77 | 2 | 79 |
| 17:45 | 31 | 2 | 33 | 58 | 3 | 61 |
| 18:00 | 26 | 2 | 28 | 63 | 4 | 67 |
| 18:15 | 19 | 2 | 21 | 51 | 0 | 51 |
| Total | 285 | 14 | 299 | 648 | 23 | 671 |
| Peak Hour | 16:30 | to | 17:30 | | | |
| 16:30 | 39 | 2 | 41 | 81 | 2 | 83 |
| 16:45 | 29 | 1 | 30 | 73 | 5 | 78 |
| 17:00 | 38 | 2 | 40 | 65 | 1 | 66 |
| 17:15 | 23 | 1 | 24 | 63 | 1 | 64 |
| Total | 129 | 6 | 135 | 282 | 9 | 291 |

Site No. 1
Location Kennelsfort Road Upper(N) / Coldcut Road / Kennelsfort Road Upper(S)
Date 13 April 2021

| Time | B to A - Coldcut Road to Kennelsfort Road Upper(N) | | Veh. Total | B to C - Coldcut Road to Kennelsfort Road Upper(S) | | Veh. Total |
|---|---|---|---|---|---|---|
| | LV | HV | | LV | HV | |
| 07:00 | 28 | 1 | 29 | 68 | 3 | 71 |
| 07:15 | 36 | 3 | 39 | 67 | 4 | 71 |
| 07:30 | 46 | 4 | 50 | 114 | 2 | 116 |
| 07:45 | 64 | 1 | 65 | 109 | 6 | 115 |
| 08:00 | 68 | 2 | 70 | 110 | 7 | 117 |
| 08:15 | 98 | 8 | 106 | 129 | 5 | 134 |
| 08:30 | 94 | 6 | 100 | 99 | 5 | 104 |
| 08:45 | 60 | 2 | 62 | 99 | 2 | 101 |
| 09:00 | 74 | 5 | 79 | 155 | 7 | 162 |
| 09:15 | 65 | 3 | 68 | 91 | 6 | 97 |
| Total | 633 | 35 | 668 | 1041 | 47 | 1088 |
| Peak Hour | 08:15 | to | 09:15 | | | |
| 08:15 | 98 | 8 | 106 | 129 | 5 | 134 |
| 08:30 | 94 | 6 | 100 | 99 | 5 | 104 |
| 08:45 | 60 | 2 | 62 | 99 | 2 | 101 |
| 09:00 | 74 | 5 | 79 | 155 | 7 | 162 |
| Total | 326 | 21 | 347 | 482 | 19 | 501 |

Date 13 April 2021

| Time | B to A - Coldcut Road to Kennelsfort Road Upper(N) | | Veh. Total | B to C - Coldcut Road to Kennelsfort Road Upper(S) | | Veh. Total |
|---|---|---|---|---|---|---|
| | LV | HV | | LV | HV | |
| 16:00 | 87 | 1 | 88 | 86 | 3 | 89 |
| 16:15 | 83 | 3 | 86 | 87 | 5 | 92 |
| 16:30 | 71 | 2 | 73 | 87 | 3 | 90 |
| 16:45 | 82 | 0 | 82 | 86 | 4 | 90 |
| 17:00 | 55 | 3 | 58 | 85 | 2 | 87 |
| 17:15 | 70 | 2 | 72 | 85 | 5 | 90 |
| 17:30 | 63 | 1 | 64 | 82 | 5 | 87 |
| 17:45 | 64 | 0 | 64 | 78 | 4 | 82 |
| 18:00 | 62 | 1 | 63 | 76 | 1 | 77 |
| 18:15 | 61 | 2 | 63 | 93 | 3 | 96 |
| Total | 698 | 15 | 713 | 845 | 35 | 880 |
| Peak Hour | 16:30 | to | 17:30 | | | |
| 16:30 | 71 | 2 | 73 | 87 | 3 | 90 |
| 16:45 | 82 | 0 | 82 | 86 | 4 | 90 |
| 17:00 | 55 | 3 | 58 | 85 | 2 | 87 |
| 17:15 | 70 | 2 | 72 | 85 | 5 | 90 |
| Total | 278 | 7 | 285 | 343 | 14 | 357 |

Site No. 1
Location Kennelsfort Road Upper(N) / Coldcut Road / Kennelsfort Road Upper(S)
Date 13 April 2021

| Time | C to B - Kennelsfort Road Upper(S) to Coldcut Road | | Veh. Total | C to A - Kennelsfort Road Upper(S) to Kennelsfort Road Upper(N) | | Veh. Total |
|---|---|---|---|---|---|---|
| | LV | HV | | LV | HV | |
| 07:00 | 33 | 5 | 38 | 13 | 1 | 14 |
| 07:15 | 35 | 3 | 38 | 11 | 1 | 12 |
| 07:30 | 46 | 2 | 48 | 15 | 2 | 17 |
| 07:45 | 51 | 6 | 57 | 33 | 2 | 35 |
| 08:00 | 68 | 3 | 71 | 24 | 0 | 24 |
| 08:15 | 60 | 4 | 64 | 39 | 2 | 41 |
| 08:30 | 67 | 2 | 69 | 28 | 1 | 29 |
| 08:45 | 83 | 6 | 89 | 29 | 1 | 30 |
| 09:00 | 94 | 3 | 97 | 34 | 1 | 35 |
| 09:15 | 75 | 8 | 83 | 28 | 5 | 33 |
| Total | 612 | 42 | 654 | 254 | 16 | 270 |
| Peak Hour | 08:15 | to | 09:15 | | | |
| 08:15 | 60 | 4 | 64 | 39 | 2 | 41 |
| 08:30 | 67 | 2 | 69 | 28 | 1 | 29 |
| 08:45 | 83 | 6 | 89 | 29 | 1 | 30 |
| 09:00 | 94 | 3 | 97 | 34 | 1 | 35 |
| Total | 304 | 15 | 319 | 130 | 5 | 135 |

Date 13 April 2021

| Time | C to B - Kennelsfort Road Upper(S) to Coldcut Road | | Veh. Total | C to A - Kennelsfort Road Upper(S) to Kennelsfort Road Upper(N) | | Veh. Total |
|---|---|---|---|---|---|---|
| | LV | HV | | LV | HV | |
| 16:00 | 109 | 1 | 110 | 55 | 2 | 57 |
| 16:15 | 109 | 6 | 115 | 51 | 0 | 51 |
| 16:30 | 110 | 3 | 113 | 51 | 2 | 53 |
| 16:45 | 126 | 5 | 131 | 55 | 1 | 56 |
| 17:00 | 141 | 3 | 144 | 73 | 2 | 75 |
| 17:15 | 108 | 2 | 110 | 63 | 1 | 64 |
| 17:30 | 99 | 3 | 102 | 41 | 1 | 42 |
| 17:45 | 101 | 2 | 103 | 57 | 1 | 58 |
| 18:00 | 106 | 4 | 110 | 34 | 1 | 35 |
| 18:15 | 65 | 3 | 68 | 39 | 2 | 41 |
| Total | 1074 | 32 | 1106 | 519 | 13 | 532 |
| Peak Hour | 16:30 | to | 17:30 | | | |
| 16:30 | 110 | 3 | 113 | 51 | 2 | 53 |
| 16:45 | 126 | 5 | 131 | 55 | 1 | 56 |
| 17:00 | 141 | 3 | 144 | 73 | 2 | 75 |
| 17:15 | 108 | 2 | 110 | 63 | 1 | 64 |
| Total | 485 | 13 | 498 | 242 | 6 | 248 |

Site No. 1
Location Kennelsfort Road Upper(N) / Coldcut Road / Kennelsfort Road Upper(S)
Date 13 April 2021

| Time | To Arm A - Kennelsfort Road Upper(N) | | Veh. Total | From Arm A - Kennelsfort Road Upper(N) | | Veh. Total |
|---|---|---|---|---|---|---|
| | LV | HV | | LV | HV | |
| 07:00 | 41 | 2 | 43 | 49 | 1 | 50 |
| 07:15 | 47 | 4 | 51 | 51 | 2 | 53 |
| 07:30 | 61 | 6 | 67 | 87 | 4 | 91 |
| 07:45 | 97 | 3 | 100 | 106 | 8 | 114 |
| 08:00 | 92 | 2 | 94 | 115 | 6 | 121 |
| 08:15 | 137 | 10 | 147 | 128 | 2 | 130 |
| 08:30 | 122 | 7 | 129 | 150 | 7 | 157 |
| 08:45 | 89 | 3 | 92 | 111 | 5 | 116 |
| 09:00 | 108 | 6 | 114 | 138 | 6 | 144 |
| 09:15 | 93 | 8 | 101 | 105 | 5 | 110 |
| Total | 887 | 51 | 938 | 1040 | 46 | 1086 |
| Peak Hour | 08:15 | to | 09:15 | | | |
| 08:15 | 137 | 10 | 147 | 128 | 2 | 130 |
| 08:30 | 122 | 7 | 129 | 150 | 7 | 157 |
| 08:45 | 89 | 3 | 92 | 111 | 5 | 116 |
| 09:00 | 108 | 6 | 114 | 138 | 6 | 144 |
| Total | 456 | 26 | 482 | 527 | 20 | 547 |

Date 13 April 2021

| Time | To Arm A - Kennelsfort Road Upper(N) | | Veh. Total | From Arm A - Kennelsfort Road Upper(N) | | Veh. Total |
|---|---|---|---|---|---|---|
| | LV | HV | | LV | HV | |
| 16:00 | 142 | 3 | 145 | 96 | 4 | 100 |
| 16:15 | 134 | 3 | 137 | 75 | 2 | 77 |
| 16:30 | 122 | 4 | 126 | 120 | 4 | 124 |
| 16:45 | 137 | 1 | 138 | 102 | 6 | 108 |
| 17:00 | 128 | 5 | 133 | 103 | 3 | 106 |
| 17:15 | 133 | 3 | 136 | 86 | 2 | 88 |
| 17:30 | 104 | 2 | 106 | 103 | 3 | 106 |
| 17:45 | 121 | 1 | 122 | 89 | 5 | 94 |
| 18:00 | 96 | 2 | 98 | 89 | 6 | 95 |
| 18:15 | 100 | 4 | 104 | 70 | 2 | 72 |
| Total | 1217 | 28 | 1245 | 933 | 37 | 970 |
| Peak Hour | 16:30 | to | 17:30 | | | |
| 16:30 | 122 | 4 | 126 | 120 | 4 | 124 |
| 16:45 | 137 | 1 | 138 | 102 | 6 | 108 |
| 17:00 | 128 | 5 | 133 | 103 | 3 | 106 |
| 17:15 | 133 | 3 | 136 | 86 | 2 | 88 |
| Total | 520 | 13 | 533 | 411 | 15 | 426 |

Site No. 1
Location Kennelsfort Road Upper(N) / Coldcut Road / Kennelsfort Road Upper(S)
Date 13 April 2021

| Time | To Arm B - Coldcut Road | | Veh. Total | From Arm B - Coldcut Road | | Veh. Total |
|---|---|---|---|---|---|---|
| | LV | HV | | LV | HV | |
| 07:00 | 66 | 5 | 71 | 96 | 4 | 100 |
| 07:15 | 68 | 4 | 72 | 103 | 7 | 110 |
| 07:30 | 91 | 4 | 95 | 160 | 6 | 166 |
| 07:45 | 111 | 10 | 121 | 173 | 7 | 180 |
| 08:00 | 132 | 7 | 139 | 178 | 9 | 187 |
| 08:15 | 125 | 5 | 130 | 227 | 13 | 240 |
| 08:30 | 148 | 7 | 155 | 193 | 11 | 204 |
| 08:45 | 138 | 10 | 148 | 159 | 4 | 163 |
| 09:00 | 187 | 6 | 193 | 229 | 12 | 241 |
| 09:15 | 136 | 11 | 147 | 156 | 9 | 165 |
| Total | 1202 | 69 | 1271 | 1674 | 82 | 1756 |
| Peak Hour | 08:15 | to | 09:15 | | | |
| 08:15 | 125 | 5 | 130 | 227 | 13 | 240 |
| 08:30 | 148 | 7 | 155 | 193 | 11 | 204 |
| 08:45 | 138 | 10 | 148 | 159 | 4 | 163 |
| 09:00 | 187 | 6 | 193 | 229 | 12 | 241 |
| Total | 598 | 28 | 626 | 808 | 40 | 848 |

Date 13 April 2021

| Time | To Arm B - Coldcut Road | | Veh. Total | From Arm B - Coldcut Road | | Veh. Total |
|---|---|---|---|---|---|---|
| | LV | HV | | LV | HV | |
| 16:00 | 178 | 4 | 182 | 173 | 4 | 177 |
| 16:15 | 157 | 8 | 165 | 170 | 8 | 178 |
| 16:30 | 191 | 5 | 196 | 158 | 5 | 163 |
| 16:45 | 199 | 10 | 209 | 168 | 4 | 172 |
| 17:00 | 206 | 4 | 210 | 140 | 5 | 145 |
| 17:15 | 171 | 3 | 174 | 155 | 7 | 162 |
| 17:30 | 176 | 5 | 181 | 145 | 6 | 151 |
| 17:45 | 159 | 5 | 164 | 142 | 4 | 146 |
| 18:00 | 169 | 8 | 177 | 138 | 2 | 140 |
| 18:15 | 116 | 3 | 119 | 154 | 5 | 159 |
| Total | 1722 | 55 | 1777 | 1543 | 50 | 1593 |
| Peak Hour | 16:30 | to | 17:30 | | | |
| 16:30 | 191 | 5 | 196 | 158 | 5 | 163 |
| 16:45 | 199 | 10 | 209 | 168 | 4 | 172 |
| 17:00 | 206 | 4 | 210 | 140 | 5 | 145 |
| 17:15 | 171 | 3 | 174 | 155 | 7 | 162 |
| Total | 767 | 22 | 789 | 621 | 21 | 642 |

Site No. 1
Location Kennelsfort Road Upper(N) / Coldcut Road / Kennelsfort Road Upper(S)
Date 13 April 2021

| Time | To Arm C - Kennelsfort Road Upper(S) | | Veh. Total | From Arm C - Kennelsfort Road Upper(S) | | Veh. Total |
|---|---|---|---|---|---|---|
| | LV | HV | | LV | HV | |
| 07:00 | 84 | 4 | 88 | 46 | 6 | 52 |
| 07:15 | 85 | 5 | 90 | 46 | 4 | 50 |
| 07:30 | 156 | 4 | 160 | 61 | 4 | 65 |
| 07:45 | 155 | 10 | 165 | 84 | 8 | 92 |
| 08:00 | 161 | 9 | 170 | 92 | 3 | 95 |
| 08:15 | 192 | 6 | 198 | 99 | 6 | 105 |
| 08:30 | 168 | 7 | 175 | 95 | 3 | 98 |
| 08:45 | 155 | 3 | 158 | 112 | 7 | 119 |
| 09:00 | 200 | 10 | 210 | 128 | 4 | 132 |
| 09:15 | 135 | 8 | 143 | 103 | 13 | 116 |
| Total | 1491 | 66 | 1557 | 866 | 58 | 924 |
| Peak Hour | 08:15 | to | 09:15 | | | |
| 08:15 | 192 | 6 | 198 | 99 | 6 | 105 |
| 08:30 | 168 | 7 | 175 | 95 | 3 | 98 |
| 08:45 | 155 | 3 | 158 | 112 | 7 | 119 |
| 09:00 | 200 | 10 | 210 | 128 | 4 | 132 |
| Total | 715 | 26 | 741 | 434 | 20 | 454 |

Date 13 April 2021

| Time | To Arm C - Kennelsfort Road Upper(S) | | Veh. Total | From Arm C - Kennelsfort Road Upper(S) | | Veh. Total |
|---|---|---|---|---|---|---|
| | LV | HV | | LV | HV | |
| 16:00 | 113 | 4 | 117 | 164 | 3 | 167 |
| 16:15 | 114 | 5 | 119 | 160 | 6 | 166 |
| 16:30 | 126 | 5 | 131 | 161 | 5 | 166 |
| 16:45 | 115 | 5 | 120 | 181 | 6 | 187 |
| 17:00 | 123 | 4 | 127 | 214 | 5 | 219 |
| 17:15 | 108 | 6 | 114 | 171 | 3 | 174 |
| 17:30 | 108 | 6 | 114 | 140 | 4 | 144 |
| 17:45 | 109 | 6 | 115 | 158 | 3 | 161 |
| 18:00 | 102 | 3 | 105 | 140 | 5 | 145 |
| 18:15 | 112 | 5 | 117 | 104 | 5 | 109 |
| Total | 1130 | 49 | 1179 | 1593 | 45 | 1638 |
| Peak Hour | 16:30 | to | 17:30 | | | |
| 16:30 | 126 | 5 | 131 | 161 | 5 | 166 |
| 16:45 | 115 | 5 | 120 | 181 | 6 | 187 |
| 17:00 | 123 | 4 | 127 | 214 | 5 | 219 |
| 17:15 | 108 | 6 | 114 | 171 | 3 | 174 |
| Total | 472 | 20 | 492 | 727 | 19 | 746 |

Site No. 2
Location Kennelsfort Road Upper(N) / Kennelsfort Road Upper(S) / Cherry Orchard Industrial Estate
Date 13 April 2021

| Time | A to C - Kennelsfort Road Upper(N) to Cherry Orchard Industrial Estate | | Veh. Total | A to B - Kennelsfort Road Upper(N) to Kennelsfort Road Upper(S) | | Veh. Total |
|---|---|---|---|---|---|---|
| | LV | HV | | LV | HV | |
| 07:00 | 6 | 1 | 7 | 45 | 1 | 46 |
| 07:15 | 23 | 0 | 23 | 50 | 3 | 53 |
| 07:30 | 18 | 2 | 20 | 84 | 6 | 90 |
| 07:45 | 16 | 1 | 17 | 102 | 5 | 107 |
| 08:00 | 25 | 1 | 26 | 107 | 4 | 111 |
| 08:15 | 42 | 2 | 44 | 111 | 1 | 112 |
| 08:30 | 46 | 3 | 49 | 133 | 6 | 139 |
| 08:45 | 49 | 2 | 51 | 105 | 3 | 108 |
| 09:00 | 66 | 2 | 68 | 136 | 4 | 140 |
| 09:15 | 27 | 3 | 30 | 97 | 4 | 101 |
| Total | 318 | 17 | 335 | 970 | 37 | 1007 |
| Peak Hour | 08:15 | to | 09:15 | | | |
| 08:15 | 42 | 2 | 44 | 111 | 1 | 112 |
| 08:30 | 46 | 3 | 49 | 133 | 6 | 139 |
| 08:45 | 49 | 2 | 51 | 105 | 3 | 108 |
| 09:00 | 66 | 2 | 68 | 136 | 4 | 140 |
| Total | 203 | 9 | 212 | 485 | 14 | 499 |

Date 13 April 2021

| Time | A to C - Kennelsfort Road Upper(N) to Cherry Orchard Industrial Estate | | Veh. Total | A to B - Kennelsfort Road Upper(N) to Kennelsfort Road Upper(S) | | Veh. Total |
|---|---|---|---|---|---|---|
| | LV | HV | | LV | HV | |
| 16:00 | 26 | 0 | 26 | 82 | 3 | 85 |
| 16:15 | 31 | 0 | 31 | 81 | 2 | 83 |
| 16:30 | 22 | 1 | 23 | 93 | 2 | 95 |
| 16:45 | 24 | 0 | 24 | 88 | 6 | 94 |
| 17:00 | 20 | 0 | 20 | 91 | 2 | 93 |
| 17:15 | 18 | 1 | 19 | 76 | 2 | 78 |
| 17:30 | 16 | 0 | 16 | 87 | 2 | 89 |
| 17:45 | 21 | 0 | 21 | 82 | 7 | 89 |
| 18:00 | 9 | 0 | 9 | 87 | 4 | 91 |
| 18:15 | 12 | 0 | 12 | 73 | 2 | 75 |
| Total | 199 | 2 | 201 | 840 | 32 | 872 |
| Peak Hour | 16:00 | to | 17:00 | | | |
| 16:00 | 26 | 0 | 26 | 82 | 3 | 85 |
| 16:15 | 31 | 0 | 31 | 81 | 2 | 83 |
| 16:30 | 22 | 1 | 23 | 93 | 2 | 95 |
| 16:45 | 24 | 0 | 24 | 88 | 6 | 94 |
| Total | 103 | 1 | 104 | 344 | 13 | 357 |

Site No. 2
Location Kennelsfort Road Upper(N) / Kennelsfort Road Upper(S) / Cherry Orchard Industrial Estate
Date 13 April 2021

| Time | B to A - Kennelsfort Road Upper(S) to Kennelsfort Road Upper(N) | | Veh. Total | B to C - Kennelsfort Road Upper(S) to Cherry Orchard Industrial Estate | | Veh. Total |
|---|---|---|---|---|---|---|
| | LV | HV | | LV | HV | |
| 07:00 | 39 | 2 | 41 | 2 | 1 | 3 |
| 07:15 | 47 | 3 | 50 | 10 | 1 | 11 |
| 07:30 | 62 | 4 | 66 | 8 | 1 | 9 |
| 07:45 | 89 | 3 | 92 | 18 | 0 | 18 |
| 08:00 | 82 | 3 | 85 | 13 | 0 | 13 |
| 08:15 | 120 | 5 | 125 | 6 | 4 | 10 |
| 08:30 | 87 | 3 | 90 | 15 | 1 | 16 |
| 08:45 | 59 | 4 | 63 | 9 | 2 | 11 |
| 09:00 | 108 | 2 | 110 | 10 | 5 | 15 |
| 09:15 | 84 | 7 | 91 | 8 | 0 | 8 |
| Total | 777 | 36 | 813 | 99 | 15 | 114 |
| Peak Hour | 08:15 | to | 09:15 | | | |
| 08:15 | 120 | 5 | 125 | 6 | 4 | 10 |
| 08:30 | 87 | 3 | 90 | 15 | 1 | 16 |
| 08:45 | 59 | 4 | 63 | 9 | 2 | 11 |
| 09:00 | 108 | 2 | 110 | 10 | 5 | 15 |
| Total | 374 | 14 | 388 | 40 | 12 | 52 |

Date 13 April 2021

| Time | B to A - Kennelsfort Road Upper(S) to Kennelsfort Road Upper(N) | | Veh. Total | B to C - Kennelsfort Road Upper(S) to Cherry Orchard Industrial Estate | | Veh. Total |
|---|---|---|---|---|---|---|
| | LV | HV | | LV | HV | |
| 16:00 | 130 | 3 | 133 | 6 | 0 | 6 |
| 16:15 | 131 | 3 | 134 | 6 | 1 | 7 |
| 16:30 | 116 | 4 | 120 | 5 | 0 | 5 |
| 16:45 | 131 | 1 | 132 | 3 | 0 | 3 |
| 17:00 | 121 | 4 | 125 | 1 | 1 | 2 |
| 17:15 | 126 | 2 | 128 | 6 | 1 | 7 |
| 17:30 | 102 | 1 | 103 | 3 | 0 | 3 |
| 17:45 | 114 | 2 | 116 | 2 | 0 | 2 |
| 18:00 | 97 | 2 | 99 | 1 | 0 | 1 |
| 18:15 | 103 | 4 | 107 | 2 | 0 | 2 |
| Total | 1171 | 26 | 1197 | 35 | 3 | 38 |
| Peak Hour | 16:00 | to | 17:00 | | | |
| 16:00 | 130 | 3 | 133 | 6 | 0 | 6 |
| 16:15 | 131 | 3 | 134 | 6 | 1 | 7 |
| 16:30 | 116 | 4 | 120 | 5 | 0 | 5 |
| 16:45 | 131 | 1 | 132 | 3 | 0 | 3 |
| Total | 508 | 11 | 519 | 20 | 1 | 21 |

Site No. 2
Location Kennelsfort Road Upper(N) / Kennelsfort Road Upper(S) / Cherry Orchard Industrial Estate
Date 13 April 2021

| Time | C to B - Cherry Orchard Industrial Estate to Kennelsfort Road Upper(S) | | Veh. Total | C to A - Cherry Orchard Industrial Estate to Kennelsfort Road Upper(N) | | Veh. Total |
|---|---|---|---|---|---|---|
| | LV | HV | | LV | HV | |
| 07:00 | 1 | 0 | 1 | 6 | 1 | 7 |
| 07:15 | 1 | 0 | 1 | 8 | 0 | 8 |
| 07:30 | 1 | 0 | 1 | 6 | 4 | 10 |
| 07:45 | 1 | 2 | 3 | 13 | 2 | 15 |
| 08:00 | 5 | 2 | 7 | 10 | 1 | 11 |
| 08:15 | 11 | 0 | 11 | 10 | 2 | 12 |
| 08:30 | 16 | 1 | 17 | 26 | 0 | 26 |
| 08:45 | 13 | 1 | 14 | 24 | 1 | 25 |
| 09:00 | 8 | 2 | 10 | 20 | 0 | 20 |
| 09:15 | 3 | 2 | 5 | 22 | 1 | 23 |
| Total | 60 | 10 | 70 | 145 | 12 | 157 |
| Peak Hour | 08:15 | to | 09:15 | | | |
| 08:15 | 11 | 0 | 11 | 10 | 2 | 12 |
| 08:30 | 16 | 1 | 17 | 26 | 0 | 26 |
| 08:45 | 13 | 1 | 14 | 24 | 1 | 25 |
| 09:00 | 8 | 2 | 10 | 20 | 0 | 20 |
| Total | 48 | 4 | 52 | 80 | 3 | 83 |

Date 13 April 2021

| Time | C to B - Cherry Orchard Industrial Estate to Kennelsfort Road Upper(S) | | Veh. Total | C to A - Cherry Orchard Industrial Estate to Kennelsfort Road Upper(N) | | Veh. Total |
|---|---|---|---|---|---|---|
| | LV | HV | | LV | HV | |
| 16:00 | 13 | 1 | 14 | 32 | 0 | 32 |
| 16:15 | 13 | 1 | 14 | 30 | 1 | 31 |
| 16:30 | 19 | 2 | 21 | 48 | 0 | 48 |
| 16:45 | 14 | 0 | 14 | 34 | 1 | 35 |
| 17:00 | 7 | 0 | 7 | 44 | 1 | 45 |
| 17:15 | 8 | 0 | 8 | 21 | 1 | 22 |
| 17:30 | 9 | 1 | 10 | 40 | 0 | 40 |
| 17:45 | 6 | 0 | 6 | 14 | 0 | 14 |
| 18:00 | 7 | 0 | 7 | 26 | 0 | 26 |
| 18:15 | 6 | 0 | 6 | 16 | 0 | 16 |
| Total | 102 | 5 | 107 | 305 | 4 | 309 |
| Peak Hour | 16:00 | to | 17:00 | | | |
| 16:00 | 13 | 1 | 14 | 32 | 0 | 32 |
| 16:15 | 13 | 1 | 14 | 30 | 1 | 31 |
| 16:30 | 19 | 2 | 21 | 48 | 0 | 48 |
| 16:45 | 14 | 0 | 14 | 34 | 1 | 35 |
| Total | 59 | 4 | 63 | 144 | 2 | 146 |

Site No. 2
Location Kennelsfort Road Upper(N) / Kennelsfort Road Upper(S) / Cherry Orchard Industrial Estate
Date 13 April 2021

| Time | To Arm A - Kennelsfort Road Upper(N) | | Veh. Total | From Arm A - Kennelsfort Road Upper(N) | | Veh. Total |
|---|---|---|---|---|---|---|
| | LV | HV | | LV | HV | |
| 07:00 | 45 | 3 | 48 | 51 | 2 | 53 |
| 07:15 | 55 | 3 | 58 | 73 | 3 | 76 |
| 07:30 | 68 | 8 | 76 | 102 | 8 | 110 |
| 07:45 | 102 | 5 | 107 | 118 | 6 | 124 |
| 08:00 | 92 | 4 | 96 | 132 | 5 | 137 |
| 08:15 | 130 | 7 | 137 | 153 | 3 | 156 |
| 08:30 | 113 | 3 | 116 | 179 | 9 | 188 |
| 08:45 | 83 | 5 | 88 | 154 | 5 | 159 |
| 09:00 | 128 | 2 | 130 | 202 | 6 | 208 |
| 09:15 | 106 | 8 | 114 | 124 | 7 | 131 |
| Total | 922 | 48 | 970 | 1288 | 54 | 1342 |
| Peak Hour | 08:15 | to | 09:15 | | | |
| 08:15 | 130 | 7 | 137 | 153 | 3 | 156 |
| 08:30 | 113 | 3 | 116 | 179 | 9 | 188 |
| 08:45 | 83 | 5 | 88 | 154 | 5 | 159 |
| 09:00 | 128 | 2 | 130 | 202 | 6 | 208 |
| Total | 454 | 17 | 471 | 688 | 23 | 711 |

Date 13 April 2021

| Time | To Arm A - Kennelsfort Road Upper(N) | | Veh. Total | From Arm A - Kennelsfort Road Upper(N) | | Veh. Total |
|---|---|---|---|---|---|---|
| | LV | HV | | LV | HV | |
| 16:00 | 162 | 3 | 165 | 108 | 3 | 111 |
| 16:15 | 161 | 4 | 165 | 112 | 2 | 114 |
| 16:30 | 164 | 4 | 168 | 115 | 3 | 118 |
| 16:45 | 165 | 2 | 167 | 112 | 6 | 118 |
| 17:00 | 165 | 5 | 170 | 111 | 2 | 113 |
| 17:15 | 147 | 3 | 150 | 94 | 3 | 97 |
| 17:30 | 142 | 1 | 143 | 103 | 2 | 105 |
| 17:45 | 128 | 2 | 130 | 103 | 7 | 110 |
| 18:00 | 123 | 2 | 125 | 96 | 4 | 100 |
| 18:15 | 119 | 4 | 123 | 85 | 2 | 87 |
| Total | 1476 | 30 | 1506 | 1039 | 34 | 1073 |
| Peak Hour | 16:00 | to | 17:00 | | | |
| 16:00 | 162 | 3 | 165 | 108 | 3 | 111 |
| 16:15 | 161 | 4 | 165 | 112 | 2 | 114 |
| 16:30 | 164 | 4 | 168 | 115 | 3 | 118 |
| 16:45 | 165 | 2 | 167 | 112 | 6 | 118 |
| Total | 652 | 13 | 665 | 447 | 14 | 461 |

Site No. 2
Location Kennelsfort Road Upper(N) / Kennelsfort Road Upper(S) / Cherry Orchard Industrial Estate
Date 13 April 2021

| Time | To Arm B - Kennelsfort Road Upper(S) | | Veh. Total | From Arm B - Kennelsfort Road Upper(S) | | Veh. Total |
|---|---|---|---|---|---|---|
| | LV | HV | | LV | HV | |
| 07:00 | 46 | 1 | 47 | 41 | 3 | 44 |
| 07:15 | 51 | 3 | 54 | 57 | 4 | 61 |
| 07:30 | 85 | 6 | 91 | 70 | 5 | 75 |
| 07:45 | 103 | 7 | 110 | 107 | 3 | 110 |
| 08:00 | 112 | 6 | 118 | 95 | 3 | 98 |
| 08:15 | 122 | 1 | 123 | 126 | 9 | 135 |
| 08:30 | 149 | 7 | 156 | 102 | 4 | 106 |
| 08:45 | 118 | 4 | 122 | 68 | 6 | 74 |
| 09:00 | 144 | 6 | 150 | 118 | 7 | 125 |
| 09:15 | 100 | 6 | 106 | 92 | 7 | 99 |
| Total | 1030 | 47 | 1077 | 876 | 51 | 927 |
| Peak Hour | 08:15 | to | 09:15 | | | |
| 08:15 | 122 | 1 | 123 | 126 | 9 | 135 |
| 08:30 | 149 | 7 | 156 | 102 | 4 | 106 |
| 08:45 | 118 | 4 | 122 | 68 | 6 | 74 |
| 09:00 | 144 | 6 | 150 | 118 | 7 | 125 |
| Total | 533 | 18 | 551 | 414 | 26 | 440 |

Date 13 April 2021

| Time | To Arm B - Kennelsfort Road Upper(S) | | Veh. Total | From Arm B - Kennelsfort Road Upper(S) | | Veh. Total |
|---|---|---|---|---|---|---|
| | LV | HV | | LV | HV | |
| 16:00 | 95 | 4 | 99 | 136 | 3 | 139 |
| 16:15 | 94 | 3 | 97 | 137 | 4 | 141 |
| 16:30 | 112 | 4 | 116 | 121 | 4 | 125 |
| 16:45 | 102 | 6 | 108 | 134 | 1 | 135 |
| 17:00 | 98 | 2 | 100 | 122 | 5 | 127 |
| 17:15 | 84 | 2 | 86 | 132 | 3 | 135 |
| 17:30 | 96 | 3 | 99 | 105 | 1 | 106 |
| 17:45 | 88 | 7 | 95 | 116 | 2 | 118 |
| 18:00 | 94 | 4 | 98 | 98 | 2 | 100 |
| 18:15 | 79 | 2 | 81 | 105 | 4 | 109 |
| Total | 942 | 37 | 979 | 1206 | 29 | 1235 |
| Peak Hour | 16:00 | to | 17:00 | | | |
| 16:00 | 95 | 4 | 99 | 136 | 3 | 139 |
| 16:15 | 94 | 3 | 97 | 137 | 4 | 141 |
| 16:30 | 112 | 4 | 116 | 121 | 4 | 125 |
| 16:45 | 102 | 6 | 108 | 134 | 1 | 135 |
| Total | 403 | 17 | 420 | 528 | 12 | 540 |

Site No. 2
Location Kennelsfort Road Upper(N) / Kennelsfort Road Upper(S) / Cherry Orchard Industrial Estate
Date 13 April 2021

| Time | To Arm C - Cherry Orchard Industrial Estate | | Veh. Total | From Arm C - Cherry Orchard Industrial Estate | | Veh. Total |
|---|---|---|---|---|---|---|
| | LV | HV | | LV | HV | |
| 07:00 | 8 | 2 | 10 | 7 | 1 | 8 |
| 07:15 | 33 | 1 | 34 | 9 | 0 | 9 |
| 07:30 | 26 | 3 | 29 | 7 | 4 | 11 |
| 07:45 | 34 | 1 | 35 | 14 | 4 | 18 |
| 08:00 | 38 | 1 | 39 | 15 | 3 | 18 |
| 08:15 | 48 | 6 | 54 | 21 | 2 | 23 |
| 08:30 | 61 | 4 | 65 | 42 | 1 | 43 |
| 08:45 | 58 | 4 | 62 | 37 | 2 | 39 |
| 09:00 | 76 | 7 | 83 | 28 | 2 | 30 |
| 09:15 | 35 | 3 | 38 | 25 | 3 | 28 |
| Total | 417 | 32 | 449 | 205 | 22 | 227 |
| Peak Hour | 08:15 | to | 09:15 | | | |
| 08:15 | 48 | 6 | 54 | 21 | 2 | 23 |
| 08:30 | 61 | 4 | 65 | 42 | 1 | 43 |
| 08:45 | 58 | 4 | 62 | 37 | 2 | 39 |
| 09:00 | 76 | 7 | 83 | 28 | 2 | 30 |
| Total | 243 | 21 | 264 | 128 | 7 | 135 |

Date 13 April 2021

| Time | To Arm C - Cherry Orchard Industrial Estate | | Veh. Total | From Arm C - Cherry Orchard Industrial Estate | | Veh. Total |
|---|---|---|---|---|---|---|
| | LV | HV | | LV | HV | |
| 16:00 | 32 | 0 | 32 | 45 | 1 | 46 |
| 16:15 | 37 | 1 | 38 | 43 | 2 | 45 |
| 16:30 | 27 | 1 | 28 | 67 | 2 | 69 |
| 16:45 | 27 | 0 | 27 | 48 | 1 | 49 |
| 17:00 | 21 | 1 | 22 | 51 | 1 | 52 |
| 17:15 | 24 | 2 | 26 | 29 | 1 | 30 |
| 17:30 | 19 | 0 | 19 | 49 | 1 | 50 |
| 17:45 | 23 | 0 | 23 | 20 | 0 | 20 |
| 18:00 | 10 | 0 | 10 | 33 | 0 | 33 |
| 18:15 | 14 | 0 | 14 | 22 | 0 | 22 |
| Total | 234 | 5 | 239 | 407 | 9 | 416 |
| Peak Hour | 16:00 | to | 17:00 | | | |
| 16:00 | 32 | 0 | 32 | 45 | 1 | 46 |
| 16:15 | 37 | 1 | 38 | 43 | 2 | 45 |
| 16:30 | 27 | 1 | 28 | 67 | 2 | 69 |
| 16:45 | 27 | 0 | 27 | 48 | 1 | 49 |
| Total | 123 | 2 | 125 | 203 | 6 | 209 |

Site No. 3
Location Kennelsfort Road Upper(N) / Palmers Crescent / Kennelsfort Road Upper(S)
Date 13 April 2021

| Time | A to C - Kennelsfort Road Upper(N) to Kennelsfort Road Upper(S) | | Veh. Total | A to B - Kennelsfort Road Upper(N) to Palmers Crescent | | Veh. Total |
|---|---|---|---|---|---|---|
| | LV | HV | | LV | HV | |
| 07:00 | 45 | 2 | 47 | 0 | 0 | 0 |
| 07:15 | 79 | 3 | 82 | 3 | 0 | 3 |
| 07:30 | 98 | 8 | 106 | 0 | 1 | 1 |
| 07:45 | 118 | 6 | 124 | 2 | 0 | 2 |
| 08:00 | 125 | 5 | 130 | 0 | 0 | 0 |
| 08:15 | 159 | 3 | 162 | 2 | 0 | 2 |
| 08:30 | 170 | 9 | 179 | 5 | 0 | 5 |
| 08:45 | 160 | 5 | 165 | 6 | 0 | 6 |
| 09:00 | 191 | 6 | 197 | 10 | 0 | 10 |
| 09:15 | 128 | 7 | 135 | 0 | 0 | 0 |
| Total | 1273 | 54 | 1327 | 28 | 1 | 29 |
| Peak Hour | 08:15 | to | 09:15 | | | |
| 08:15 | 159 | 3 | 162 | 2 | 0 | 2 |
| 08:30 | 170 | 9 | 179 | 5 | 0 | 5 |
| 08:45 | 160 | 5 | 165 | 6 | 0 | 6 |
| 09:00 | 191 | 6 | 197 | 10 | 0 | 10 |
| Total | 680 | 23 | 703 | 23 | 0 | 23 |

Date 13 April 2021

| Time | A to C - Kennelsfort Road Upper(N) to Kennelsfort Road Upper(S) | | Veh. Total | A to B - Kennelsfort Road Upper(N) to Palmers Crescent | | Veh. Total |
|---|---|---|---|---|---|---|
| | LV | HV | | LV | HV | |
| 16:00 | 109 | 3 | 112 | 4 | 0 | 4 |
| 16:15 | 113 | 2 | 115 | 4 | 0 | 4 |
| 16:30 | 113 | 3 | 116 | 6 | 0 | 6 |
| 16:45 | 109 | 6 | 115 | 4 | 0 | 4 |
| 17:00 | 103 | 2 | 105 | 4 | 0 | 4 |
| 17:15 | 93 | 3 | 96 | 2 | 0 | 2 |
| 17:30 | 105 | 2 | 107 | 7 | 0 | 7 |
| 17:45 | 102 | 7 | 109 | 5 | 0 | 5 |
| 18:00 | 94 | 4 | 98 | 5 | 0 | 5 |
| 18:15 | 88 | 2 | 90 | 3 | 0 | 3 |
| Total | 1029 | 34 | 1063 | 44 | 0 | 44 |
| Peak Hour | 16:15 | to | 17:15 | | | |
| 16:15 | 113 | 2 | 115 | 4 | 0 | 4 |
| 16:30 | 113 | 3 | 116 | 6 | 0 | 6 |
| 16:45 | 109 | 6 | 115 | 4 | 0 | 4 |
| 17:00 | 103 | 2 | 105 | 4 | 0 | 4 |
| Total | 438 | 13 | 451 | 18 | 0 | 18 |

Site No. 3
Location Kennelsfort Road Upper(N) / Palmers Crescent / Kennelsfort Road Upper(S)
Date 13 April 2021

| Time | B to A - Palmers Crescent to Kennelsfort Road Upper(N) | | Veh. Total | B to C - Palmers Crescent to Kennelsfort Road Upper(S) | | Veh. Total |
|---|---|---|---|---|---|---|
| | LV | HV | | LV | HV | |
| 07:00 | 1 | 0 | 1 | 0 | 0 | 0 |
| 07:15 | 4 | 0 | 4 | 0 | 0 | 0 |
| 07:30 | 6 | 0 | 6 | 5 | 0 | 5 |
| 07:45 | 3 | 1 | 4 | 0 | 0 | 0 |
| 08:00 | 4 | 0 | 4 | 1 | 0 | 1 |
| 08:15 | 6 | 0 | 6 | 0 | 0 | 0 |
| 08:30 | 18 | 0 | 18 | 2 | 0 | 2 |
| 08:45 | 23 | 0 | 23 | 1 | 0 | 1 |
| 09:00 | 5 | 0 | 5 | 1 | 0 | 1 |
| 09:15 | 0 | 0 | 0 | 1 | 0 | 1 |
| Total | 70 | 1 | 71 | 11 | 0 | 11 |
| Peak Hour | 08:15 | to | 09:15 | | | |
| 08:15 | 6 | 0 | 6 | 0 | 0 | 0 |
| 08:30 | 18 | 0 | 18 | 2 | 0 | 2 |
| 08:45 | 23 | 0 | 23 | 1 | 0 | 1 |
| 09:00 | 5 | 0 | 5 | 1 | 0 | 1 |
| Total | 52 | 0 | 52 | 4 | 0 | 4 |

Date 13 April 2021

| Time | B to A - Palmers Crescent to Kennelsfort Road Upper(N) | | Veh. Total | B to C - Palmers Crescent to Kennelsfort Road Upper(S) | | Veh. Total |
|---|---|---|---|---|---|---|
| | LV | HV | | LV | HV | |
| 16:00 | 2 | 0 | 2 | 1 | 0 | 1 |
| 16:15 | 2 | 0 | 2 | 1 | 0 | 1 |
| 16:30 | 4 | 0 | 4 | 2 | 0 | 2 |
| 16:45 | 3 | 0 | 3 | 1 | 0 | 1 |
| 17:00 | 2 | 0 | 2 | 0 | 0 | 0 |
| 17:15 | 5 | 0 | 5 | 2 | 0 | 2 |
| 17:30 | 3 | 0 | 3 | 1 | 0 | 1 |
| 17:45 | 4 | 0 | 4 | 1 | 0 | 1 |
| 18:00 | 4 | 0 | 4 | 1 | 0 | 1 |
| 18:15 | 5 | 0 | 5 | 1 | 0 | 1 |
| Total | 34 | 0 | 34 | 11 | 0 | 11 |
| Peak Hour | 16:15 | to | 17:15 | | | |
| 16:15 | 2 | 0 | 2 | 1 | 0 | 1 |
| 16:30 | 4 | 0 | 4 | 2 | 0 | 2 |
| 16:45 | 3 | 0 | 3 | 1 | 0 | 1 |
| 17:00 | 2 | 0 | 2 | 0 | 0 | 0 |
| Total | 11 | 0 | 11 | 4 | 0 | 4 |

Site No. 3
Location Kennelsfort Road Upper(N) / Palmers Crescent / Kennelsfort Road Upper(S)
Date 13 April 2021

| Time | C to B - Kennelsfort Road Upper(S) to Palmers Crescent | | Veh. Total | C to A - Kennelsfort Road Upper(S) to Kennelsfort Road Upper(N) | | Veh. Total |
|---|---|---|---|---|---|---|
| | LV | HV | | LV | HV | |
| 07:00 | 0 | 0 | 0 | 44 | 3 | 47 |
| 07:15 | 0 | 0 | 0 | 57 | 3 | 60 |
| 07:30 | 0 | 0 | 0 | 67 | 8 | 75 |
| 07:45 | 1 | 0 | 1 | 101 | 5 | 106 |
| 08:00 | 0 | 0 | 0 | 88 | 4 | 92 |
| 08:15 | 2 | 0 | 2 | 133 | 7 | 140 |
| 08:30 | 2 | 0 | 2 | 106 | 3 | 109 |
| 08:45 | 0 | 0 | 0 | 90 | 5 | 95 |
| 09:00 | 4 | 0 | 4 | 125 | 1 | 126 |
| 09:15 | 0 | 0 | 0 | 109 | 9 | 118 |
| Total | 9 | 0 | 9 | 920 | 48 | 968 |
| Peak Hour | 08:15 | to | 09:15 | | | |
| 08:15 | 2 | 0 | 2 | 133 | 7 | 140 |
| 08:30 | 2 | 0 | 2 | 106 | 3 | 109 |
| 08:45 | 0 | 0 | 0 | 90 | 5 | 95 |
| 09:00 | 4 | 0 | 4 | 125 | 1 | 126 |
| Total | 8 | 0 | 8 | 454 | 16 | 470 |

Date 13 April 2021

| Time | C to B - Kennelsfort Road Upper(S) to Palmers Crescent | | Veh. Total | C to A - Kennelsfort Road Upper(S) to Kennelsfort Road Upper(N) | | Veh. Total |
|---|---|---|---|---|---|---|
| | LV | HV | | LV | HV | |
| 16:00 | 0 | 0 | 0 | 160 | 3 | 163 |
| 16:15 | 1 | 0 | 1 | 158 | 4 | 162 |
| 16:30 | 0 | 0 | 0 | 168 | 4 | 172 |
| 16:45 | 1 | 0 | 1 | 161 | 2 | 163 |
| 17:00 | 3 | 0 | 3 | 165 | 5 | 170 |
| 17:15 | 2 | 0 | 2 | 147 | 3 | 150 |
| 17:30 | 1 | 0 | 1 | 143 | 1 | 144 |
| 17:45 | 0 | 0 | 0 | 127 | 2 | 129 |
| 18:00 | 1 | 0 | 1 | 125 | 2 | 127 |
| 18:15 | 0 | 0 | 0 | 120 | 4 | 124 |
| Total | 9 | 0 | 9 | 1474 | 30 | 1504 |
| Peak Hour | 16:15 | to | 17:15 | | | |
| 16:15 | 1 | 0 | 1 | 158 | 4 | 162 |
| 16:30 | 0 | 0 | 0 | 168 | 4 | 172 |
| 16:45 | 1 | 0 | 1 | 161 | 2 | 163 |
| 17:00 | 3 | 0 | 3 | 165 | 5 | 170 |
| Total | 5 | 0 | 5 | 652 | 15 | 667 |

Site No. 3
Location Kennelsfort Road Upper(N) / Palmers Crescent / Kennelsfort Road Upper(S)
Date 13 April 2021

| Time | To Arm A - Kennelsfort Road Upper(N) | | Veh. Total | From Arm A - Kennelsfort Road Upper(N) | | Veh. Total |
|---|---|---|---|---|---|---|
| | LV | HV | | LV | HV | |
| 07:00 | 45 | 3 | 48 | 45 | 2 | 47 |
| 07:15 | 61 | 3 | 64 | 82 | 3 | 85 |
| 07:30 | 73 | 8 | 81 | 98 | 9 | 107 |
| 07:45 | 104 | 6 | 110 | 120 | 6 | 126 |
| 08:00 | 92 | 4 | 96 | 125 | 5 | 130 |
| 08:15 | 139 | 7 | 146 | 161 | 3 | 164 |
| 08:30 | 124 | 3 | 127 | 175 | 9 | 184 |
| 08:45 | 113 | 5 | 118 | 166 | 5 | 171 |
| 09:00 | 130 | 1 | 131 | 201 | 6 | 207 |
| 09:15 | 109 | 9 | 118 | 128 | 7 | 135 |
| Total | 990 | 49 | 1039 | 1301 | 55 | 1356 |
| Peak Hour | 08:15 | to | 09:15 | | | |
| 08:15 | 139 | 7 | 146 | 161 | 3 | 164 |
| 08:30 | 124 | 3 | 127 | 175 | 9 | 184 |
| 08:45 | 113 | 5 | 118 | 166 | 5 | 171 |
| 09:00 | 130 | 1 | 131 | 201 | 6 | 207 |
| Total | 506 | 16 | 522 | 703 | 23 | 726 |

Date 13 April 2021

| Time | To Arm A - Kennelsfort Road Upper(N) | | Veh. Total | From Arm A - Kennelsfort Road Upper(N) | | Veh. Total |
|---|---|---|---|---|---|---|
| | LV | HV | | LV | HV | |
| 16:00 | 162 | 3 | 165 | 113 | 3 | 116 |
| 16:15 | 160 | 4 | 164 | 117 | 2 | 119 |
| 16:30 | 172 | 4 | 176 | 119 | 3 | 122 |
| 16:45 | 164 | 2 | 166 | 113 | 6 | 119 |
| 17:00 | 167 | 5 | 172 | 107 | 2 | 109 |
| 17:15 | 152 | 3 | 155 | 95 | 3 | 98 |
| 17:30 | 146 | 1 | 147 | 112 | 2 | 114 |
| 17:45 | 131 | 2 | 133 | 107 | 7 | 114 |
| 18:00 | 129 | 2 | 131 | 99 | 4 | 103 |
| 18:15 | 125 | 4 | 129 | 91 | 2 | 93 |
| Total | 1508 | 30 | 1538 | 1073 | 34 | 1107 |
| Peak Hour | 16:15 | to | 17:15 | | | |
| 16:15 | 160 | 4 | 164 | 117 | 2 | 119 |
| 16:30 | 172 | 4 | 176 | 119 | 3 | 122 |
| 16:45 | 164 | 2 | 166 | 113 | 6 | 119 |
| 17:00 | 167 | 5 | 172 | 107 | 2 | 109 |
| Total | 663 | 15 | 678 | 456 | 13 | 469 |

Site No. 3
Location Kennelsfort Road Upper(N) / Palmers Crescent / Kennelsfort Road Upper(S)
Date 13 April 2021

| Time | To Arm B - Palmers Crescent | | Veh. Total | From Arm B - Palmers Crescent | | Veh. Total |
|---|---|---|---|---|---|---|
| | LV | HV | | LV | HV | |
| 07:00 | 0 | 0 | 0 | 1 | 0 | 1 |
| 07:15 | 3 | 0 | 3 | 4 | 0 | 4 |
| 07:30 | 0 | 1 | 1 | 11 | 0 | 11 |
| 07:45 | 3 | 0 | 3 | 3 | 1 | 4 |
| 08:00 | 0 | 0 | 0 | 5 | 0 | 5 |
| 08:15 | 4 | 0 | 4 | 6 | 0 | 6 |
| 08:30 | 7 | 0 | 7 | 20 | 0 | 20 |
| 08:45 | 6 | 0 | 6 | 24 | 0 | 24 |
| 09:00 | 14 | 0 | 14 | 6 | 0 | 6 |
| 09:15 | 0 | 0 | 0 | 1 | 0 | 1 |
| Total | 37 | 1 | 38 | 81 | 1 | 82 |
| Peak Hour | 08:15 | to | 09:15 | | | |
| 08:15 | 4 | 0 | 4 | 6 | 0 | 6 |
| 08:30 | 7 | 0 | 7 | 20 | 0 | 20 |
| 08:45 | 6 | 0 | 6 | 24 | 0 | 24 |
| 09:00 | 14 | 0 | 14 | 6 | 0 | 6 |
| Total | 31 | 0 | 31 | 56 | 0 | 56 |

Date 13 April 2021

| Time | To Arm B - Palmers Crescent | | Veh. Total | From Arm B - Palmers Crescent | | Veh. Total |
|---|---|---|---|---|---|---|
| | LV | HV | | LV | HV | |
| 16:00 | 4 | 0 | 4 | 3 | 0 | 3 |
| 16:15 | 5 | 0 | 5 | 3 | 0 | 3 |
| 16:30 | 6 | 0 | 6 | 6 | 0 | 6 |
| 16:45 | 5 | 0 | 5 | 4 | 0 | 4 |
| 17:00 | 7 | 0 | 7 | 2 | 0 | 2 |
| 17:15 | 4 | 0 | 4 | 7 | 0 | 7 |
| 17:30 | 8 | 0 | 8 | 4 | 0 | 4 |
| 17:45 | 5 | 0 | 5 | 5 | 0 | 5 |
| 18:00 | 6 | 0 | 6 | 5 | 0 | 5 |
| 18:15 | 3 | 0 | 3 | 6 | 0 | 6 |
| Total | 53 | 0 | 53 | 45 | 0 | 45 |
| Peak Hour | 16:15 | to | 17:15 | | | |
| 16:15 | 5 | 0 | 5 | 3 | 0 | 3 |
| 16:30 | 6 | 0 | 6 | 6 | 0 | 6 |
| 16:45 | 5 | 0 | 5 | 4 | 0 | 4 |
| 17:00 | 7 | 0 | 7 | 2 | 0 | 2 |
| Total | 23 | 0 | 23 | 15 | 0 | 15 |

Site No. 3
Location Kennelsfort Road Upper(N) / Palmers Crescent / Kennelsfort Road Upper(S)
Date 13 April 2021

| Time | To Arm C - Kennelsfort Road Upper(S) | | Veh. Total | From Arm C - Kennelsfort Road Upper(S) | | Veh. Total |
|---|---|---|---|---|---|---|
| | LV | HV | | LV | HV | |
| 07:00 | 45 | 2 | 47 | 44 | 3 | 47 |
| 07:15 | 79 | 3 | 82 | 57 | 3 | 60 |
| 07:30 | 103 | 8 | 111 | 67 | 8 | 75 |
| 07:45 | 118 | 6 | 124 | 102 | 5 | 107 |
| 08:00 | 126 | 5 | 131 | 88 | 4 | 92 |
| 08:15 | 159 | 3 | 162 | 135 | 7 | 142 |
| 08:30 | 172 | 9 | 181 | 108 | 3 | 111 |
| 08:45 | 161 | 5 | 166 | 90 | 5 | 95 |
| 09:00 | 192 | 6 | 198 | 129 | 1 | 130 |
| 09:15 | 129 | 7 | 136 | 109 | 9 | 118 |
| Total | 1284 | 54 | 1338 | 929 | 48 | 977 |
| Peak Hour | 08:15 | to | 09:15 | | | |
| 08:15 | 159 | 3 | 162 | 135 | 7 | 142 |
| 08:30 | 172 | 9 | 181 | 108 | 3 | 111 |
| 08:45 | 161 | 5 | 166 | 90 | 5 | 95 |
| 09:00 | 192 | 6 | 198 | 129 | 1 | 130 |
| Total | 684 | 23 | 707 | 462 | 16 | 478 |

Date 13 April 2021

| Time | To Arm C - Kennelsfort Road Upper(S) | | Veh. Total | From Arm C - Kennelsfort Road Upper(S) | | Veh. Total |
|---|---|---|---|---|---|---|
| | LV | HV | | LV | HV | |
| 16:00 | 110 | 3 | 113 | 160 | 3 | 163 |
| 16:15 | 114 | 2 | 116 | 159 | 4 | 163 |
| 16:30 | 115 | 3 | 118 | 168 | 4 | 172 |
| 16:45 | 110 | 6 | 116 | 162 | 2 | 164 |
| 17:00 | 103 | 2 | 105 | 168 | 5 | 173 |
| 17:15 | 95 | 3 | 98 | 149 | 3 | 152 |
| 17:30 | 106 | 2 | 108 | 144 | 1 | 145 |
| 17:45 | 103 | 7 | 110 | 127 | 2 | 129 |
| 18:00 | 95 | 4 | 99 | 126 | 2 | 128 |
| 18:15 | 89 | 2 | 91 | 120 | 4 | 124 |
| Total | 1040 | 34 | 1074 | 1483 | 30 | 1513 |
| Peak Hour | 16:15 | to | 17:15 | | | |
| 16:15 | 114 | 2 | 116 | 159 | 4 | 163 |
| 16:30 | 115 | 3 | 118 | 168 | 4 | 172 |
| 16:45 | 110 | 6 | 116 | 162 | 2 | 164 |
| 17:00 | 103 | 2 | 105 | 168 | 5 | 173 |
| Total | 442 | 13 | 455 | 657 | 15 | 672 |

Calculation Reference: AUDIT-764101-211128-1142

**TRIP RATE CALCULATION SELECTION PARAMETERS:**

Land Use : 03 - RESIDENTIAL
Category : C - FLATS PRIVATELY OWNED

## TOTAL VEHICLES

*Selected regions and areas:*

| | | | |
|---|---|---|---|
| **12** | **CONNAUGHT** | | |
| | GA | GALWAY | 1 days |
| **13** | **MUNSTER** | | |
| | WA | WATERFORD | 1 days |
| **14** | **LEINSTER** | | |
| | LU | LOUTH | 3 days |
| **15** | **GREATER DUBLIN** | | |
| | DL | DUBLIN | 7 days |
| **16** | **ULSTER (REPUBLIC OF IRELAND)** | | |
| | MG | MONAGHAN | 1 days |
| **17** | **ULSTER (NORTHERN IRELAND)** | | |
| | AN | ANTRIM | 1 days |

*This section displays the number of survey days per TRICS® sub-region in the selected set*

**Primary Filtering selection:**

*This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.*

Parameter: No of Dwellings
Actual Range: 20 to 332 (units: )
Range Selected by User: 18 to 372 (units: )

Parking Spaces Range: All Surveys Included

Parking Spaces per Dwelling Range: All Surveys Included

Bedrooms per Dwelling Range: All Surveys Included

Percentage of dwellings privately owned: All Surveys Included

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/13 to 23/10/20

*This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.*

*Selected survey days:*

| | |
|---|---|
| Monday | 2 days |
| Tuesday | 6 days |
| Wednesday | 1 days |
| Thursday | 2 days |
| Friday | 3 days |

*This data displays the number of selected surveys by day of the week.*

*Selected survey types:*

| | |
|---|---|
| Manual count | 14 days |
| Directional ATC Count | 0 days |

*This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaking using machines.*

*Selected Locations:*

| | |
|---|---|
| Edge of Town Centre | 4 |
| Suburban Area (PPS6 Out of Centre) | 7 |
| Edge of Town | 1 |
| Neighbourhood Centre (PPS6 Local Centre) | 2 |

*This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.*

*Selected Location Sub Categories:*

*This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.*

**Secondary Filtering selection:**

*Use Class:*

| | |
|---|---|
| C3 | 14 days |

*This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.*

*Population within 500m Range:*

All Surveys Included

*Population within 1 mile:*

| | |
|---|---|
| 1,001 to 5,000 | 1 days |
| 5,001 to 10,000 | 3 days |
| 15,001 to 20,000 | 2 days |
| 20,001 to 25,000 | 1 days |
| 25,001 to 50,000 | 7 days |

*This data displays the number of selected surveys within stated 1-mile radii of population.*

*Population within 5 miles:*

| | |
|---|---|
| 5,001 to 25,000 | 1 days |
| 25,001 to 50,000 | 3 days |
| 50,001 to 75,000 | 2 days |
| 125,001 to 250,000 | 1 days |
| 250,001 to 500,000 | 1 days |
| 500,001 or More | 6 days |

*This data displays the number of selected surveys within stated 5-mile radii of population.*

*Car ownership within 5 miles:*

| | |
|---|---|
| 0.6 to 1.0 | 4 days |
| 1.1 to 1.5 | 10 days |

*This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.*

*Travel Plan:*

| | |
|---|---|
| No | 14 days |

*This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.*

*PTAL Rating:*

| | |
|---|---|
| No PTAL Present | 14 days |

*This data displays the number of selected surveys with PTAL Ratings.*

| | | |
|---|---|---|
| Covid-19 Restrictions | Yes | At least one survey within the selected data set was undertaken at a time of Covid-19 restrictions |

*LIST OF SITES relevant to selection parameters*

| | | | | |
|---|---|---|---|---|
| **1** | **AN-03-C-02** | **BLOCK OF FLATS** | | **ANTRIM** |
| | SUMMERHILL AVENUE | | | |
| | BELFAST | | | |
| | KNOCK | | | |
| | Edge of Town | | | |
| | Residential Zone | | | |
| | Total No of Dwellings: | | 22 | |
| **2** | **DL-03-C-11** | **BLOCK OF FLATS** | | **DUBLIN** |
| | WYCKHAM WAY | | | |
| | DUBLIN | | | |
| | DUNDRUM | | | |
| | Neighbourhood Centre (PPS6 Local Centre) | | | |
| | Residential Zone | | | |
| | Total No of Dwellings: | | 96 | |
| **3** | **DL-03-C-12** | **BLOCK OF FLATS** | | **DUBLIN** |
| | BOOTERSTOWN AVENUE | | | |
| | DUBLIN | | | |
| | Suburban Area (PPS6 Out of Centre) | | | |
| | Residential Zone | | | |
| | Total No of Dwellings: | | 47 | |
| **4** | **DL-03-C-13** | **BLOCK OF FLATS** | | **DUBLIN** |
| | SANDYFORD ROAD | | | |
| | DUBLIN | | | |
| | Neighbourhood Centre (PPS6 Local Centre) | | | |
| | Built-Up Zone | | | |
| | Total No of Dwellings: | | 52 | |
| **5** | **DL-03-C-14** | **BLOCKS OF FLATS** | | **DUBLIN** |
| | BALLINTEER ROAD | | | |
| | DUBLIN | | | |
| | DUNDRUM | | | |
| | Suburban Area (PPS6 Out of Centre) | | | |
| | Residential Zone | | | |
| | Total No of Dwellings: | | 140 | |
| **6** | **DL-03-C-15** | **BLOCKS OF FLATS** | | **DUBLIN** |
| | MONKSTOWN ROAD | | | |
| | DUBLIN | | | |
| | MONKSTOWN | | | |
| | Suburban Area (PPS6 Out of Centre) | | | |
| | Residential Zone | | | |
| | Total No of Dwellings: | | 20 | |
| **7** | **DL-03-C-16** | **BLOCKS OF FLATS** | | **DUBLIN** |
| | BOTANIC AVENUE | | | |
| | DUBLIN | | | |
| | DRUMCONDRA | | | |
| | Suburban Area (PPS6 Out of Centre) | | | |
| | Residential Zone | | | |
| | Total No of Dwellings: | | 31 | |
| **8** | **DL-03-C-17** | **BLOCKS OF FLATS** | | **DUBLIN** |
| | FINGLAS ROAD | | | |
| | DUBLIN | | | |
| | FINGLAS | | | |
| | Suburban Area (PPS6 Out of Centre) | | | |
| | Residential Zone | | | |
| | Total No of Dwellings: | | 332 | |
| **9** | **GA-03-C-01** | **FLATS** | | **GALWAY** |
| | BALLYLOUGHANE ROAD | | | |
| | GALWAY | | | |
| | Suburban Area (PPS6 Out of Centre) | | | |
| | No Sub Category | | | |
| | Total No of Dwellings: | | 34 | |
| **10** | **LU-03-C-01** | **BLOCKS OF FLATS** | | **LOUTH** |
| | DONORE ROAD | | | |
| | DROGHEDA | | | |
| | Edge of Town Centre | | | |
| | Residential Zone | | | |
| | Total No of Dwellings: | | 52 | |

*LIST OF SITES relevant to selection parameters (Cont.)*

| | | | | |
|---|---|---|---|---|
| **11** | **LU-03-C-02**<br>NICHOLAS STREET<br>DUNDALK | **BLOCK OF FLATS** | | **LOUTH** |
| | Edge of Town Centre<br>Residential Zone<br>Total No of Dwellings: | | 33 | |
| **12** | **LU-03-C-03**<br>NICHOLAS STREET<br>DUNDALK | **BLOCK OF FLATS** | | **LOUTH** |
| | Edge of Town Centre<br>Residential Zone<br>Total No of Dwellings: | | 20 | |
| **13** | **MG-03-C-01**<br>MALL ROAD<br>MONAGHAN | **BLOCK OF FLATS** | | **MONAGHAN** |
| | Edge of Town Centre<br>No Sub Category<br>Total No of Dwellings: | | 28 | |
| **14** | **WA-03-C-01**<br>UPPER YELLOW ROAD<br>WATERFORD | **BLOCKS OF FLATS** | | **WATERFORD** |
| | Suburban Area (PPS6 Out of Centre)<br>Residential Zone<br>Total No of Dwellings: | | 51 | |

*This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.*

TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED

## TOTAL VEHICLES

## Calculation factor: 1 DWELLS

**Estimated TRIP rate value per 144 DWELLS shown in shaded columns**
**BOLD print indicates peak (busiest) period**

| | ARRIVALS | | | | DEPARTURES | | | | TOTALS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Range | No. Days | Ave. DWELLS | Trip Rate | Estimated Trip Rate | No. Days | Ave. DWELLS | Trip Rate | Estimated Trip Rate | No. Days | Ave. DWELLS | Trip Rate | Estimated Trip Rate |
| 00:00 - 01:00 | | | | | | | | | | | | |
| 01:00 - 02:00 | | | | | | | | | | | | |
| 02:00 - 03:00 | | | | | | | | | | | | |
| 03:00 - 04:00 | | | | | | | | | | | | |
| 04:00 - 05:00 | | | | | | | | | | | | |
| 05:00 - 06:00 | | | | | | | | | | | | |
| 06:00 - 07:00 | | | | | | | | | | | | |
| 07:00 - 08:00 | 14 | 68 | 0.046 | 6.614 | 14 | 68 | 0.191 | 27.507 | 14 | 68 | 0.237 | 34.121 |
| 08:00 - 09:00 | 14 | 68 | 0.073 | 10.522 | **14** | **68** | **0.248** | **35.775** | **14** | **68** | **0.321** | **46.297** |
| 09:00 - 10:00 | 14 | 68 | 0.079 | 11.424 | 14 | 68 | 0.087 | 12.476 | 14 | 68 | 0.166 | 23.900 |
| 10:00 - 11:00 | 14 | 68 | 0.038 | 5.411 | 14 | 68 | 0.063 | 9.019 | 14 | 68 | 0.101 | 14.430 |
| 11:00 - 12:00 | 14 | 68 | 0.053 | 7.666 | 14 | 68 | 0.068 | 9.770 | 14 | 68 | 0.121 | 17.436 |
| 12:00 - 13:00 | 14 | 68 | 0.067 | 9.620 | 14 | 68 | 0.085 | 12.175 | 14 | 68 | 0.152 | 21.795 |
| 13:00 - 14:00 | 14 | 68 | 0.091 | 13.077 | 14 | 68 | 0.081 | 11.724 | 14 | 68 | 0.172 | 24.801 |
| 14:00 - 15:00 | 14 | 68 | 0.113 | 16.234 | 14 | 68 | 0.080 | 11.574 | 14 | 68 | 0.193 | 27.808 |
| 15:00 - 16:00 | 14 | 68 | 0.100 | 14.430 | 14 | 68 | 0.076 | 10.973 | 14 | 68 | 0.176 | 25.403 |
| 16:00 - 17:00 | 14 | 68 | 0.112 | 16.084 | 14 | 68 | 0.070 | 10.071 | 14 | 68 | 0.182 | 26.155 |
| 17:00 - 18:00 | **14** | **68** | **0.195** | **28.109** | 14 | 68 | 0.082 | 11.875 | 14 | 68 | 0.277 | 39.984 |
| 18:00 - 19:00 | 14 | 68 | 0.182 | 26.154 | 14 | 68 | 0.101 | 14.580 | 14 | 68 | 0.283 | 40.734 |
| 19:00 - 20:00 | | | | | | | | | | | | |
| 20:00 - 21:00 | | | | | | | | | | | | |
| 21:00 - 22:00 | | | | | | | | | | | | |
| 22:00 - 23:00 | | | | | | | | | | | | |
| 23:00 - 24:00 | | | | | | | | | | | | |
| Total Rates: | | | 1.149 | 165.345 | | | 1.232 | 177.519 | | | 2.381 | 342.864 |

*This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.*

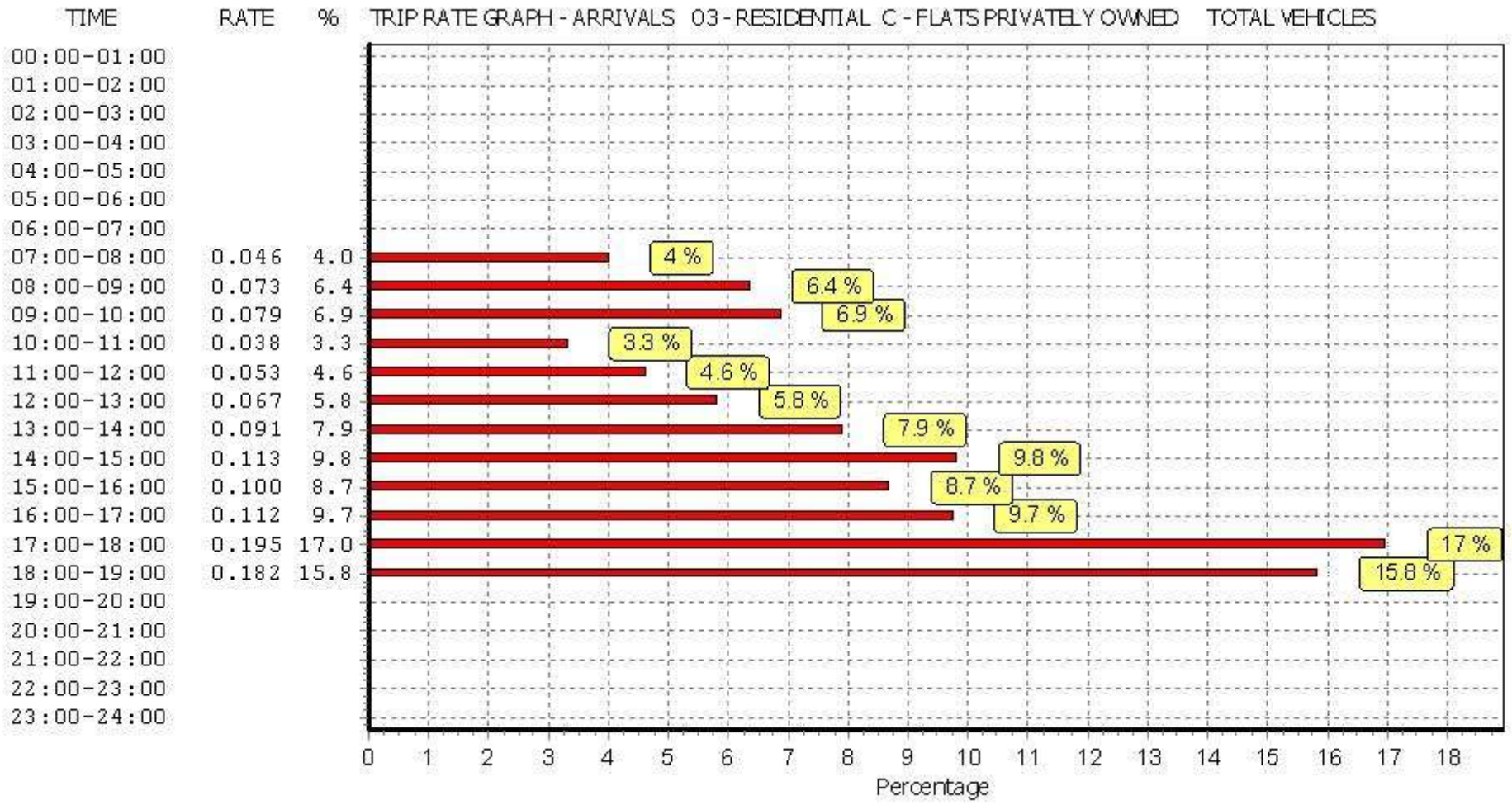
*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*



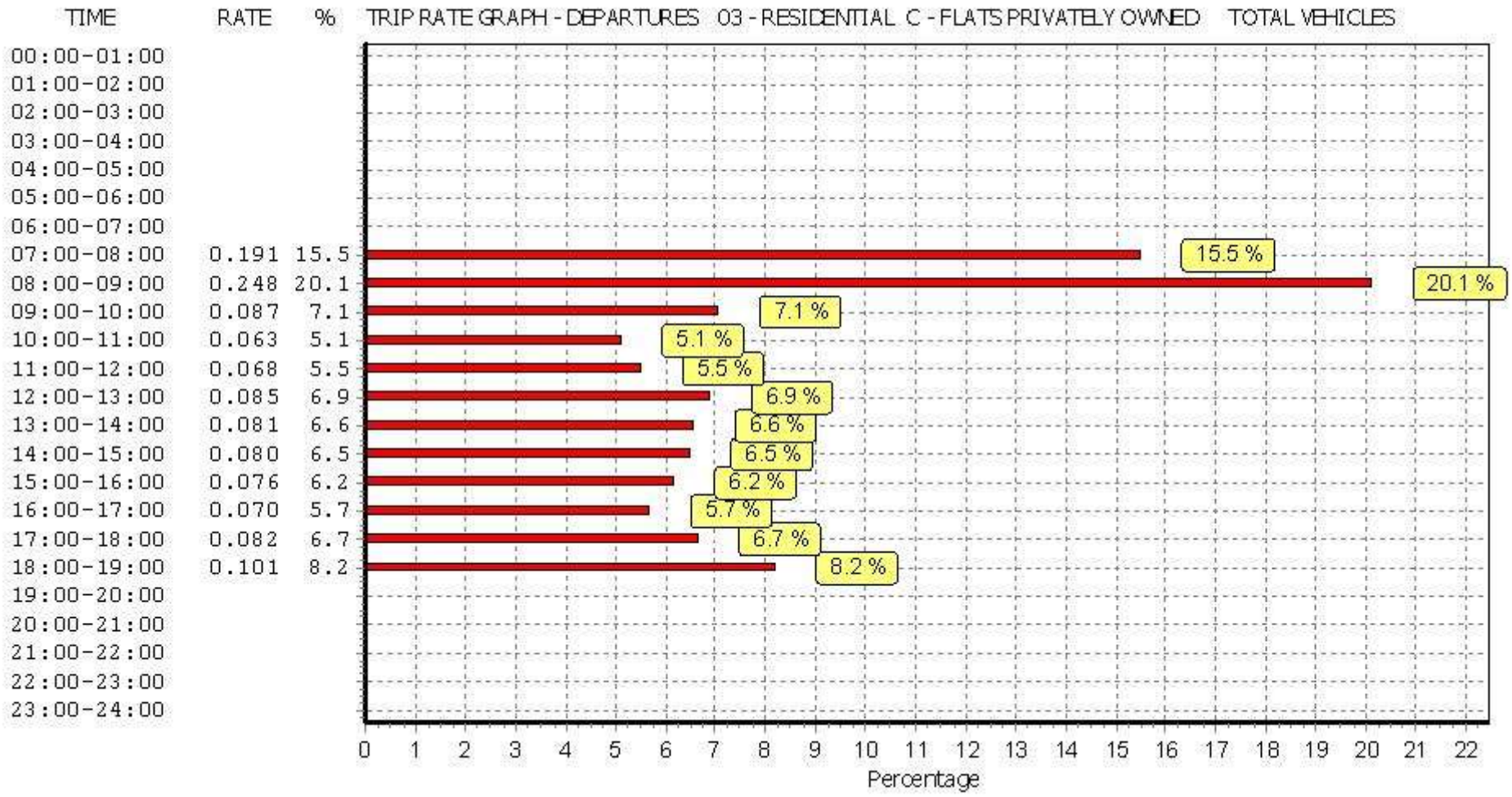
**Parameter summary**

| | |
|---|---|
| Trip rate parameter range selected: | 20 - 332 (units: ) |
| Survey date date range: | 01/01/13 - 23/10/20 |
| Number of weekdays (Monday-Friday): | 14 |
| Number of Saturdays: | 0 |
| Number of Sundays: | 0 |
| Surveys automatically removed from selection: | 0 |
| Surveys manually removed from selection: | 0 |

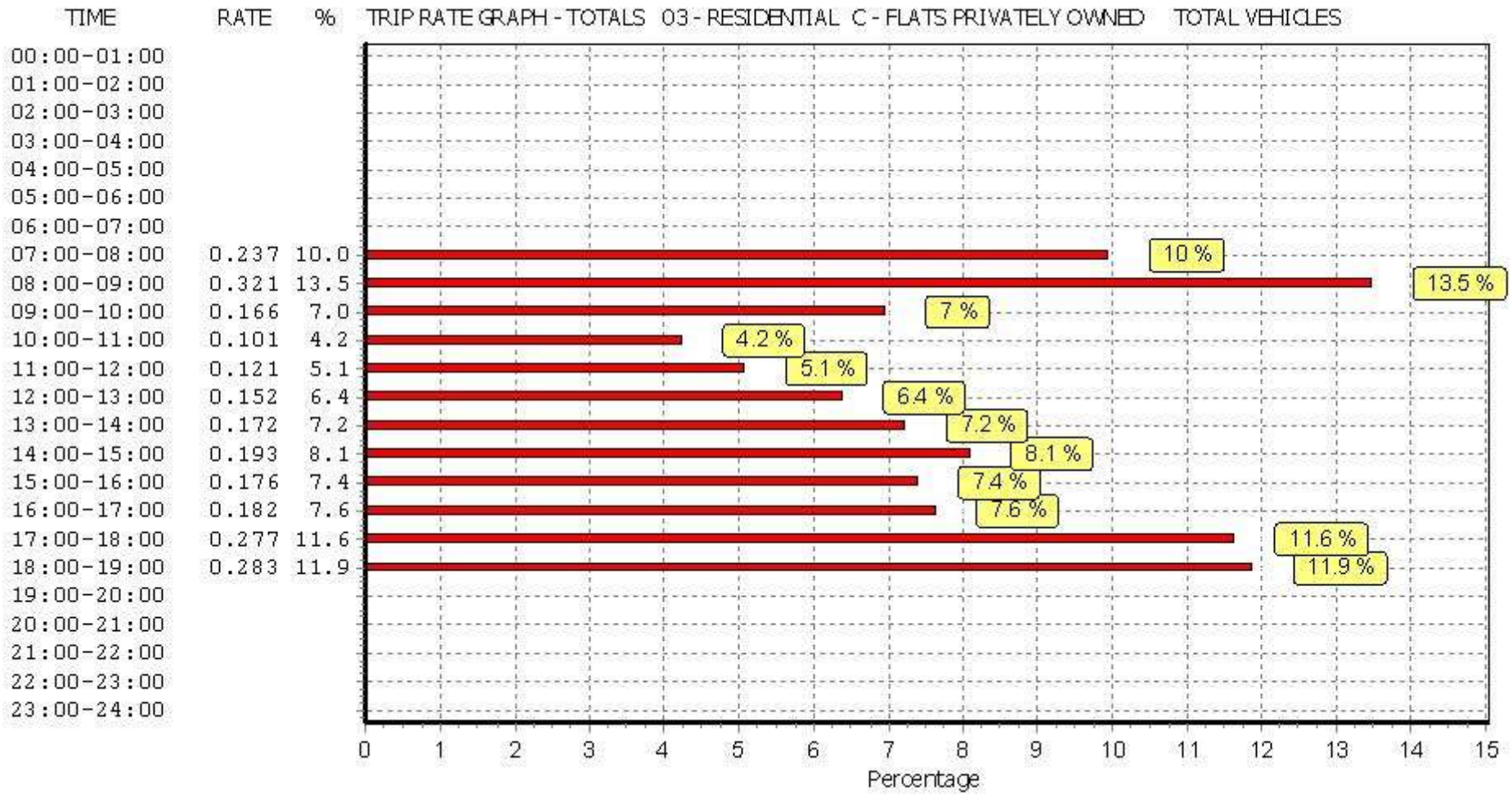
*This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.*




*This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.*




*This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.*




*This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.*

**Junctions 9**

**PICADY 9 - Priority Intersection Module**

Version: 9.5.1.7462

For sales and distribution information, program advice and maintenance, contact TRL:
+44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk

**Filename: KENNELSFORT ROAD UPPER/CHERRY ORCHARD INDUSTRIAL ESTATE ROAD AM PEAK @2039.**
**Report generation date:** 19/04/2021 14:02:48

## Summary of junction performance

| | AM | | | |
|---|---|---|---|---|
| | Queue (PCU) | Delay (s) | RFC | LOS |
| | 2039 | | | |
| **Stream B-C** | 0.3 | 11.33 | 0.21 | B |
| **Stream B-A** | 1.0 | 28.43 | 0.49 | C |
| **Stream C-AB** | 0.3 | 9.39 | 0.19 | A |

*Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.*

## File summary

### File Description

| | |
|---|---|
| **Title** | TIA |
| **Location** | CHERRY ORCHARD |
| **Site number** | 01 |
| **Date** | 19/04/2021 |
| **Version** | PICADY9 |
| **Status** | TIA |
| **Identifier** | NIALL |
| **Client** | SHIPSEY BARRY |
| **Job number** | 120-A31 |
| **Enumerator** | NIALL |
| **Description** | ISSUE |

### Units

| Distance units | Speed units | Traffic units input | Traffic units results | Flow units | Average delay units | Total delay units | Rate of delay units |
|---|---|---|---|---|---|---|---|
| m | kph | PCU | PCU | Per Hour | s | -Min | Per Min |

### Analysis Options

| Calculate Queue Percentiles | Calculate residual capacity | RFC Threshold | Average Delay threshold (s) | Queue threshold (PCU) |
|---|---|---|---|---|
| | | 0.85 | 36.00 | 20.00 |

### Analysis Set Details

| ID | Network flow scaling factor (%) |
|---|---|
| **A1** | 100.000 |

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) |
|---|---|---|---|---|---|---|
| D1 | 2039 | AM | ONE HOUR | 08:00 | 09:30 | 15 |

### Data Errors and Warnings

*No errors or warnings*

## Junction Network

### Junctions

| Junction | Name | Junction type | Major road direction | Use circulating lanes | Junction Delay (s) | Junction LOS |
|---|---|---|---|---|---|---|
| 1 | untitled | T-Junction | Two-way | | 3.11 | A |

### Junction Network Options

| Driving side | Lighting |
|---|---|
| Left | Normal/unknown |

## Arms

### Arms

| Arm | Name | Description | Arm type |
|---|---|---|---|
| A | KENNELSFORT ROAD UPPER NORTH | | Major |
| B | CHERRY ORCHARD INDUSTRIAL ESTATE | | Minor |
| C | KENNELSFORT ROAD UPPER SOUTH | | Major |

### Major Arm Geometry

| Arm | Width of carriageway (m) | Has kerbed central reserve | Has right turn bay | Visibility for right turn (m) | Blocks? | Blocking queue (PCU) |
|---|---|---|---|---|---|---|
| C | 7.00 | No | No | 90.0 | Yes | 1.00 |

*Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.*

### Minor Arm Geometry

| Arm | Minor arm type | Lane Width (Left) (m) | Lane Width (Right) (m) | Visibility to left (m) | Visibility to right (m) |
|---|---|---|---|---|---|
| B | Two lanes | 3.00 | 3.00 | 90 | 90 |

### Slope / Intercept / Capacity

#### Priority Intersection Slopes and Intercepts

| Stream | Intercept (PCU/hr) | Slope for A-B | Slope for A-C | Slope for C-A | Slope for C-B |
|---|---|---|---|---|---|
| B-A | 580 | 0.099 | 0.250 | 0.157 | 0.356 |
| B-C | 715 | 0.102 | 0.259 | - | - |
| C-B | 626 | 0.227 | 0.227 | - | - |

*The slopes and intercepts shown above do NOT include any corrections or adjustments.*
*Streams may be combined, in which case capacity will be adjusted.*
*Values are shown for the first time segment only; they may differ for subsequent time segments.*

## Traffic Demand

| Default vehicle mix | Vehicle mix source | PCU Factor for a HV (PCU) |
|---|---|---|
| Yes | HV Percentages | 2.00 |

### Demand overview (Traffic)

| Arm | Linked arm | Use O-D data | Average Demand (PCU/hr) | Scaling Factor (%) |
|---|---|---|---|---|
| A | KENNELSFORT ROAD UPPER NORTH | Yes | 890 | 100.000 |
| B | CHERRY ORCHARD INDUSTRIAL ESTATE | Yes | 205 | 100.000 |
| C | KENNELSFORT ROAD UPPER SOUTH | Yes | 550 | 100.000 |

## Origin-Destination Data

### Demand (PCU/hr)

| | | To | | |
|---|---|---|---|---|
| | | A | B | C |
| From | A | 0 | 271 | 619 |
| | B | 119 | 0 | 86 |
| | C | 482 | 68 | 0 |

## Vehicle Mix

### Heavy Vehicle Percentages

| | | To | | |
|---|---|---|---|---|
| | | A | B | C |
| From | A | 10 | 10 | 10 |
| | B | 10 | 10 | 10 |
| | C | 10 | 10 | 10 |

## Results

### Results Summary for whole modelled period

| Stream | Max RFC | Max Delay (s) | Max Queue (PCU) | Max LOS |
|---|---|---|---|---|
| B-C | 0.21 | 11.33 | 0.3 | B |
| B-A | 0.49 | 28.43 | 1.0 | D |
| C-AB | 0.19 | 9.39 | 0.3 | A |
| C-A | | | | |
| A-B | | | | |
| A-C | | | | |

### Main Results for each time segment

08:00 - 08:15

| Stream | Total Demand (PCU/hr) | Capacity (PCU/hr) | RFC | Throughput (PCU/hr) | End queue (PCU) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|
| B-C | 65 | 538 | 0.120 | 64 | 0.1 | 8.342 | A |
| B-A | 90 | 368 | 0.243 | 88 | 0.3 | 14.076 | C |
| C-AB | 56 | 522 | 0.108 | 56 | 0.1 | 8.483 | A |
| C-A | 358 | | | 358 | | | |
| A-B | 204 | | | 204 | | | |
| A-C | 466 | | | 466 | | | |

**08:15 - 08:30**

| Stream | Total Demand (PCU/hr) | Capacity (PCU/hr) | RFC | Throughput (PCU/hr) | End queue (PCU) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|
| B-C | 77 | 500 | 0.154 | 77 | 0.2 | 9.350 | A |
| B-A | 107 | 327 | 0.327 | 106 | 0.5 | 17.890 | C |
| C-AB | 71 | 516 | 0.137 | 71 | 0.2 | 8.893 | A |
| C-A | 423 | | | 423 | | | |
| A-B | 244 | | | 244 | | | |
| A-C | 556 | | | 556 | | | |

**08:30 - 08:45**

| Stream | Total Demand (PCU/hr) | Capacity (PCU/hr) | RFC | Throughput (PCU/hr) | End queue (PCU) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|
| B-C | 95 | 445 | 0.213 | 94 | 0.3 | 11.274 | B |
| B-A | 131 | 270 | 0.485 | 129 | 1.0 | 27.745 | C |
| C-AB | 96 | 519 | 0.185 | 96 | 0.3 | 9.366 | A |
| C-A | 509 | | | 509 | | | |
| A-B | 298 | | | 298 | | | |
| A-C | 682 | | | 682 | | | |

**08:45 - 09:00**

| Stream | Total Demand (PCU/hr) | Capacity (PCU/hr) | RFC | Throughput (PCU/hr) | End queue (PCU) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|
| B-C | 95 | 444 | 0.213 | 95 | 0.3 | 11.327 | B |
| B-A | 131 | 270 | 0.485 | 131 | 1.0 | 28.425 | C |
| C-AB | 96 | 519 | 0.185 | 96 | 0.3 | 9.386 | A |
| C-A | 509 | | | 509 | | | |
| A-B | 298 | | | 298 | | | |
| A-C | 682 | | | 682 | | | |

**09:00 - 09:15**

| Stream | Total Demand (PCU/hr) | Capacity (PCU/hr) | RFC | Throughput (PCU/hr) | End queue (PCU) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|
| **B-C** | 77 | 499 | 0.155 | 78 | 0.2 | 9.399 | A |
| **B-A** | 107 | 327 | 0.327 | 109 | 0.6 | 18.317 | C |
| **C-AB** | 71 | 516 | 0.137 | 71 | 0.2 | 8.919 | A |
| **C-A** | 423 | | | 423 | | | |
| **A-B** | 244 | | | 244 | | | |
| **A-C** | 556 | | | 556 | | | |

**09:15 - 09:30**

| Stream | Total Demand (PCU/hr) | Capacity (PCU/hr) | RFC | Throughput (PCU/hr) | End queue (PCU) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|
| **B-C** | 65 | 537 | 0.120 | 65 | 0.2 | 8.385 | A |
| **B-A** | 90 | 368 | 0.244 | 90 | 0.4 | 14.307 | B |
| **C-AB** | 56 | 522 | 0.108 | 57 | 0.1 | 8.512 | A |
| **C-A** | 358 | | | 358 | | | |
| **A-B** | 204 | | | 204 | | | |
| **A-C** | 466 | | | 466 | | | |

**Filename: KENNELSFORT ROAD UPPER/CHERRY ORCHARD INDUSTRIAL ESTATEPM PEAK @ 2039**
**Report generation date:** 19/04/2021 14:15:45

## Summary of junction performance

| | PM | | | |
|---|---|---|---|---|
| | Queue (PCU) | Delay (s) | RFC | LOS |
| | 2039 | | | |
| **Stream B-C** | 0.3 | 10.67 | 0.20 | B |
| **Stream B-A** | 0.9 | 26.85 | 0.45 | C |
| **Stream C-AB** | 0.2 | 8.38 | 0.11 | A |

*Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.*

## File summary

### File Description

| | |
|---|---|
| **Title** | TIA |
| **Location** | CHERRY ORCHARD |
| **Site number** | 01 |
| **Date** | 19/04/2021 |
| **Version** | PICADY9 |
| **Status** | TIA |
| **Identifier** | NIALL |
| **Client** | SHIPSEY BARRY |
| **Job number** | 120-A31 |
| **Enumerator** | NIALL |
| **Description** | ISSUE |

### Units

| Distance units | Speed units | Traffic units input | Traffic units results | Flow units | Average delay units | Total delay units | Rate of delay units |
|---|---|---|---|---|---|---|---|
| m | kph | PCU | PCU | Per Hour | s | -Min | Per Min |

### Analysis Options

| Calculate Queue Percentiles | Calculate residual capacity | RFC Threshold | Average Delay threshold (s) | Queue threshold (PCU) |
|---|---|---|---|---|
| | | 0.85 | 36.00 | 20.00 |

### Analysis Set Details

| ID | Network flow scaling factor (%) |
|---|---|
| **A1** | 100.000 |

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) |
|---|---|---|---|---|---|---|
| D1 | 2039 | PM | ONE HOUR | 16:15 | 17:45 | 15 |

## 2039, PM

### Data Errors and Warnings

*No errors or warnings*

## Junction Network

### Junctions

| Junction | Name | Junction type | Major road direction | Use circulating lanes | Junction Delay (s) | Junction LOS |
|---|---|---|---|---|---|---|
| 1 | untitled | T-Junction | Two-way | | 2.56 | A |

### Junction Network Options

| Driving side | Lighting |
|---|---|
| Left | Normal/unknown |

## Arms

### Arms

| Arm | Name | Description | Arm type |
|---|---|---|---|
| A | KENNELSFORT ROAD UPPER NORTH | | Major |
| B | CHERRY ORCHARD INDUSTRIAL ESTATE | | Minor |
| C | KENNELSFORT ROAD UPPER SOUTH | | Major |

### Major Arm Geometry

| Arm | Width of carriageway (m) | Has kerbed central reserve | Has right turn bay | Visibility for right turn (m) | Blocks? | Blocking queue (PCU) |
|---|---|---|---|---|---|---|
| C | 7.00 | No | No | 90.0 | Yes | 1.00 |

*Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.*

### Minor Arm Geometry

| Arm | Minor arm type | Lane Width (Left) (m) | Lane Width (Right) (m) | Visibility to left (m) | Visibility to right (m) |
|---|---|---|---|---|---|
| B | Two lanes | 3.00 | 3.00 | 90 | 90 |

### Slope / Intercept / Capacity

#### Priority Intersection Slopes and Intercepts

| Stream | Intercept (PCU/hr) | Slope for A-B | Slope for A-C | Slope for C-A | Slope for C-B |
|---|---|---|---|---|---|
| B-A | 580 | 0.099 | 0.250 | 0.157 | 0.356 |
| B-C | 715 | 0.102 | 0.259 | - | - |
| C-B | 626 | 0.227 | 0.227 | - | - |

*The slopes and intercepts shown above do NOT include any corrections or adjustments.*
*Streams may be combined, in which case capacity will be adjusted.*
*Values are shown for the first time segment only; they may differ for subsequent time segments.*

## Traffic Demand

| Default vehicle mix | Vehicle mix source | PCU Factor for a HV (PCU) |
|---|---|---|
| Yes | HV Percentages | 2.00 |

### Demand overview (Traffic)

| Arm | Linked arm | Use O-D data | Average Demand (PCU/hr) | Scaling Factor (%) |
|---|---|---|---|---|
| A | KENNELSFORT ROAD UPPER NORTH | Yes | 760 | 100.000 |
| B | CHERRY ORCHARD INDUSTRIAL ESTATE | Yes | 191 | 100.000 |
| C | KENNELSFORT ROAD UPPER SOUTH | Yes | 687 | 100.000 |

## Origin-Destination Data

### Demand (PCU/hr)

| From | To | | |
|---|---|---|---|
| | A | B | C |
| A | 0 | 141 | 619 |
| B | 189 | 0 | 83 |
| C | 644 | 43 | 0 |

## Vehicle Mix

### Heavy Vehicle Percentages

| From | To | | |
|---|---|---|---|
| | A | B | C |
| A | 10 | 10 | 10 |
| B | 10 | 10 | 10 |
| C | 10 | 10 | 10 |

## Results

### Results Summary for whole modelled period

| Stream | Max RFC | Max Delay (s) | Max Queue (PCU) | Max LOS |
|---|---|---|---|---|
| B-C | 0.20 | 10.67 | 0.3 | B |
| B-A | 0.45 | 26.85 | 0.9 | D |
| C-AB | 0.11 | 8.38 | 0.2 | A |
| C-A | | | | |
| A-B | | | | |
| A-C | | | | |

### Main Results for each time segment

16:15 - 16:30

| Stream | Total Demand (PCU/hr) | Capacity (PCU/hr) | RFC | Throughput (PCU/hr) | End queue (PCU) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|
| B-C | 62 | 551 | 0.113 | 62 | 0.1 | 8.092 | A |
| B-A | 81 | 365 | 0.223 | 80 | 0.3 | 13.820 | B |
| C-AB | 35 | 537 | 0.065 | 35 | 0.1 | 7.881 | A |
| C-A | 482 | | | 482 | | | |
| A-B | 106 | | | 106 | | | |
| A-C | 466 | | | 466 | | | |

**16:30 - 16:45**

| Stream | Total Demand (PCU/hr) | Capacity (PCU/hr) | RFC | Throughput (PCU/hr) | End queue (PCU) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|
| B-C | 75 | 515 | 0.145 | 74 | 0.2 | 8.978 | A |
| B-A | 97 | 324 | 0.300 | 96 | 0.5 | 17.381 | C |
| C-AB | 44 | 531 | 0.082 | 43 | 0.1 | 8.125 | A |
| C-A | 574 | | | 574 | | | |
| A-B | 127 | | | 127 | | | |
| A-C | 556 | | | 556 | | | |

**16:45 - 17:00**

| Stream | Total Demand (PCU/hr) | Capacity (PCU/hr) | RFC | Throughput (PCU/hr) | End queue (PCU) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|
| B-C | 91 | 463 | 0.197 | 91 | 0.3 | 10.633 | B |
| B-A | 119 | 266 | 0.447 | 117 | 0.8 | 26.345 | C |
| C-AB | 58 | 530 | 0.109 | 57 | 0.2 | 8.368 | A |
| C-A | 699 | | | 699 | | | |
| A-B | 155 | | | 155 | | | |
| A-C | 682 | | | 682 | | | |

**17:00 - 17:15**

| Stream | Total Demand (PCU/hr) | Capacity (PCU/hr) | RFC | Throughput (PCU/hr) | End queue (PCU) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|
| B-C | 91 | 462 | 0.198 | 91 | 0.3 | 10.674 | B |
| B-A | 119 | 266 | 0.447 | 119 | 0.9 | 26.855 | C |
| C-AB | 58 | 530 | 0.109 | 58 | 0.2 | 8.378 | A |
| C-A | 699 | | | 699 | | | |
| A-B | 155 | | | 155 | | | |
| A-C | 682 | | | 682 | | | |

**17:15 - 17:30**

| Stream | Total Demand (PCU/hr) | Capacity (PCU/hr) | RFC | Throughput (PCU/hr) | End queue (PCU) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|
| **B-C** | 75 | 514 | 0.145 | 75 | 0.2 | 9.018 | A |
| **B-A** | 97 | 324 | 0.300 | 99 | 0.5 | 17.718 | C |
| **C-AB** | 44 | 531 | 0.082 | 44 | 0.1 | 8.136 | A |
| **C-A** | 574 | | | 574 | | | |
| **A-B** | 127 | | | 127 | | | |
| **A-C** | 556 | | | 556 | | | |

**17:30 - 17:45**

| Stream | Total Demand (PCU/hr) | Capacity (PCU/hr) | RFC | Throughput (PCU/hr) | End queue (PCU) | Delay (s) | Unsignalised level of service |
|---|---|---|---|---|---|---|---|
| **B-C** | 62 | 550 | 0.114 | 63 | 0.1 | 8.131 | A |
| **B-A** | 81 | 365 | 0.223 | 82 | 0.3 | 14.008 | B |
| **C-AB** | 35 | 537 | 0.065 | 35 | 0.1 | 7.894 | A |
| **C-A** | 482 | | | 482 | | | |
| **A-B** | 106 | | | 106 | | | |
| **A-C** | 466 | | | 466 | | | |

Michael Moran
c/o TPS M Moran & Associates
Rathasker Road
Naas
County Kildare

19th November 2021

Dear Michael,

**Proposed Apartment Development at Orchard Gate, 64/65 Cherry Orchard, Ballyfermot, Dublin 10.**

This is a letter to confirm that GoCar can provide 2 shared car club vehicle spaces adjacent to the above proposed development. GoCar representatives have discussed the project with representatives of (TPS Engineers), who are the Engineers for the Project, and are excited to provide a car sharing service at this location.

GoCar also has a number of vehicles within a 10 minute walk of the new development and would expect to continue to grow our service in this area into the future. GoCar will work with the eventual managers of the scheme to promote the service as an alternative to private cars.

GoCar is Ireland's leading car sharing service with over 60,000 members and over 800 cars and vans on fleet. Each GoCar which is placed in a community has the potential to replace the journeys of up to 15 private cars. The Department of Housing's Design Standards for New Apartments - Guidelines for Planning Authorities 2018 outline: "For all types of location, where it is sought to eliminate or reduce car parking provision, it is necessary to ensure... provision is also to be made for alternative mobility solutions including facilities for car sharing club vehicles."

Carsharing is a sustainable service. By allowing multiple people to use the same vehicle at different times, car sharing reduces car ownership, car dependency, congestion, noise and air pollution. It frees up land which would otherwise be used for additional parking spaces. Most GoCar users only use a car when necessary, and walk and use public transport more often than car owners.

By having GoCar car club vehicles in and near a development such as this, residents will have access to pay-as-you-go driving, in close proximity to their homes, which will increase usership of the service.

I trust that this information is satisfactory. For any queries, please do not hesitate to contact me.

Rob Kearns
Head of Growth
GoCar Carsharing Ltd
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