consulting engineers

NRB

Transportation Assessment Report

(incl. Preliminary Travel Plan at Appendix E)

for

Proposed Mixed/Residential Development

At

Site of Silver Granite Pub, Palmerstown, Dublin 20.

SUBMISSION ISSUE

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EXECUTIVE SUMMARY

NRB Consulting Engineers Ltd were appointed to address the Traffic & Transportation issues associated with a planning application for a Mixed Use /Residential Development on an established site at The Silver Granite Public House, Palmerstown, Dublin 20.

The proposed development consists of a 50-unit apartment scheme at upper levels, with ground floor retail & pub/restaurant uses, together with bicycle and car parking.

Car parking is provided within the long-established Silver Granite Car Park on the opposite side of Kennelsfort Road Upper. Indent on-street parking and a dedicated loading bay is provided along Wheatfield Road adjacent the site. The footprint of the site itself incorporates residential bicycle storage parking and also includes refuse storage/management areas. The car & bicycle parking quantum provided is further considered within this Report.

The Non-car alternative modes of travel are further explored in the Preliminary Mobility Management Plan enclosed herein as ***Appendix E***.

This Transportation Assessment Report (TA) has been prepared to address the Traffic and Transportation issues associated with the proposal, the capacity of the existing road network and the impact of the increased scale of development locally, conscious that the site use will generate very low traffic volumes in the context of the busy road network in the area. The Report has been prepared in accordance with TII's Traffic & Transportation Assessment Guidelines and addresses the worst-case traffic impact of the proposal.

We have extracted local traffic data from recent publicly available planning applications, owing to the Covid-19 Pandemic affecting ability to undertake valid and appropriate surveys. This traffic survey data, undertaken in the normal school term out-with any Covid 19 Pandemic lockdown, formed the basis of the study.

The analysis includes the effects of the existing traffic on the local roads and assesses the impact during the traditional peak commuter peaks periods in accordance with Traffic & Transportation Assessment Guidelines.

The Transportation Assessment confirms that the road network and the established car park vehicular access junction arrangement is more than adequate to accommodate the worst-case traffic associated with the facility. This is particularly so given that we have ignored the traffic generated by the existing site uses, so that this represents a very robust approach to the assessment.

The assessment confirms that the construction and full occupation of the scheme will have a negligible and unnoticeable impact upon the operation of the adjacent road network.

Based on our study, we believe that there are no adverse traffic/transportation capacity or operational issues associated with the construction and occupation of the proposed development that would prevent planning permission being granted by South Dublin County Council.

1.0 INTRODUCTION

1.1 This Transportation Assessment (TA) has been prepared by NRB Consulting Engineers Ltd and addresses the Traffic/ Transportation issues arising from the proposed replacement mixed use apartment/retail development on the site of The Silver Granite Pub, Palmerstown, Dublin 20.

1.2 The local area and the subject site is already a long-established destination, in an area containing a mixture of commercial, school & residential developments and in these terms has very well established traffic generation characteristics in its own right. The proposed development, being on a prominent & highly accessible site should be considered in this context. A site location plan for the site is included below as ***Figure 1.1***:

Figure 1.1 - Site Location

1.3 In describing the Receiving Environment and the Proposed Future Environment, this report addresses the following aspects of the proposed development:

- Relative Small Scale of the development in the context of the busy road network (Reflected in the very Low Traffic Generation of the Development),
- Location of the development within the urban area of Palmerstown, with high quality alternative transport available,
- Traffic & Transportation impact,
- Capacity of the established car park vehicular access arrangement to accommodate the worst-case development traffic flows,
- Pedestrian and cyclist permeability & promotion,
- Capacity of the Existing Road Network,
- Adequacy and safety of the existing roads and junctions locally, within the area of influence.
- Impact upon the adjacent affected junctions locally on Kennelsfort Rd Upper.

1.4 A review of the Road Safety Authority (RSA) online collision database indicates that there are no untoward significant accidents on the affected stretches of road network surrounding the site. An extract from the RSA on-line collisions record is included below as ***Figure 1.2***.

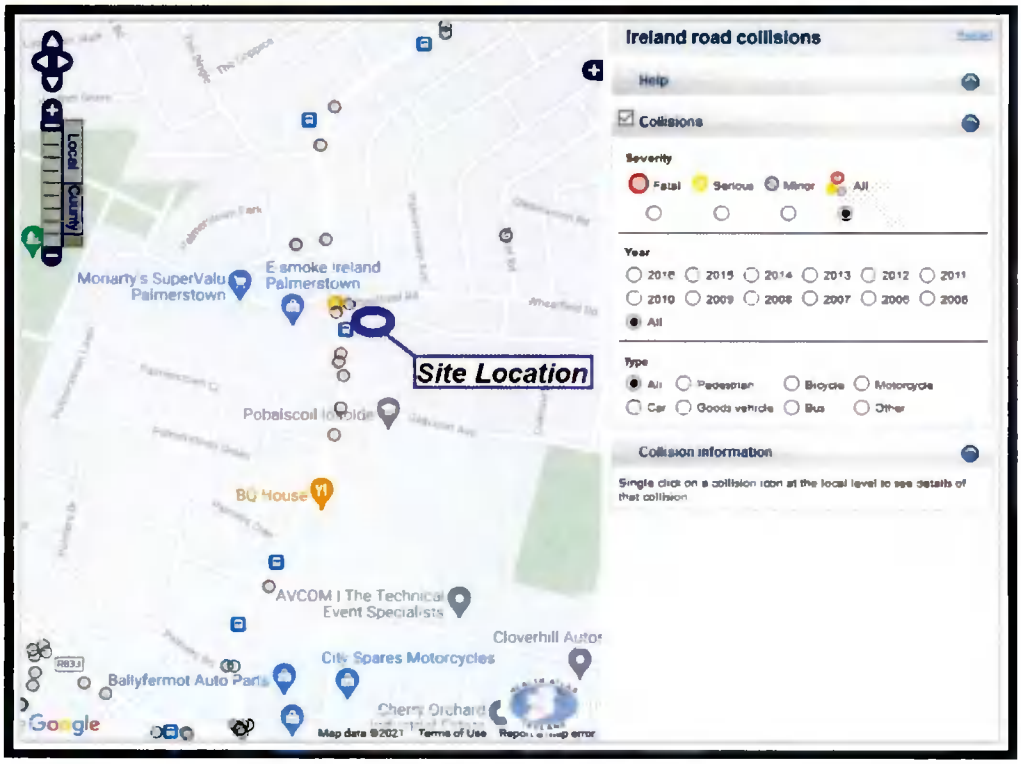


Figure 1.2 - Extract from RSA On-Line Record of Traffic Collisions

1.5 The Recommendations contained within this Transportation Assessment are based on the following sources of information and industry-standard practices; -

- TII Traffic & Transport Assessment Guidelines,
- Design Manual for Urban Roads and Streets,
- Traffic Survey Data from the Non-Covid Period,
- Relevant Design Guidance,
- Our experience in assessing the impact of Developments of this Nature, and
- Site Visits and Observations.

1.6 The Report has been prepared in accordance with the requirements of the TII's Traffic & Transport Assessment Guidelines. These are the professional Guidelines used to assess the impact of developments on public roads.

1.7 The assessment includes a Preliminary Mobility Management Plan /Travel Plan for the site which is included as a separate report which is included as ***Appendix E***.

2.0 EXISTING CONDITIONS, DEVELOPMENT PROPOSALS, PARKING

2.1 The proposal consists of the redevelopment of the long-established Silver Granite Public House Site, with the following elements:

- 50 Residential Apartments at Upper Levels (25 x 1 Bed and 25 x 2 Bed),
- A Gastropub/Restaurant (558m^2 GFA),
- A Spar Shop (226m^2 GFA),
- A Pharmacy (157m^2 GFA),
- An Off-License (147m^2 GFA),
- 128 Bicycle Parking Spaces (96 internal & 32 external), and
- 53 Car Parking Spaces (with 32 dedicated to Residential Uses and 21 for commercial uses).

2.2 Both visitor and residential bicycle parking is provided, with numbers well in excess of the SDCC Development Plan requirements. There are a total of 4 on-street car parking spaces and a new loading bay provided adjacent the site on Wheatfield Road following discussion with SDCC. The remainder of the car parking spaces are provided within the established Silver Granite Car Park located to the west of Kennelsfort Road Upper.

2.3 A raised pedestrian platform is being provided on Kennelsfort Road Upper, together with a Toucan Crossing, as an improvement and adjustment to the established controlled pedestrian crossing, following discussions with SDCC officials. This will facilitate improved pedestrian/cyclist access between the site and its associated car parking.

2.4 The site is bound along the western perimeter by Kennelsfort Road Upper and along the northern perimeter by Wheatfield Rd. To the south and east the site is bounded by long established developments, a petrol filling station to the south and to the east residential development abutting a laneway.

2.5 Kennelsfort Road Upper is a wide single carriageway road, served with footpaths along both sides, and also with dedicated continuous cycleways along its length. It carries a weekday AM Peak Hour 2-way flow of approximately 825 PCUs and a weekday PM Peak Hour 2-Way flow of approximately 777 PCUs, and in these terms, it can be considered as moderately trafficked. An image showing the status and provision of facilities on the road fronting the site is included below as ***Figure 2.1***

Figure 2.1 – Existing Kennelsfort Rd Upper

2.6 To the northern boundary Wheatfield Road, though residential in nature, is also a relatively wide single carriageway road. It too is served with footpaths along both sides, and is traffic calmed with raised platforms. It carries a weekday AM Peak Hour 2-way flow of approximately 161 PCUs and, coincidentally, a weekday PM Peak Hour 2-Way flow also of approximately 161PCUs, and in these terms, it can be considered as quite lightly trafficked. An image showing the current Wheatfield Road approach is included below as ***Figure 2.2***

Figure 2.2 – Existing Wheatfield Rd

2.7 To set the above flows in context, roads of this nature have a theoretical free flow link capacity of approximately 800-1,000 PCUs per-direction per-hour. In this regard, they can be considered to be lightly or moderately trafficked. However, it is accepted that the capacity of any road is generally limited by the capacity of road junctions along its length, particularly in urban areas.

2.8 The junction of Kennelsfort Road Upper and Wheatfield Road takes the form of a simple priority-controlled junction. The junction appears to operate in a satisfactory manner, with driver courtesy facilitating access during peak school periods, when operation can be affected by the adjacent pedestrian crossing.

2.9 A site layout plan showing the development arrangement in relation to the existing site and roads is included herein as ***Appendix A*** along with further details of the development access and egresses.

2.10 In terms of servicing, the commercial elements of the scheme will be facilitated by the provision of the proposed new loading bay on Wheatfield Road. This can be a timed loading bay, with the agreement of SDCC.

2.11 In terms of the residential elements, it is anticipated that, consistent with similar residential apartment schemes, the development will be serviced using traditional weekly refuse lorries as required, collecting the normal refuse types from the wheeled bin staging areas.

2.12 For any individual residential operational day to day requirements, it is expected that they will require small transit vans or small-wheelbase trucks for infrequent servicing of the individual units, vehicles which do not have onerous swept-paths and can easily be facilitated at ground levels in the on-street parking area on Wheatfield Rd, if required.

2.13 The small scale of the subject development in terms of traffic generated is confirmed through the very robust assessment of Traffic Generated, which is addressed further within Section 3 of this Report.

Parking & Accessibility

2.14 The proposed development consists of a residential apartment scheme at upper levels with Pub/Restaurant and Retail at Ground Floor Level. It is provided with landscaped recreational/open space and is supported by a mix of proximate and on-street car parking, combined with dedicated secure bicycle parking areas for residents and visitors. (Refer to Architects Drawings illustrating same, and the annotated site layout drawing included herein as ***Appendix A***).

2.15 The vehicular access arrangement and the layout and design of the internal network will include for tactile paving and dropped kerbs as required. The application includes for the construction of a raised platform crossing, upgrading the adjacent existing controlled pedestrian crossing of Kennelsfort Road Upper.

2.16 It is expected that the majority of residents of the proposed development will either walk and/or use the bicycle as the preferred mode of travel. They will benefit from the existing safe links and facilities in place on the local approach roads, and also the secure storage and parking for cyclists incorporated into the layout design.

Bicycle Parking

2.17 The Department of Housing Planning & Local Government "***Sustainable Urban Housing Design Standards for New Apartments***" includes recommendations on the appropriate level of Bicycle Parking. An extract from the Guidance is included below as ***Figure 2.3***

> *Quantity* – a general minimum standard of 1 cycle storage space per bedroom shall be applied. For studio units, at least 1 cycle storage space shall be provided. Visitor cycle parking shall also be provided at a standard of 1 space per 2 residential units. Any deviation from these standards shall be at the discretion of the planning authority and shall be justified with respect to factors such as location, quality of facilities proposed, flexibility for future enhancement/enlargement, etc.

Figure 2.3 – Extract from National Apartment Guidelines

2.18 The application if the Guidance is reflected in the provision of a total of 128 new dedicated cycle parking spaces, with 96 for residents and 32 external spaces for visitors. With a total of 75 bedrooms and 50 individual units, the bicycle parking provision therefore exceeds the SDCC Development Plan requirement and is in line with new national Design Standards for Apartments. The new Guidance would

require 75 residential bicycle spaces and 25 visitor spaces for the residential elements (1 per bedroom and 1 for every 2 apartment units).

Car Parking

2.19 The development includes a total provision of 53 dedicated car parking spaces with 32 dedicated to the apartments representing a parking ratio of 0.64 per unit. This is considered appropriate in relation to the mix type and the accessible location (Refer to attached MMP, which provides details of accessibility). In addition, 2 motorcycle parking spaces are provided.

2.20 The 'Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities', updates previous guidance in the context of greater evidence and knowledge of current and likely future housing demand in Ireland taking account of the Housing Agency National Statement on Housing Demand and Supply and projected need for additional housing supply out to 2020, the Government's action programme on housing and homelessness Rebuilding Ireland & National Planning Framework Ireland 2040, (subsequent to 2015 guidelines).

2.21 These new guidelines address car parking and include an objective to 'Remove requirements for car-parking in certain circumstances where there are better mobility solutions and to reduce costs.' Under Car Parking - Section 4.18 the guidelines acknowledge that the quantum of car parking or the requirement for any such provision for apartment developments will vary, having regard to the types of location in cities and towns that may be suitable for apartment development, broadly based on proximity and accessibility criteria. The development will be managed and operated by a Management Company. Car parking will not be an automatic entitlement. The development will be continually managed on an on-going basis to ensure that the reduced car dependency nature of the development is continually promoted and enhanced.

2.22 Under Section 4.19 the guidelines note that in larger scale and higher density developments, comprising wholly of apartments in more central locations that are well served by public transport, the default policy is for car parking provision to be **wholly eliminated or substantially reduced**.

2.23 In terms of the stated Policy, we believe that the subject site meets all the requirements for reducing the provision of Private Car Parking, under the headings:

High Density Development ✓

Comprising Wholly of Apartments ✓

Central Location ✓

Well Served by Public Transport ✓

2.24 In these terms the proposed subject development meets all the necessary requirements for reduced car parking provision, in this case a parking 'Ratio' of 0.64 per residential unit. Following our review of the scheme design and location, and following our interpretation of National Policy, we believe that the provision of a total of 53 managed car parking spaces to serve this residential and commercial elements of the development is adequate and is appropriate.

Electric Vehicle Charging

2.25 Car parking spaces provided can easily be upgraded to allow conversion for Electric Vehicles. In the case of residential apartment development of the nature proposed, with specific spaces likely dedicated to specific apartments, it is considered appropriate to facilitate the retrofitting of spaces, based on demand following occupation, rather than a % of spaces being defined as such and provided from the outset, which is a mechanism that has been approved by An Bord Pleanála in recent SHD determinations.

2.26 The entire car park of the subject scheme will therefore be ducted to accept future cabling to serve a charging point for every car space as demanded. Within the parking area, conduits can be run on the walls or ground where charging points can be mounted if and when required.

3.0 VEHICULAR TRIP GENERATION, ASSIGNMENT & DISTRIBUTION

3.1 The Trip Rate Information Computer System (TRICS) database is ordinarily used to ascertain vehicular trip generation associated with the use of any particular site. This represents industry standard practice for Transportation Assessments in Ireland. In this case the worst-case assessment has been undertaken based on traditional Private Residential Apartment Developments, Pub/Restaurant and Local Shop uses (using the licensed version of TRICS V7.8.1).

3.2 A robust and onerous assessment has been undertaken of the impact along the adjacent Kennelsfort Road Upper corridor, in order to ensure that we thoroughly assess the impact (in terms of stress-testing the access junctions and the road capacity impact of the scheme on the important local links). The assessment is undertaken in accordance with the Guidelines in the context of the demonstrably low levels of traffic generated by the proposed development. However, the Guidelines also allow the discounting of Trips to account for extant development, and in this case, we have not deducted traffic to account for the established uses of the Silver Granite premises, and this underscores the robust nature of the assessment.

3.3 We have undertaken the Traffic Generation calculations using the appropriate categories of Private Residential Apartments, Pub/Restaurant & Local Shops. The total Gross Floor area of the convenience shop (e.g., Spar), the Pharmacy and the off-licence have been combined under the 'Local Shops' category. The resulting TRICS Trip Rates applied for the Development in this case are as set out below as ***Table 3.1, Table 3.2 and Table 3.3*** with data output as Appendix B.

Table 3.1; - TRICS Data Summary, 50 No. Residential Apartments

50 Apartments	Arrivals (PCUs)		Departures (PCUs)		Total 2-Way Generated
Network Hour	Per Unit	50 Units	Per Unit	50 Units	
Weekday AM Peak Hr	0.062	3	0.203	10	13
Weekday PM Peak Hr	0.178	9	0.088	4	13

Table 3.2; - TRICS Data Summary, 560m2 Pub/Restaurant

560 m² Pub/Restaurant	Arrivals (PCUs)		Departures (PCUs)		Total 2-Way Generated
Network Hour	Per 100m2	Site	Per 100m2	Site	
Weekday AM Peak Hr	0.000	0	0.000	0	0
Weekday PM Peak Hr	1.754	10	1.208	7	17

Table 3.3; - TRICS Data Summary, 533m2 Total GFA (Shop, Pharmacy & Off Licence)

533 m² Local Shops	Arrivals (PCUs)		Departures (PCUs)		Total 2-Way Generated
Network Hour	Per 100m2	Site	Per 100m2	Site	
Weekday AM Peak Hr	2.929	16	2.625	14	30
Weekday PM Peak Hr	3.957	21	4.201	22	43

3.4 The total traffic generation by the development is then combined and summarised as ***Table 3.4*** below:

Table 3.4; - Total Traffic Generated by Entire Development (TRICS V7.8.1)

Network Hour	Arrivals (PCUs)	Departures (PCUs)
Weekday AM Peak Hr	19	24
Weekday PM Peak Hr	40	33

3.5 We have included herein as ***Appendix B*** the TRICS data output for the elements upon which the above are based - clearly a residential development with local shops located in an established urban area such as Palmerstown Village, in close proximity to centres of employment and public transport will create lower trip rates, but by applying these higher rates the assessment provides a robust assessment of impact.

Assignment/Distribution - Future Year Traffic

3.6 We have used hand assignment techniques based on the observed movements, with the worst-case traffic assigned to the roads based on the observed established traffic patterns, being the industry standard methodology.

3.7 The standard methodology applied was to firstly ascertain the base background traffic conditions for both the weekday AM and weekday PM Commuter Peak periods. We then used the TII PE-PAG-02017 Project Appraisal Guidelines for National Roads Unit 5.3 (Travel Demand Projections 2019, Table 6.1: Central Growth Rates: Annual Growth Factors) Dublin Metropolitan, to establish projected occupation/opening year 2024 and design year 2039 traffic conditions 15 years following opening on the local road network.

3.8 The worst-case traffic based on the content of ***Table 3.4*** above was then applied in order to establish Opening Year and Design Year Traffic Conditions with the proposed development in place and fully occupied. This is all included in the calculations included herein as ***Appendix C***.

3.9 It should be noted that we have selected an opening year of 2024 as being reasonable and appropriate, however, in our experience varying the opening year and design year by 1-3 years will have no significant impact upon the conclusions of the study. In addition, given the favourable results reported in this study, if required to apply higher background traffic conditions for any reason we would not anticipate any changes whatsoever to the conclusions.

3.10 Traffic growth factors for future year assessments were calculated from data obtained in the TII PE-PAG-02017 Project Appraisal Guidelines for National Roads Unit 5.3 which provides the recommended method of predicting future year traffic growth on Roads. Calculations of the relevant growth factors are included in ***Table 3.5*** below (based on tabulated 'Central Growth' in the Dublin Area). It should be noted that any requirement to use different or higher growth factors will also have no implications whatsoever for the conclusions of the study.

Table 3.5 - Traffic Growth Rates, TII Travel Demand Projections Unit 5.3

Year	to Year	Table 6.1:
Surveyed	2024	1.118
2024	2039	1.152

3.11 The resulting Traffic Flow Projections and Figures within ***Appendix C*** allowed the assessment of impact of the development to be undertaken.

4.0 TRAFFIC IMPACT - THRESHOLD ASSESSMENT/TRAFFIC CAPACITY ANALYSIS

4.1 The Institution of Highways and Transportation (IHT) Guidelines for Traffic Impact Assessment and the TII Traffic and Transport Assessment Guidelines sets out a strict mechanism for assessment of developments of this nature and determining whether further assessment is indeed required.

4.2 This TII Traffic and Transport Assessment Guidelines requires a **Threshold Assessment** of the impact on the local roads to be provided in order to determine whether further, more detailed modelling and assessment of particular critical junctions is necessary.

4.3 The professional guidance referenced above sets out specific increases in traffic volume associated with new development, which, if breached, requires further, more detailed analysis and assessment to be undertaken. The recommendation is that, if the expected increase is **5%** for networks that are considered heavily trafficked or congested, then further analysis is warranted. In this case, given the location, for robustness the 5% threshold has been applied.

4.4 In this regard, it is demonstrated herein that the proposed opening and occupation of the entire development, with very low volumes of vehicular traffic added to an already busy network, will not result in any significant or noticeable level of new trips on the local roads, with all anticipated traffic increases at and beyond the site's car park access expected to be **well below** the Industry-Standard level of 5% above which further assessment is required.

4.5 Our assessment, included within ***Appendix C***, (Refer Page 3 of Appendix C) confirms that the absolute worst case traffic increase on the adjacent road network junctions are as summarised below as ***Table 4.1*** and ***Table 4.2***

Table 4.1; - Threshold Assessment, Worst-Case Impact - AM Peak Hour 8-9am

Assessed Road - Scenario - Year/Period	Traffic Increase %
Wheatfield Road/Kennelsfort Rd Upper T-Junction	2.1%
Kennelsfort Road Upper South of Car Park Access	2.4%

Table 4.2; - Threshold Assessment, Worst-Case Impact - PM Peak Hour 5-6pm

Assessed Road - Scenario - Year/Period	Traffic Increase %
Wheatfield Road/Kennelsfort Rd Upper T-Junction	3.9%
Kennelsfort Road Upper South of Car Park Access	4.3%

4.6 The Threshold assessment clearly confirms that, beyond the car park vehicular access, the worst-case traffic increase are in all cases imperceptible AND significantly below the IHT and TII recommended level of 5% above which further assessment is warranted. It should also be recognised that the above assessment ignores the fact that the site currently generates traffic movements, and in these terms the assessment is further robust, in that the net effect of the proposed new development on local traffic flows will likely be considerably less.

4.7 To set these increased levels of traffic in context, the day-to-day variation in traffic volume (due to day of week or weather conditions) is accepted as being 10%, so, in this context alone, increases of in all cases less than 5% in Traffic on the local roads will go entirely unnoticed.

4.8 It is clear that the introduction of the proposed development will have an absolutely negligible and unnoticeable impact upon vehicular traffic conditions locally.

ACCESS JUNCTION CAPACITY ANALYSIS

4.9 We have used the TII-approved software package 'Junctions 9' PICADY' (**P**riority **I**ntersection **C**apacity and **D**elay**Y**) software package (as part of the TRL Package 'Junction 9') to assess the capacity of the priority-controlled access junction at the car park on Kennelsfort Road Upper to accommodate the completed development.

4.10 PiCADY produces results based on a ratio of flow to capacity (RFC) and queue length. An RFC greater that 1.00 indicates that a junction is operating at or above capacity, with 0.85 considered to be the optimum RFC value. We have appended the detailed computer simulation model results (PiCADY Outputs) of the junction modelling for the proposed site access in ***Appendix D.***

4.11 A summary of the results is reproduced below as ***Table 4.3***

Table 4.3 - Junctions9 PiCADY Summary Results, Car Park Access T Junction

Modelled Scenario	*Period Mean Max Q (PCUs)*	*Period Max RFC*
2024 Opening Year AM Peak	<1	0.06
2024 Opening Year PM Peak	<1	0.09
2039 Design Year AM Peak	<1	0.07
2039 Design Year PM Peak	<1	0.09

4.12 The results of the modelling clearly show that the car park access junction will have significantly more than adequate capacity to accommodate the worst-case traffic associated with the entire lands being developed and fully occupied. All of the RFCs are below the theoretical optimum capacity of 0.85 and no queuing is anticipated.

5.0 CONCLUSIONS

5.1 This Transportation Assessment Report assesses the traffic and transportation impact of the proposal to construct and occupy the proposed Mixed Use /Residential Development on an established site at The Silver Granite Public House, Palmerstown, Dublin 20.

5.2 This Report has been prepared in accordance with the TII Traffic & Transport Assessment Guidelines and is based on industry-standard high Trip Generation Rates, in order to provide an onerous and robust assessment of the impact of the proposed development.

5.3 The impact of the development traffic on the local roads has been modelled and assessed, based on a traffic survey/vehicle turning movement survey during normal school period, outside any Covid 19 Pandemic Lockdown measures. Appropriate traffic growth factors have been applied to establish selected opening year and design year traffic conditions.

5.4 The proposed development is appropriately located within the urban area of Palmerstown and is well served by public transport as identified in the enclosed Mobility Management Plan. The site is also well served by pedestrian and cycle linkages. The site is therefore ideally well placed to take advantage of non-car modes of travel.

5.5 Controlled & reduced car parking numbers are proposed for the scheme in compliance with the requirements of the "Sustainable Urban Housing Design Standards for New Apartments". Copious bicycle parking and storage is provided.

5.6 This report demonstrates that the proposed Development will have an absolutely negligible impact upon the established local traffic conditions and can easily be accommodated on the road network without any capacity concerns arising.

5.7 The assessment also confirms that the established car park access junction is of more than adequate capacity to accommodate the worst-case traffic associated with the proposed development.

5.8 The assessment includes a Preliminary Mobility Management Plan /Travel Plan for the site which is included as ***Appendix E***.

5.9 It is considered that there are no significant Operational Traffic Safety or Road Capacity issues that prevent a positive determination of the application by South Dublin County Council.

APPENDICES - CONTENT

A	Proposed Development – Layout & Access
B	TRICS Trip Generation Output *(Residential Apts., Pub/Rest & Local Shop Uses)*
C	Traffic Surveys, Trip Distribution & Network Traffic Flow Diagrams
D	PiCADY Junction Capacity Model Output – Kennelsfort Rd Upper Site Access
E	Preliminary Development Mobility Management Plan

NRB consulting engineers

APPENDIX A

Proposed Development Layout & Access

NRB consulting engineers

APPENDIX B

TRICS Trip Generation Output
(Residential Apts., Pub/Rest & Local Shop Uses)

Calculation Reference: AUDIT-160301-210428-0402

TRIP RATE CALCULATION SELECTION PARAMETERS:

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

Selected regions and areas:

03	**SOUTH WEST**		
	DC	DORSET	1 days
	DV	DEVON	1 days
04	**EAST ANGLIA**		
	CA	CAMBRIDGESHIRE	1 days
	NF	NORFOLK	2 days
	SF	SUFFOLK	3 days
05	**EAST MIDLANDS**		
	DS	DERBYSHIRE	1 days
	LE	LEICESTERSHIRE	1 days
	NT	NOTTINGHAMSHIRE	2 days
06	**WEST MIDLANDS**		
	WM	WEST MIDLANDS	1 days
07	**YORKSHIRE & NORTH LINCOLNSHIRE**		
	RI	EAST RIDING OF YORKSHIRE	1 days
	SY	SOUTH YORKSHIRE	1 days
08	**NORTH WEST**		
	MS	MERSEYSIDE	2 days
09	**NORTH**		
	CB	CUMBRIA	3 days
10	**WALES**		
	CO	CONWY	1 days
11	**SCOTLAND**		
	EB	CITY OF EDINBURGH	1 days
	SA	SOUTH AYRSHIRE	1 days
	SR	STIRLING	3 days
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

TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED
TOTAL VEHICLES
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	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	40	61	0.045	40	61	0.155	40	61	0.200
08:00 - 09:00	40	61	0.062	**40**	**61**	**0.203**	40	61	0.265
09:00 - 10:00	40	61	0.076	40	61	0.088	40	61	0.164
10:00 - 11:00	40	61	0.054	40	61	0.073	40	61	0.127
11:00 - 12:00	40	61	0.064	40	61	0.077	40	61	0.141
12:00 - 13:00	40	61	0.083	40	61	0.079	40	61	0.162
13:00 - 14:00	40	61	0.075	40	61	0.088	40	61	0.163
14:00 - 15:00	40	61	0.092	40	61	0.087	40	61	0.179
15:00 - 16:00	40	61	0.105	40	61	0.069	40	61	0.174
16:00 - 17:00	40	61	0.120	40	61	0.080	40	61	0.200
17:00 - 18:00	**40**	**61**	**0.178**	40	61	0.088	**40**	**61**	**0.266**
18:00 - 19:00	40	61	0.155	40	61	0.100	40	61	0.255
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.109			1.187			2.296

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.

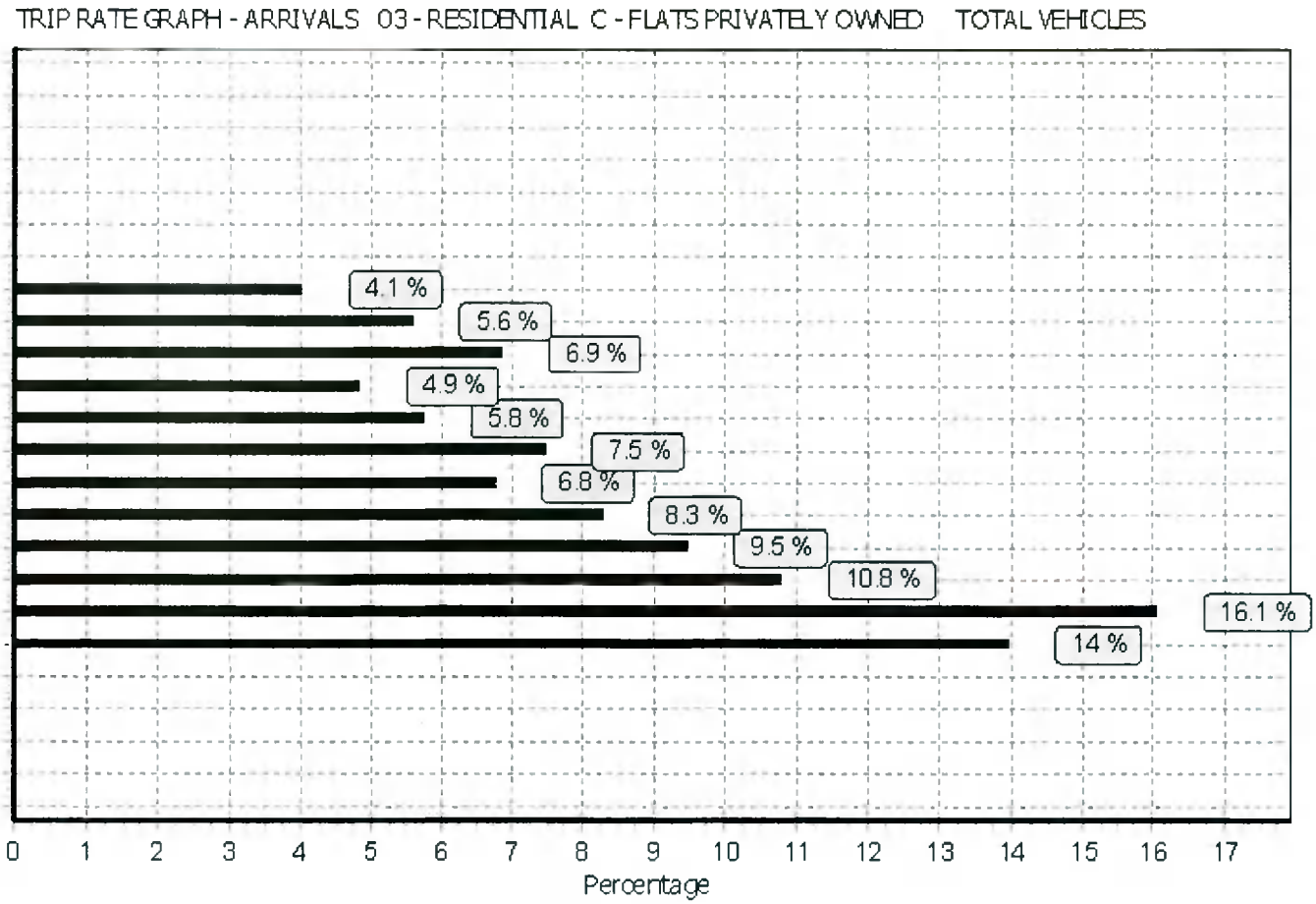
*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected 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:	9 - 332 (units:)
Survey date date range:	01/01/13 - 23/10/20
Number of weekdays (Monday-Friday):	40
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.

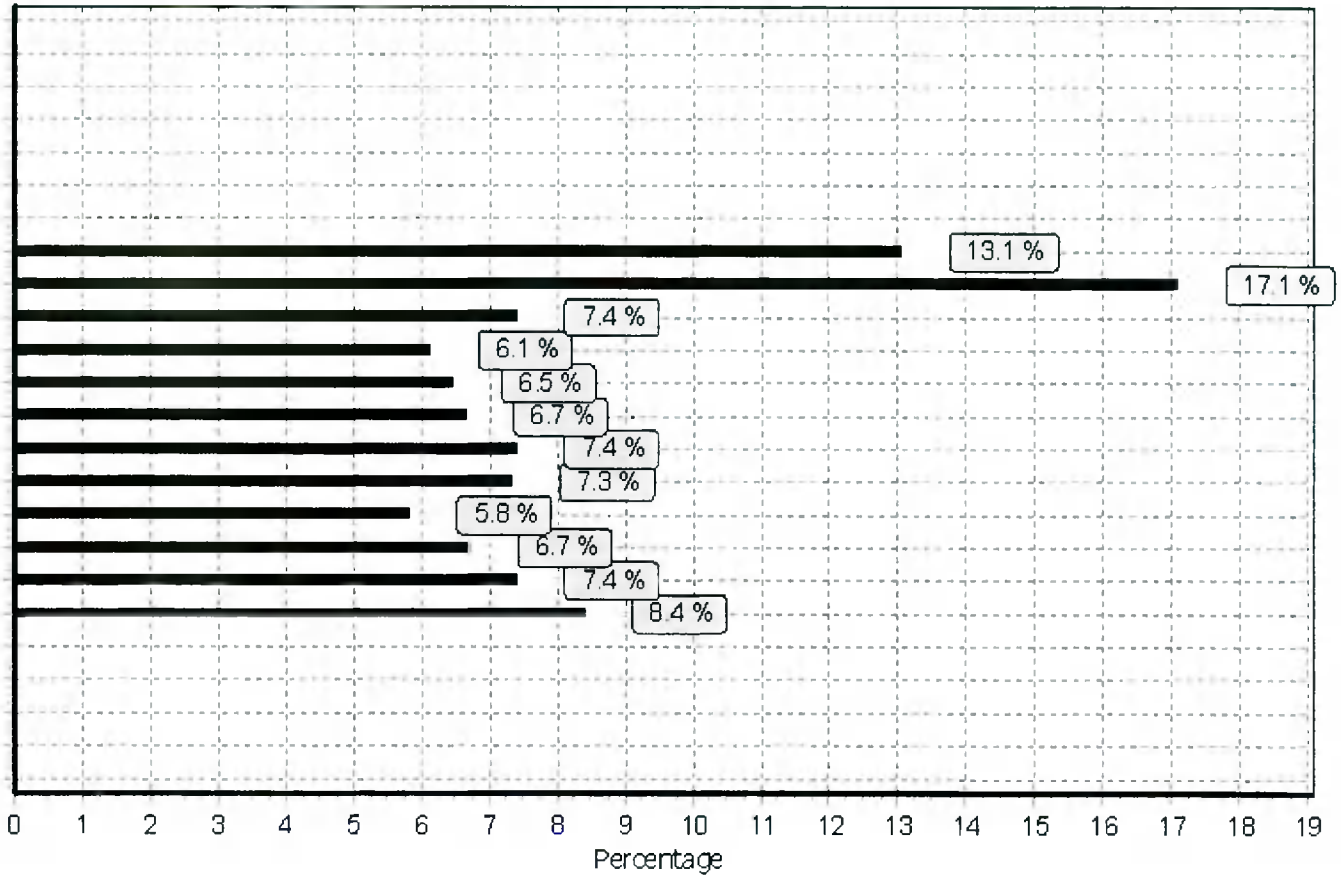
TIME	RATE	%
00:00-01:00		
01:00-02:00		
02:00-03:00		
03:00-04:00		
04:00-05:00		
05:00-06:00		
06:00-07:00		
07:00-08:00	0.045	4.1
08:00-09:00	0.062	5.6
09:00-10:00	0.076	6.9
10:00-11:00	0.054	4.9
11:00-12:00	0.064	5.8
12:00-13:00	0.083	7.5
13:00-14:00	0.075	6.8
14:00-15:00	0.092	8.3
15:00-16:00	0.105	9.5
16:00-17:00	0.120	10.8
17:00-18:00	0.178	16.1
18:00-19:00	0.155	14.0
19:00-20:00		
20:00-21:00		
21:00-22:00		
22:00-23:00		
23:00-24:00		



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.

TIME	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	0.155	13.1
08:00-09:00	0.203	17.1
09:00-10:00	0.088	7.4
10:00-11:00	0.073	6.1
11:00-12:00	0.077	6.5
12:00-13:00	0.079	6.7
13:00-14:00	0.088	7.4
14:00-15:00	0.087	7.3
15:00-16:00	0.069	5.8
16:00-17:00	0.080	6.7
17:00-18:00	0.088	7.4
18:00-19:00	0.100	8.4
19:00-20:00		
20:00-21:00		
21:00-22:00		
22:00-23:00		
23:00-24:00		

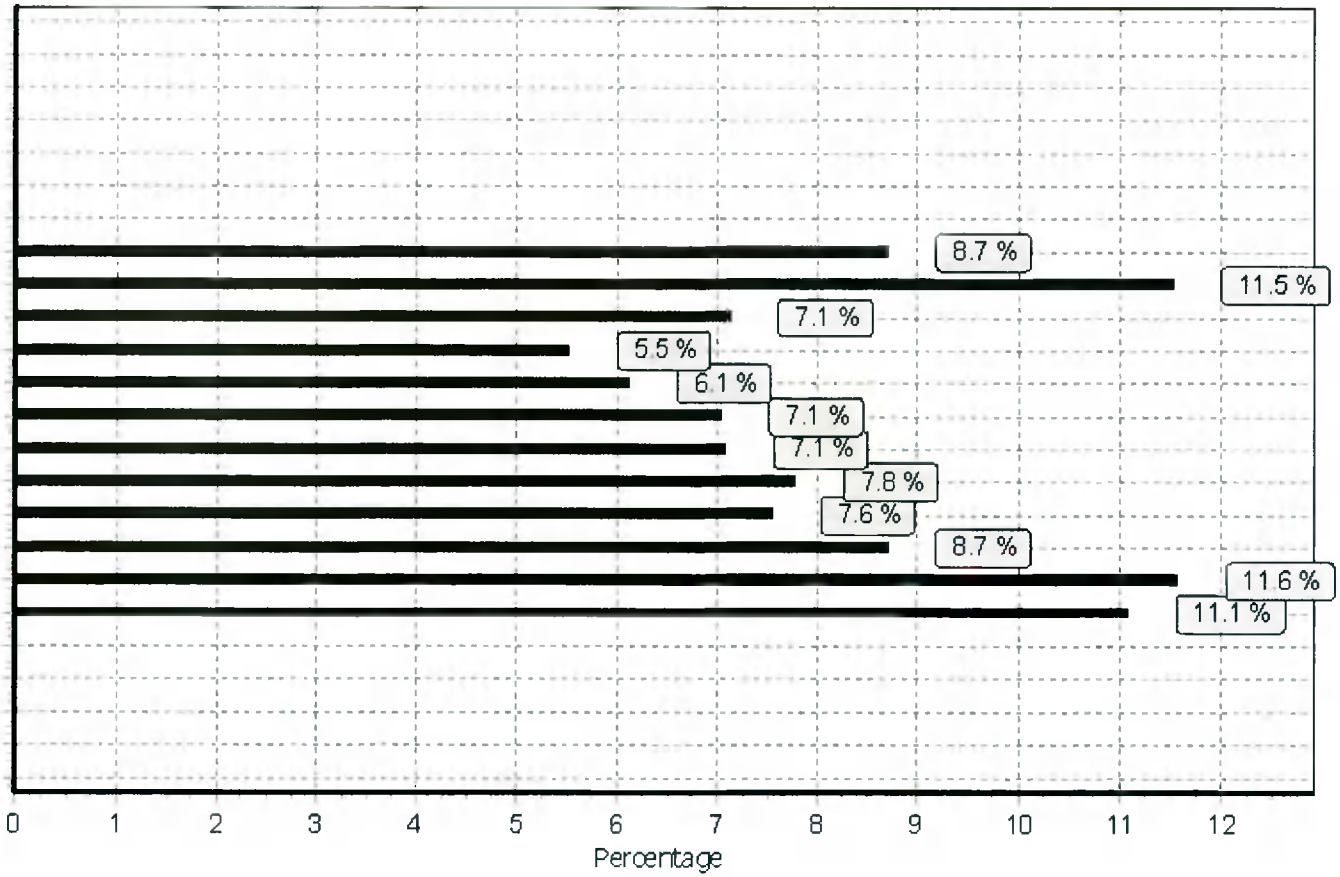
TRIP RATE GRAPH - DEPARTURES 03 - RESIDENTIAL C - FLATS PRIVATELY OWNED TOTAL VEHICLES



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.

TIME	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	0.200	8.7
08:00-09:00	0.265	11.5
09:00-10:00	0.164	7.1
10:00-11:00	0.127	5.5
11:00-12:00	0.141	6.1
12:00-13:00	0.162	7.1
13:00-14:00	0.163	7.1
14:00-15:00	0.179	7.8
15:00-16:00	0.174	7.6
16:00-17:00	0.200	8.7
17:00-18:00	0.266	11.6
18:00-19:00	0.255	11.1
19:00-20:00		
20:00-21:00		
21:00-22:00		
22:00-23:00		
23:00-24:00		

TRIP RATE GRAPH - TOTALS 03 - RESIDENTIAL C - FLATS PRIVATELY OWNED TOTAL VEHICLES



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.

Calculation Reference: AUDIT-160301-210428-0449

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 06 - HOTEL, FOOD & DRINK
Category : C - PUB/RESTAURANT
TOTAL VEHICLES

Selected regions and areas:

03	**SOUTH WEST**		
	BR	BRISTOL CITY	1 days
04	**EAST ANGLIA**		
	SF	SUFFOLK	1 days
05	**EAST MIDLANDS**		
	LN	LINCOLNSHIRE	1 days
	NR	NORTHAMPTONSHIRE	1 days
	NT	NOTTINGHAMSHIRE	1 days
06	**WEST MIDLANDS**		
	ST	STAFFORDSHIRE	1 days
	WK	WARWICKSHIRE	1 days
	WM	WEST MIDLANDS	1 days
	WO	WORCESTERSHIRE	1 days
07	**YORKSHIRE & NORTH LINCOLNSHIRE**		
	WY	WEST YORKSHIRE	1 days
08	**NORTH WEST**		
	CH	CHESHIRE	1 days
	GM	GREATER MANCHESTER	1 days
	LC	LANCASHIRE	2 days
09	**NORTH**		
	DH	DURHAM	1 days
	TW	TYNE & WEAR	1 days
10	**WALES**		
	SW	SWANSEA	1 days
11	**SCOTLAND**		
	RF	RENFREWSHIRE	1 days
13	**MUNSTER**		
	TI	TIPPERARY	1 days
14	**LEINSTER**		
	WC	WICKLOW	1 days
15	**GREATER DUBLIN**		
	DL	DUBLIN	1 days
16	**ULSTER (REPUBLIC OF IRELAND)**		
	DN	DONEGAL	1 days

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

TRIP RATE for Land Use 06 - HOTEL, FOOD & DRINK/C - PUB/RESTAURANT

TOTAL VEHICLES

Calculation factor: 100 sqm

BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00	1	1550	0.065	1	1550	0.129	1	1550	0.194
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	1	600	0.000	1	600	0.000	1	600	0.000
08:00 - 09:00	1	600	0.000	1	600	0.000	1	600	0.000
09:00 - 10:00	1	600	0.000	1	600	0.000	1	600	0.000
10:00 - 11:00	21	616	0.479	21	616	0.301	21	616	0.780
11:00 - 12:00	21	616	0.858	21	616	0.379	21	616	1.237
12:00 - 13:00	**22**	**625**	**2.278**	22	625	0.932	22	625	3.210
13:00 - 14:00	22	625	1.747	22	625	1.681	22	625	3.428
14:00 - 15:00	22	625	1.092	22	625	1.456	22	625	2.548
15:00 - 16:00	22	625	0.997	22	625	0.975	22	625	1.972
16:00 - 17:00	22	625	1.245	22	625	0.902	22	625	2.147
17:00 - 18:00	22	625	1.754	22	625	1.208	22	625	2.962
18:00 - 19:00	22	625	2.242	22	625	1.907	22	625	4.149
19:00 - 20:00	22	625	2.060	**22**	**625**	**2.431**	**22**	**625**	**4.491**
20:00 - 21:00	22	625	1.499	22	625	2.023	22	625	3.522
21:00 - 22:00	22	625	0.975	22	625	1.361	22	625	2.336
22:00 - 23:00	22	625	0.604	22	625	1.623	22	625	2.227
23:00 - 24:00	18	587	0.378	18	587	1.022	18	587	1.400
Total Rates:			18.273			18.330			36.603

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.

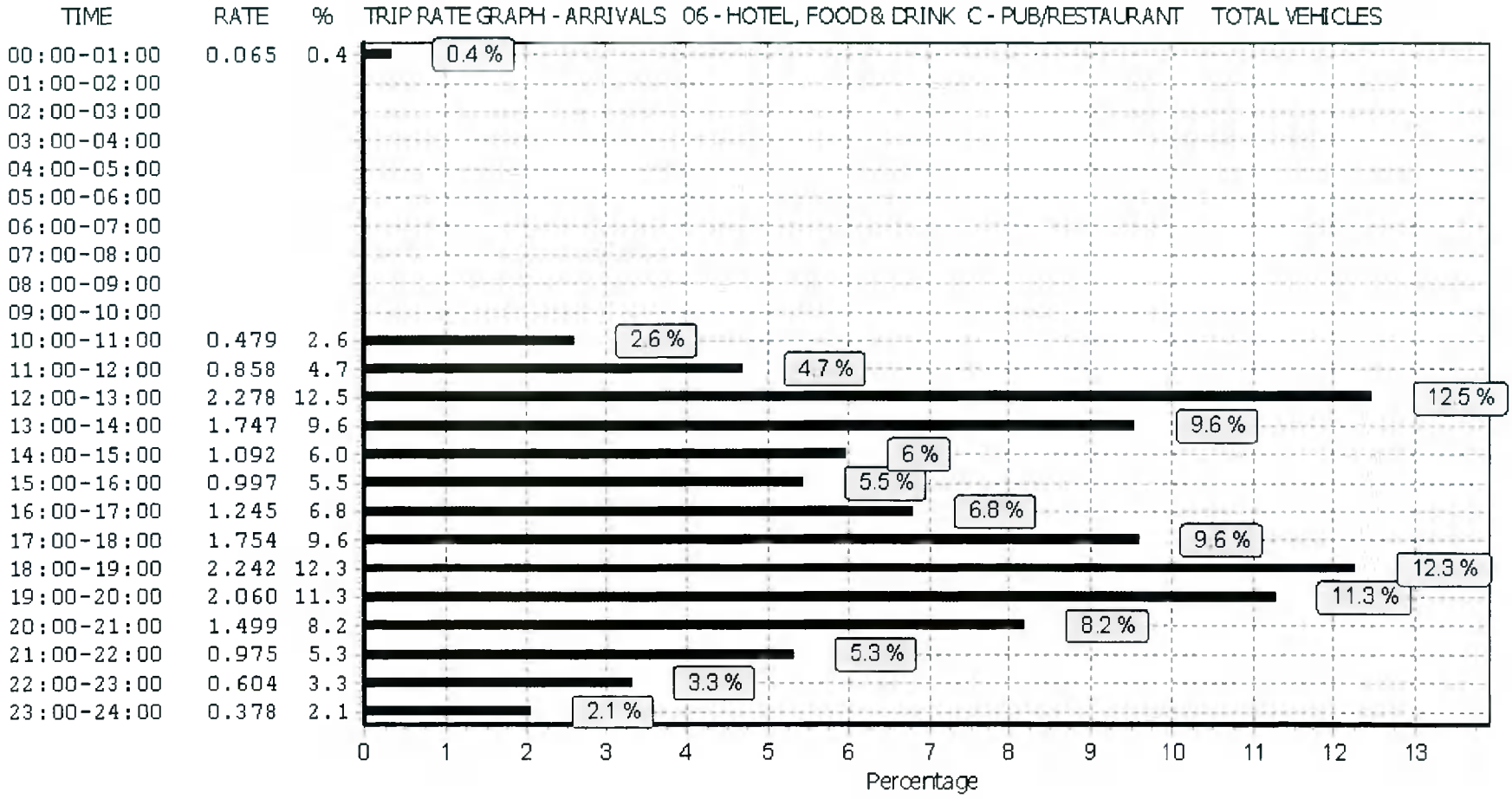
*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected 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

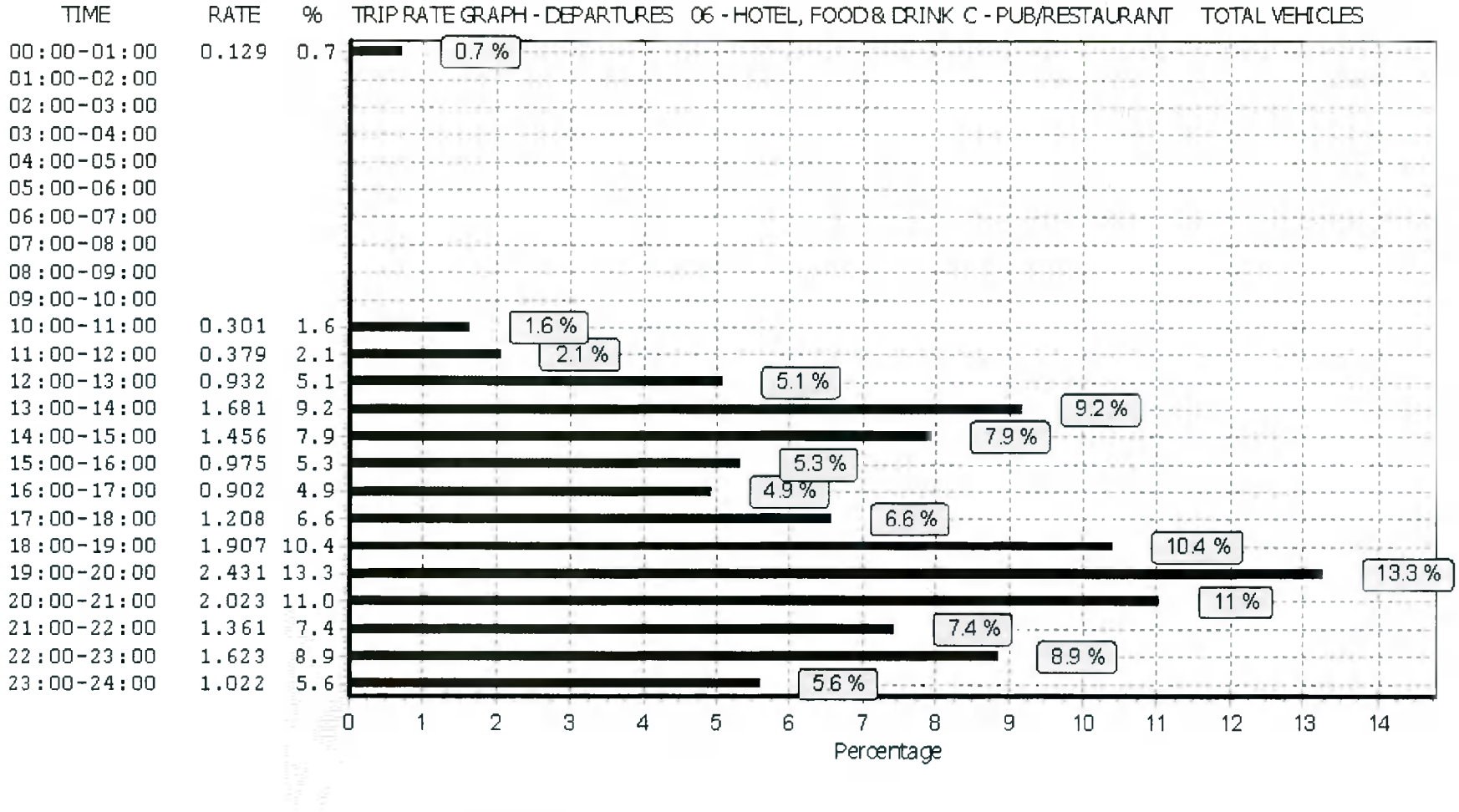
Trip rate parameter range selected:	200 - 1550 (units: sqm)
Survey date date range:	01/01/13 - 23/11/19
Number of weekdays (Monday-Friday):	22
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

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.

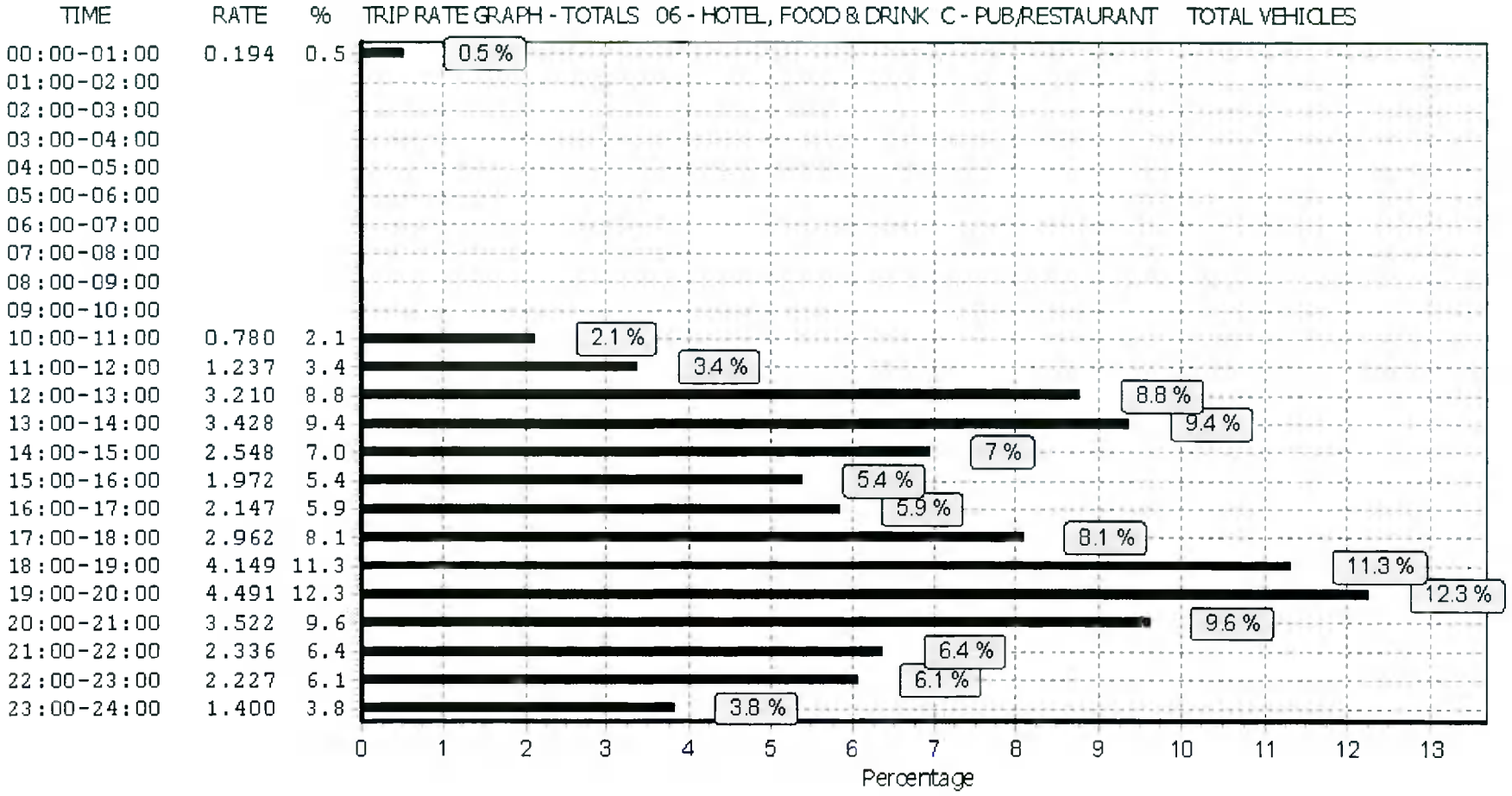
TIME	RATE	%
00:00-01:00	0.065	0.4
01:00-02:00		
02:00-03:00		
03:00-04:00		
04:00-05:00		
05:00-06:00		
06:00-07:00		
07:00-08:00		
08:00-09:00		
09:00-10:00		
10:00-11:00	0.479	2.6
11:00-12:00	0.858	4.7
12:00-13:00	2.278	12.5
13:00-14:00	1.747	9.6
14:00-15:00	1.092	6.0
15:00-16:00	0.997	5.5
16:00-17:00	1.245	6.8
17:00-18:00	1.754	9.6
18:00-19:00	2.242	12.3
19:00-20:00	2.060	11.3
20:00-21:00	1.499	8.2
21:00-22:00	0.975	5.3
22:00-23:00	0.604	3.3
23:00-24:00	0.378	2.1



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.

Calculation Reference: AUDIT-160301-210428-0415

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 01 - RETAIL
Category : I - SHOPPING CENTRE - LOCAL SHOPS
TOTAL VEHICLES

Selected regions and areas:

03	**SOUTH WEST**		
	BR	BRISTOL CITY	1 days
05	**EAST MIDLANDS**		
	LE	LEICESTERSHIRE	1 days
06	**WEST MIDLANDS**		
	SH	SHROPSHIRE	1 days
	WM	WEST MIDLANDS	1 days
	WO	WORCESTERSHIRE	1 days
09	**NORTH**		
	TV	TEES VALLEY	2 days
	TW	TYNE & WEAR	1 days
11	**SCOTLAND**		
	SR	STIRLING	1 days
13	**MUNSTER**		
	CR	CORK	1 days
15	**GREATER DUBLIN**		
	DL	DUBLIN	1 days
16	**ULSTER (REPUBLIC OF IRELAND)**		
	DN	DONEGAL	1 days

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

TRIP RATE for Land Use 01 - RETAIL/I - SHOPPING CENTRE - LOCAL SHOPS

TOTAL VEHICLES

Calculation factor: 100 sqm

BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	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	12	1533	2.495	12	1533	2.310	12	1533	4.805
08:00 - 09:00	12	1533	2.929	12	1533	2.625	12	1533	5.554
09:00 - 10:00	12	1533	3.620	12	1533	3.125	12	1533	6.745
10:00 - 11:00	12	1533	3.641	12	1533	3.446	12	1533	7.087
11:00 - 12:00	12	1533	3.880	12	1533	3.870	12	1533	7.750
12:00 - 13:00	**12**	**1533**	**4.761**	**12**	**1533**	**4.571**	**12**	**1533**	**9.332**
13:00 - 14:00	12	1533	4.130	12	1533	4.212	12	1533	8.342
14:00 - 15:00	12	1533	3.837	12	1533	3.886	12	1533	7.723
15:00 - 16:00	12	1533	3.652	12	1533	3.880	12	1533	7.532
16:00 - 17:00	12	1533	3.940	12	1533	3.783	12	1533	7.723
17:00 - 18:00	12	1533	3.957	12	1533	4.201	12	1533	8.158
18:00 - 19:00	12	1533	3.826	12	1533	4.065	12	1533	7.891
19:00 - 20:00	11	1364	4.345	11	1364	4.392	11	1364	8.737
20:00 - 21:00	11	1364	3.065	11	1364	3.265	11	1364	6.330
21:00 - 22:00	10	1095	2.748	10	1095	3.213	10	1095	5.961
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			54.826			54.844			109.670

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.

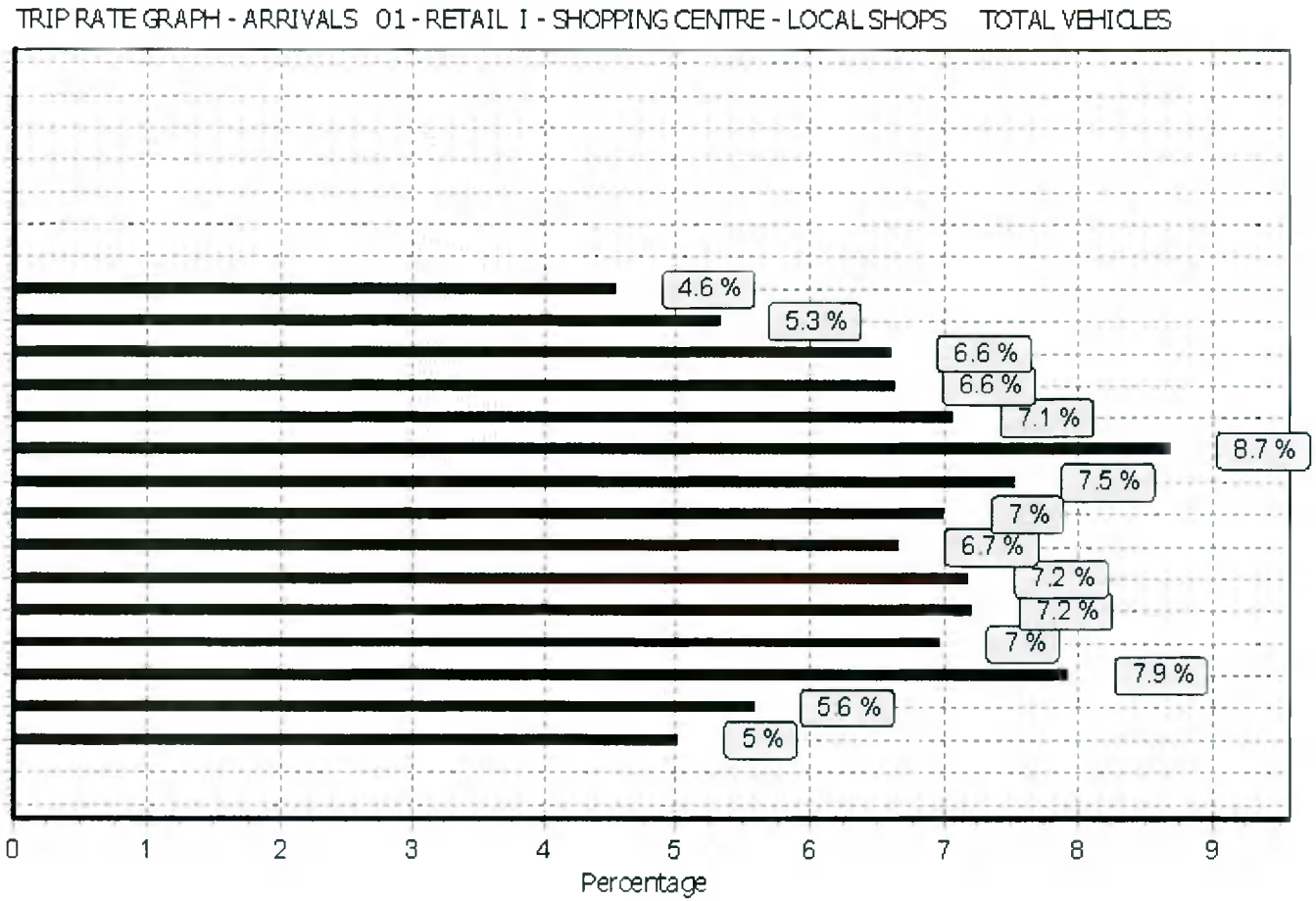
*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected 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:	450 - 4052 (units: sqm)
Survey date date range:	01/01/13 - 24/05/19
Number of weekdays (Monday-Friday):	12
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

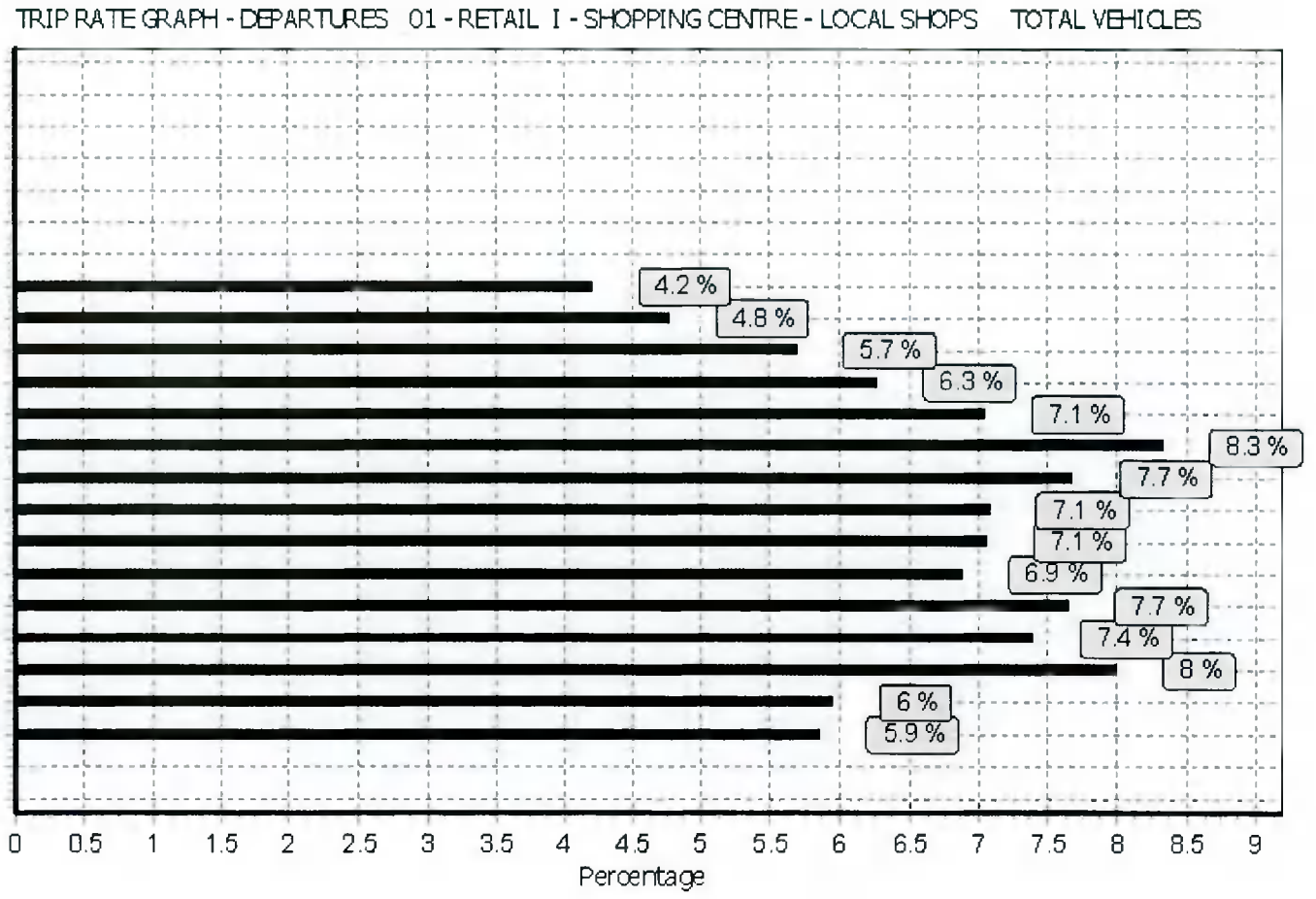
This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected 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.

TIME	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	2.495	4.6
08:00-09:00	2.929	5.3
09:00-10:00	3.620	6.6
10:00-11:00	3.641	6.6
11:00-12:00	3.880	7.1
12:00-13:00	4.761	8.7
13:00-14:00	4.130	7.5
14:00-15:00	3.837	7.0
15:00-16:00	3.652	6.7
16:00-17:00	3.940	7.2
17:00-18:00	3.957	7.2
18:00-19:00	3.826	7.0
19:00-20:00	4.345	7.9
20:00-21:00	3.065	5.6
21:00-22:00	2.748	5.0
22:00-23:00		
23:00-24:00		



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.

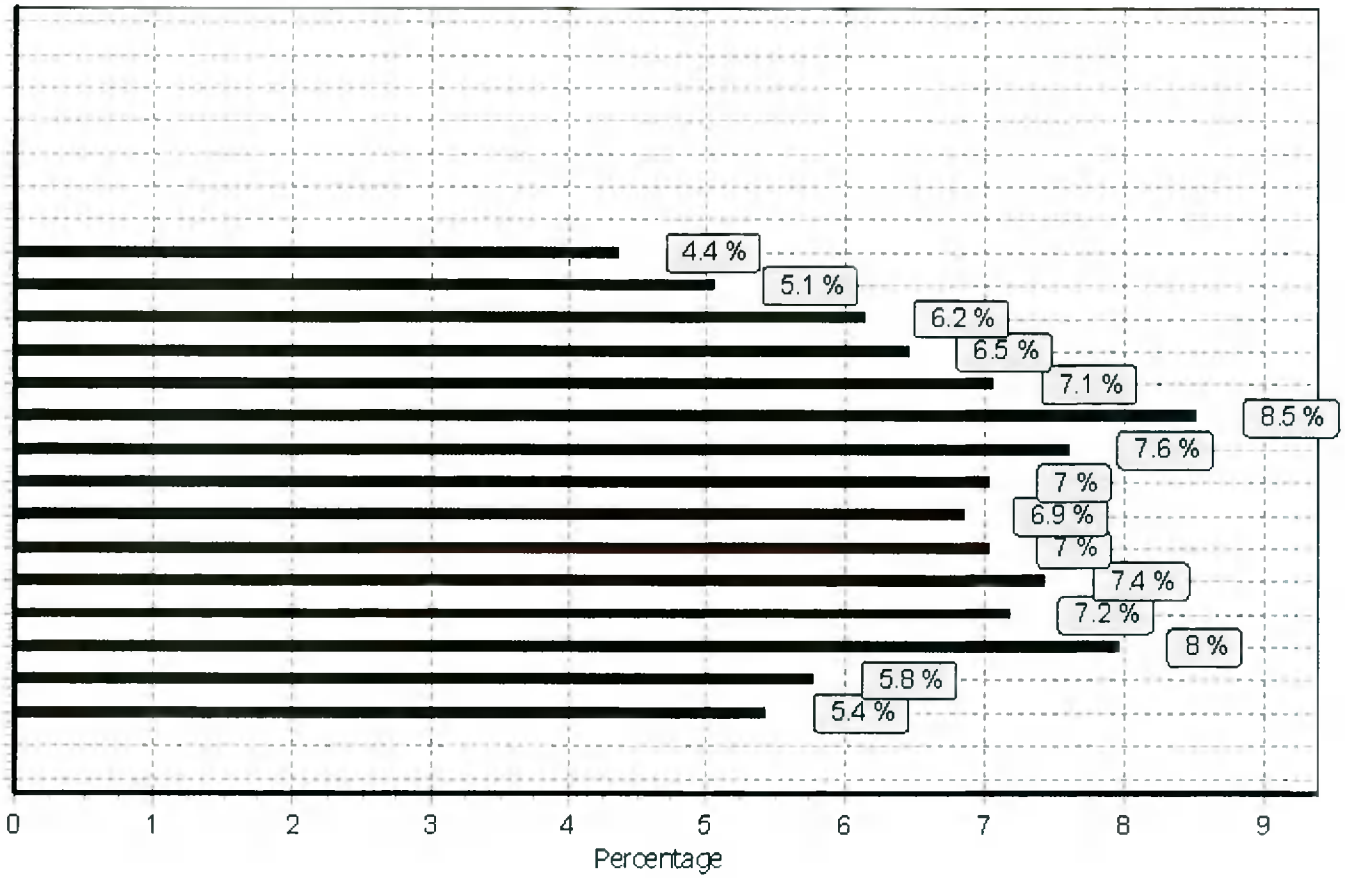
TIME	RATE	%
00:00-01:00		
01:00-02:00		
02:00-03:00		
03:00-04:00		
04:00-05:00		
05:00-06:00		
06:00-07:00		
07:00-08:00	2.310	4.2
08:00-09:00	2.625	4.8
09:00-10:00	3.125	5.7
10:00-11:00	3.446	6.3
11:00-12:00	3.870	7.1
12:00-13:00	4.571	8.3
13:00-14:00	4.212	7.7
14:00-15:00	3.886	7.1
15:00-16:00	3.880	7.1
16:00-17:00	3.783	6.9
17:00-18:00	4.201	7.7
18:00-19:00	4.065	7.4
19:00-20:00	4.392	8.0
20:00-21:00	3.265	6.0
21:00-22:00	3.213	5.9
22:00-23:00		
23:00-24:00		



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.

TRIP RATE GRAPH - TOTALS 01 - RETAIL I - SHOPPING CENTRE - LOCAL SHOPS TOTAL VEHICLES

TIME	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	4.805	4.4
08:00-09:00	5.554	5.1
09:00-10:00	6.745	6.2
10:00-11:00	7.087	6.5
11:00-12:00	7.750	7.1
12:00-13:00	9.332	8.5
13:00-14:00	8.342	7.6
14:00-15:00	7.723	7.0
15:00-16:00	7.532	6.9
16:00-17:00	7.723	7.0
17:00-18:00	8.158	7.4
18:00-19:00	7.891	7.2
19:00-20:00	8.737	8.0
20:00-21:00	6.330	5.8
21:00-22:00	5.961	5.4
22:00-23:00		
23:00-24:00		



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.

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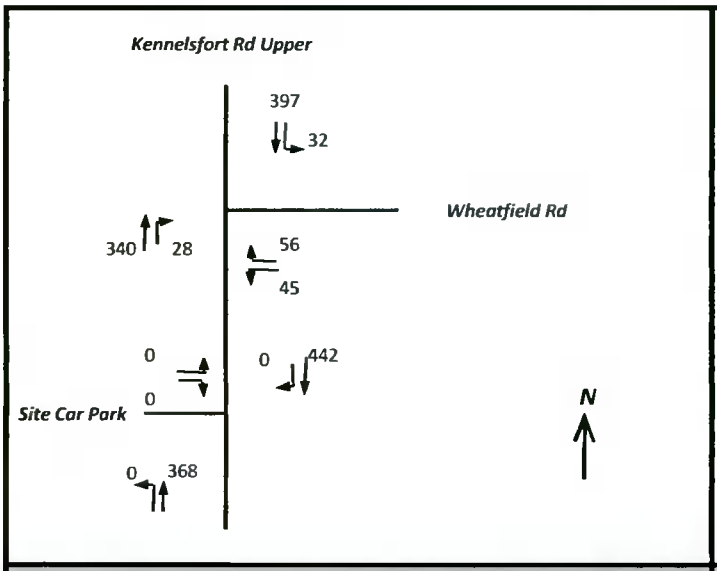
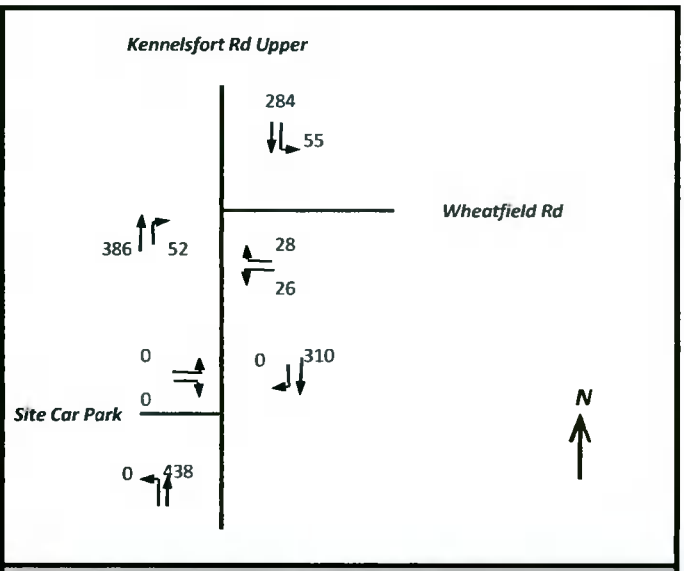
APPENDIX C

Traffic Surveys, Trip Distribution & Network Traffic Flow Diagrams

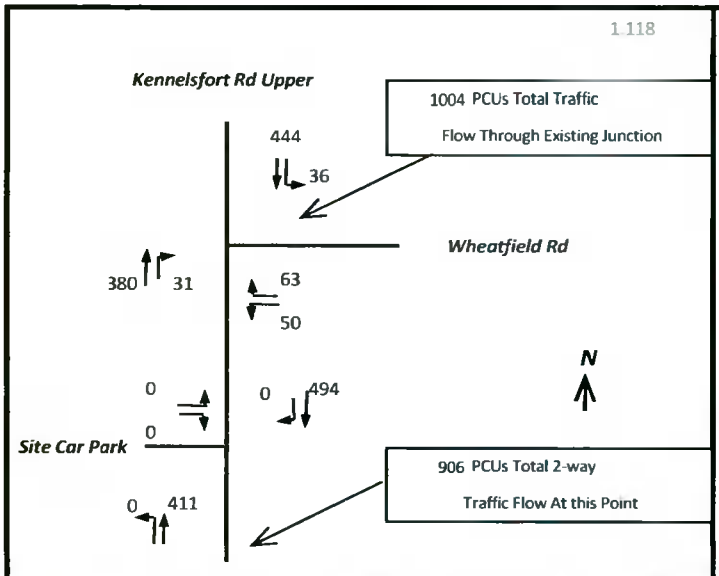


BASE Traffic Flow Local Network
AM Peak Hour 0800-0900H - As Extracted
Without Development (PCUs)

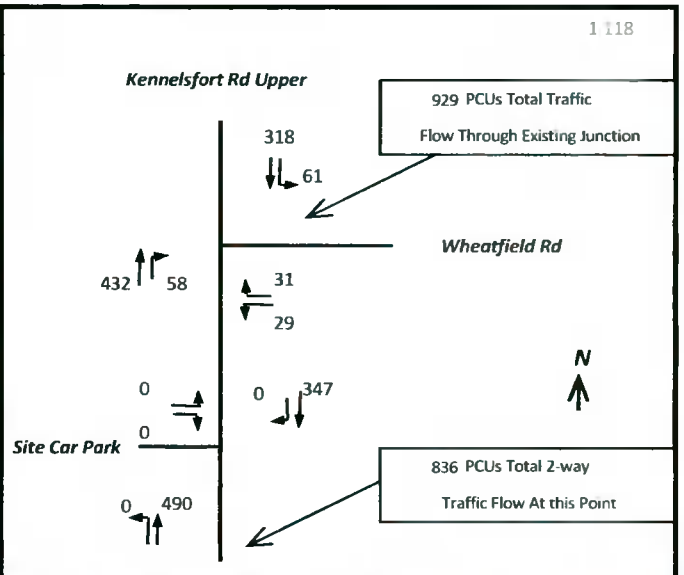


BASE Traffic Flow Local Network
PM Peak Hour 5-6pm - As Extracted
Without Development (PCUs)

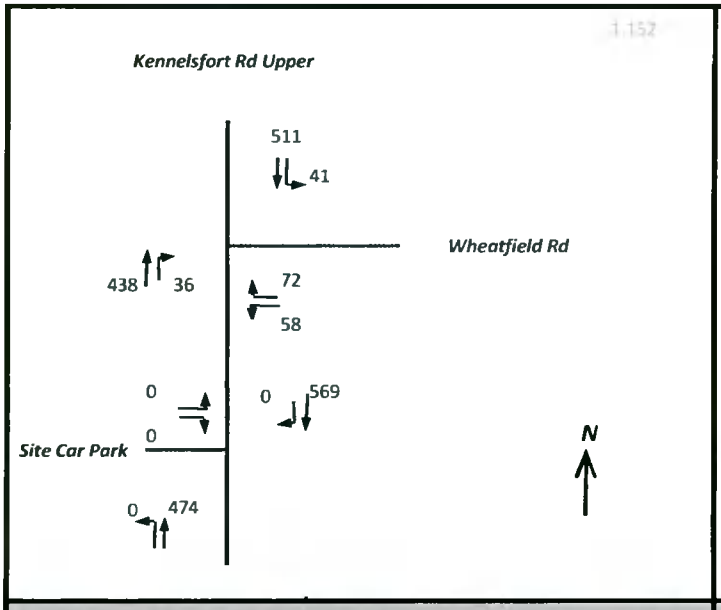
TII PE-PAG-02017 Project Appraisal Guidelines for National Roads Unit 5.3 (Travel Demand Projections 2019, Table 6.1: Central Growth Rates: Annual Growth Factors Metropolitan Dublin)	*Survey to 2024 = 1.118*
	2024 to 2039 = 1.152



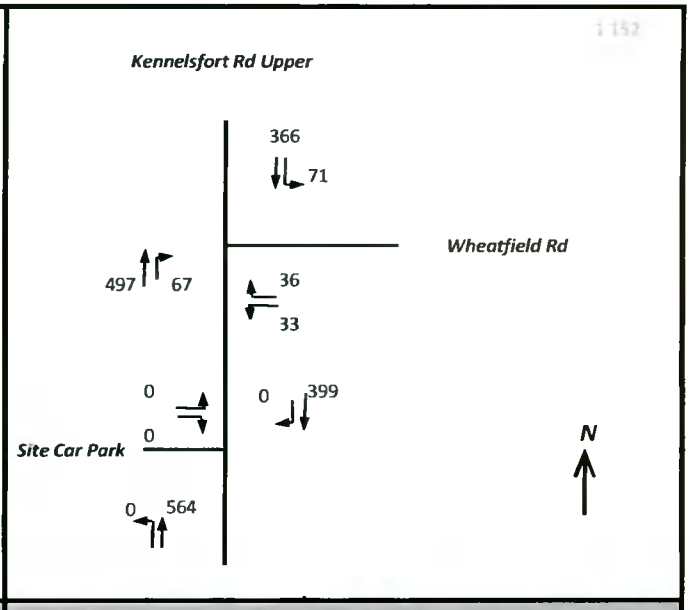
2024 OPENING YEAR Traffic Flow Local Network
AM Peak Hour 0800-0900H
Without Development (PCUs)



2024 OPENING YEAR Traffic Flow Local Network
PM Peak Hour 5-6pm
Without Development (PCUs)



2039 DESIGN YEAR (Ope +15) Traffic Flow Local Network
AM Peak Hour 8-9am
Without Development (PCUs)



2039 DESIGN YEAR (Ope +15) Traffic Flow Local Network
PM Peak Hour 5-6pm
Without Development (PCUs)

Table 1- Traffic Generated by 50 Apartments

50 Apartments	Arrivals (PCUs)		Departures (PCUs)		Total 2-Way Traffic Generated
Network Hour	Per Unit	50 Units	Per Unit	50 Units	
Weekday AM Peak Hr	0.062	3	0.203	10	13
Weekday PM Peak Hr	0.178	9	0.088	4	13

Table 2 - Traffic Generated by Pub/Restaurant

560 m2 Pub/Restaurant	Arrivals (PCUs)		Departures (PCUs)		Total 2-Way Traffic Generated
Network Hour	Per 100m2	Development	Per 100m2	Development	
Weekday AM Peak Hr	0.000	0	0.000	0	0
Weekday PM Peak Hr	1.754	10	1.208	7	17

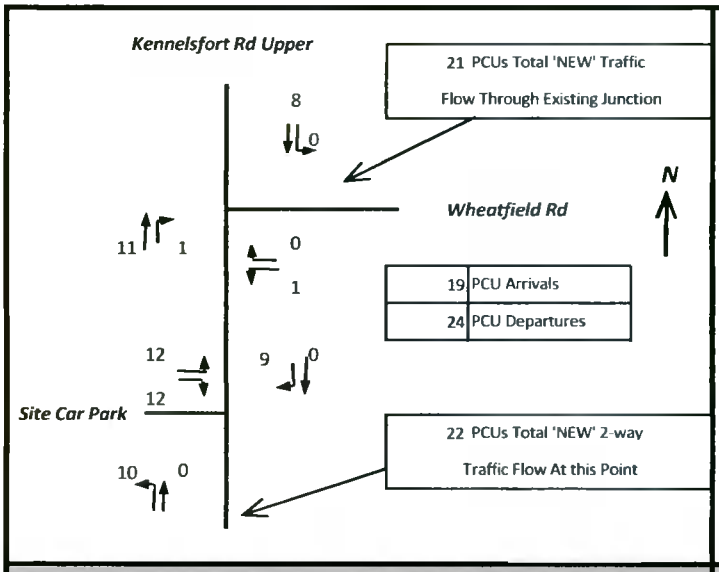
Table 3 - Traffic Generated by Remaining Local Shop Uses

533 m2 Local Shop Uses	Arrivals (PCUs)		Departures (PCUs)		Total 2-Way Traffic Generated
Network Hour	Per 100m2	Development	Per 100m2	Development	
Weekday AM Peak Hr	2.929	16	2.625	14	30
Weekday PM Peak Hr	3.957	21	4.201	22	43

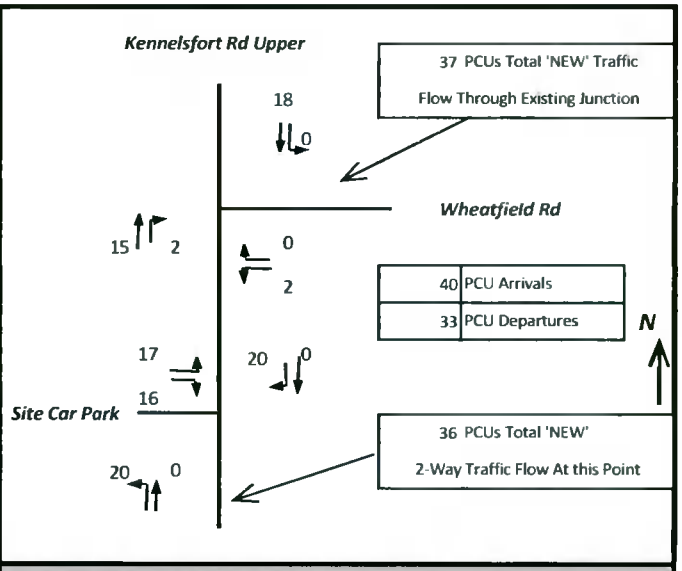
NB - We have made no 'discount' for the Current Uses of the Site, Which Strictly Speaking we are entitled to do in terms of the TTA Guidelines - therefore the assessment is Further Robust.

TABLE 4 - TOTAL DEVELOPMENT TRAFFIC GENERATION (PCUs)

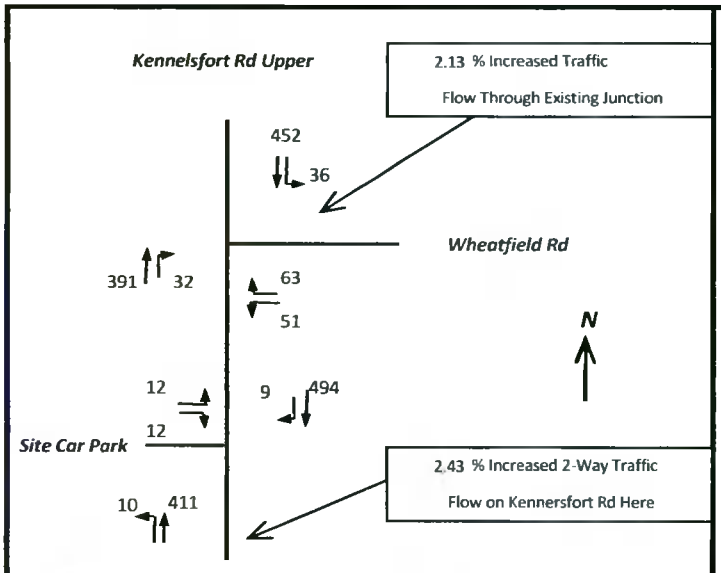
Network Hour	Arrivals (PCUs)	Departures (PCUs)
Weekday AM Peak Hr	19	24
Weekday PM Peak Hr	40	33



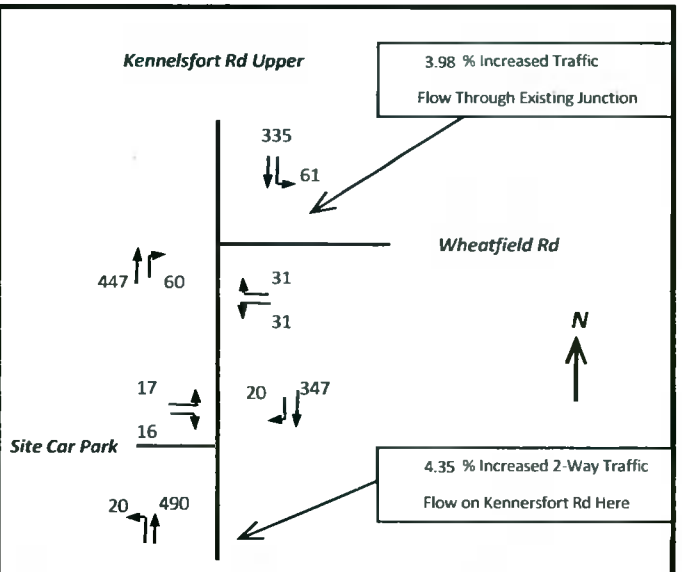
Assignment of Subject Development Traffic Flows based On TRICS, with Flows Distributed in Accordance with Established Traffic Patterns on the adjacent Road Network (Weekday AM PEAK HOUR 8-9am)



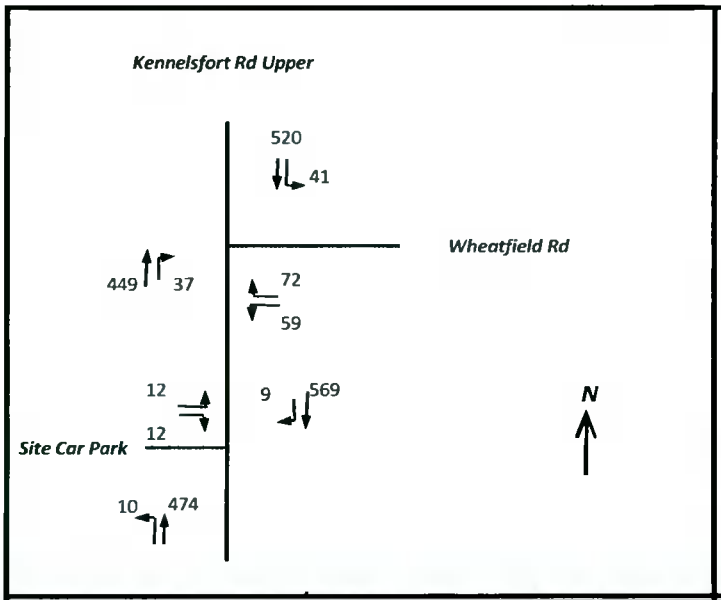
Assignment of Subject Development Traffic Flows based On TRICS, with Flows Distributed in Accordance with Established Traffic Patterns on the adjacent Road Network (Weekday PM PEAK HOUR 5-6pm)



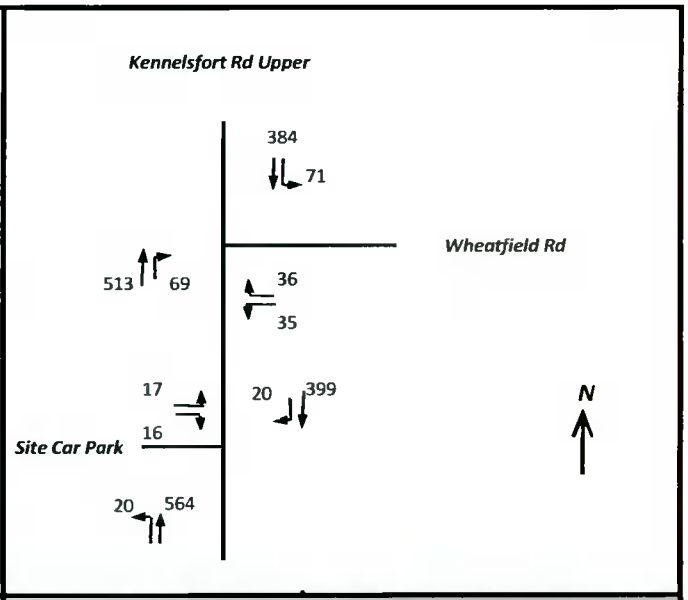
PROJECTED Traffic Flow Local Network AM Peak Hour 0800-0900H 2024 Opening Yr WITH Development Completed AND Occupied (PCUs)



PROJECTED Traffic Flow Local Network PM Peak Hour 1700-1800H 2024 Opening Yr WITH Development Completed AND Occupied (PCUs)



PROJECTED Traffic Flow Local Network
AM Peak Hour 0800-0900H 2039 Design Yr
WITH Development Completed AND Occupied (PCUs)



PROJECTED Traffic Flow Local Network
PM Peak Hour 1700-1800H 2039 Design Yr
WITH Development Completed AND Occupied (PCUs)

NRB consulting engineers

APPENDIX D

JUNCTION9 - PICADY
Simulation Capacity Model Output
Kennelsfort Rd Upper Site Access T-Junction

Kennelsfort rd Upper/Car Park Access T-Junction
Summary PICADY Results in Order as included herein

Modelled Scenario	Period Mean Max Q (PCUs)	Period Max RFC
2024 Opening Year AM Peak	<1	0.06
2024 Opening Year PM Peak	<1	0.09
2039 Design Year AM Peak	<1	0.07
2039 Design Year PM Peak	<1	0.09

All Results Above are way below the recommended RFC of 0.85 (85% Capacity) and therefore no problems whatsoever are anticipated at the Junction in terms of Capacity or excessive vehicle Queues

NB Any Small Changes to Selected Opening Year 2024 or Design Year 2039, or indeed significantly higher traffic volumes experienced, will clearly have no significant implications in terms of the conclusions of the Study.

Junctions 9

PICADY 9 - Priority Intersection Module

Filename: 2024 AM PM.j9
Path: C:\Users\Eoin\NRB Consulting Engineers Ltd\NRB Server - Documents\2021\21-022 Silver Granite\Calculations\Access Picadys
Report generation date: 28/04/2021 16:05:30

Summary of junction performance

	AM				PM			
	Q (PCU)	Delay (s)	RFC	LOS	Q (PCU)	Delay (s)	RFC	LOS
	2024							
Stream B-AC	0.1	8.89	0.06	A	0.1	9.24	0.09	A
Stream C-AB	0.0	6.97	0.02	A	0.0	7.39	0.04	A

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

File summary

File Description

Title	(untitled)
Location	
Site number	
Date	28/04/2021
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	NRB-004\Eoin
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Av. delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin

Analysis Options

Calculate Q Percentiles	Calculate residual capacity	RFC Threshold	Av. Delay threshold (s)	Q threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2024	AM	ONE HOUR	07:45	09:15	15
D2	2024	PM	ONE HOUR	16:45	18:15	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

2024, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Car Park Access K'Frt Rd	T-Junction	Two-way	0.29	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	K'Frt Rd Upper S		Major
B	Car Park		Minor
C	K'Frt Rd N		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	6.50			90.0	✓	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 (m)	Visibility to left (m)	Visibility to right (m)
B	One lane	3.00	90	90

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	552	0.098	0.249	0.156	0.355
1	B-C	681	0.102	0.258	-	-
1	C-B	626	0.237	0.237	-	-

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

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	2024	AM	ONE HOUR	07:45	09:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
A		✓	421	100.000
B		✓	24	100.000
C		✓	503	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	10	411
	B	12	0	12
	C	494	9	0

Vehicle Mix

HV %s

		To		
		A	B	C
From	A	0	0	1
	B	0	0	0
	C	1	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Q (PCU)	Max LOS
B-AC	0.06	8.89	0.1	A
C-AB	0.02	6.97	0.0	A
C-A				
A-B				
A-C				

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	18	490	0.037	18	0.0	7.626	A
C-AB	7	555	0.012	7	0.0	6.561	A
C-A	372			372			
A-B	8			8			
A-C	309			309			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	22	466	0.046	22	0.0	8.106	A
C-AB	8	543	0.015	8	0.0	6.731	A
C-A	444			444			
A-B	9			9			
A-C	369			369			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	26	432	0.061	26	0.1	8.884	A
C-AB	10	527	0.019	10	0.0	6.971	A
C-A	544			544			
A-B	11			11			
A-C	453			453			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	26	432	0.061	26	0.1	8.886	A
C-AB	10	527	0.019	10	0.0	6.971	A
C-A	544			544			
A-B	11			11			
A-C	453			453			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	22	466	0.046	22	0.0	8.110	A
C-AB	8	543	0.015	8	0.0	6.732	A
C-A	444			444			
A-B	9			9			
A-C	369			369			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	18	490	0.037	18	0.0	7.633	A
C-AB	7	555	0.012	7	0.0	6.564	A
C-A	372			372			
A-B	8			8			
A-C	309			309			

2024, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Car Park Access K'Frt Rd	T-Junction	Two-way	0.50	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2024	PM	ONE HOUR	16:45	18:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
A		✓	510	100.000
B		✓	33	100.000
C		✓	367	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	20	490
	B	16	0	17
	C	347	20	0

Vehicle Mix

HV %s

		To		
		A	B	C
From	A	0	0	1
	B	0	0	0
	C	1	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Q (PCU)	Max LOS
B-AC	0.09	9.24	0.1	A
C-AB	0.04	7.39	0.0	A
C-A				
A-B				
A-C				

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	25	486	0.051	25	0.1	7.797	A
C-AB	15	542	0.028	15	0.0	6.827	A
C-A	261			261			
A-B	15			15			
A-C	369			369			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	30	461	0.064	30	0.1	8.342	A
C-AB	18	528	0.035	18	0.0	7.062	A
C-A	312			312			
A-B	18			18			
A-C	440			440			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	36	426	0.085	36	0.1	9.236	A
C-AB	23	510	0.045	23	0.0	7.391	A
C-A	381			381			
A-B	22			22			
A-C	540			540			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	36	426	0.085	36	0.1	9.240	A
C-AB	23	510	0.045	23	0.0	7.394	A
C-A	381			381			
A-B	22			22			
A-C	540			540			

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	30	461	0.064	30	0.1	8.348	A
C-AB	18	528	0.035	18	0.0	7.066	A
C-A	312			312			
A-B	18			18			
A-C	440			440			

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	25	486	0.051	25	0.1	7.806	A
C-AB	15	542	0.028	15	0.0	6.833	A
C-A	261			261			
A-B	15			15			
A-C	369			369			

Junctions 9

PICADY 9 - Priority Intersection Module

Filename: 2039 AM PM.j9
Path: C:\Users\Eoin\NRB Consulting Engineers Ltd\NRB Server - Documents\2021\21-022 Silver Granite\Calculations\Access Picadys
Report generation date: 28/04/2021 16:08:14

Summary of junction performance

	AM				PM			
	Q (PCU)	Delay (s)	RFC	LOS	Q (PCU)	Delay (s)	RFC	LOS
	2039							
Stream B-AC	0.1	9.56	0.07	A	0.1	9.96	0.09	A
Stream C-AB	0.0	7.17	0.02	A	0.1	7.65	0.05	A

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

File summary

File Description

Title	(untitled)
Location	
Site number	
Date	28/04/2021
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	NRB-004\Eoin
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Av. delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin

Analysis Options

Calculate Q Percentiles	Calculate residual capacity	RFC Threshold	Av. Delay threshold (s)	Q threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

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	07:45	09:15	15
D2	2039	PM	ONE HOUR	16:45	18:15	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

2039, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Car Park Access K'Frt Rd	T-Junction	Two-way	0.27	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	K'Frt Rd Upper S		Major
B	Car Park		Minor
C	K'Frt Rd N		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	6.50			90.0	✓	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 (m)	Visibility to left (m)	Visibility to right (m)
B	One lane	3.00	90	90

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	552	0.098	0.249	0.156	0.355
1	B-C	681	0.102	0.258	-	-
1	C-B	626	0.237	0.237	-	-

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

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	07:45	09:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
A		✓	484	100.000
B		✓	24	100.000
C		✓	578	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	10	474
	B	12	0	12
	C	569	9	0

Vehicle Mix

HV %s

		To		
		A	B	C
From	A	0	0	1
	B	0	0	0
	C	1	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Q (PCU)	Max LOS
B-AC	0.07	9.56	0.1	A
C-AB	0.02	7.17	0.0	A
C-A				
A-B				
A-C				

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	18	471	0.038	18	0.0	7.939	A
C-AB	7	545	0.013	7	0.0	6.689	A
C-A	428			428			
A-B	8			8			
A-C	357			357			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	22	443	0.049	22	0.1	8.540	A
C-AB	8	531	0.015	8	0.0	6.889	A
C-A	511			511			
A-B	9			9			
A-C	426			426			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	26	403	0.066	26	0.1	9.554	A
C-AB	10	512	0.020	10	0.0	7.173	A
C-A	626			626			
A-B	11			11			
A-C	522			522			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	26	403	0.066	26	0.1	9.559	A
C-AB	10	512	0.020	10	0.0	7.173	A
C-A	626			626			
A-B	11			11			
A-C	522			522			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	22	443	0.049	22	0.1	8.546	A
C-AB	8	531	0.015	8	0.0	6.892	A
C-A	511			511			
A-B	9			9			
A-C	426			426			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	18	471	0.038	18	0.0	7.947	A
C-AB	7	545	0.013	7	0.0	6.689	A
C-A	428			428			
A-B	8			8			
A-C	357			357			

2039, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Car Park Access K'Frt Rd	T-Junction	Two-way	0.47	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2039	PM	ONE HOUR	16:45	18:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
A		✓	584	100.000
B		✓	33	100.000
C		✓	419	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	20	564
	B	16	0	17
	C	399	20	0

Vehicle Mix

HV %s

		To		
		A	B	C
From	A	0	0	1
	B	0	0	0
	C	1	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Q (PCU)	Max LOS
B-AC	0.09	9.96	0.1	A
C-AB	0.05	7.65	0.1	A
C-A				
A-B				
A-C				

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	25	468	0.053	25	0.1	8.124	A
C-AB	15	530	0.029	15	0.0	6.986	A
C-A	300			300			
A-B	15			15			
A-C	425			425			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	30	439	0.068	30	0.1	8.802	A
C-AB	18	514	0.036	18	0.0	7.260	A
C-A	358			358			
A-B	18			18			
A-C	507			507			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	36	398	0.091	36	0.1	9.954	A
C-AB	23	494	0.047	23	0.1	7.646	A
C-A	438			438			
A-B	22			22			
A-C	621			621			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	36	398	0.091	36	0.1	9.960	A
C-AB	23	494	0.047	23	0.1	7.646	A
C-A	438			438			
A-B	22			22			
A-C	621			621			

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	30	439	0.068	30	0.1	8.809	A
C-AB	18	514	0.036	18	0.0	7.261	A
C-A	358			358			
A-B	18			18			
A-C	507			507			

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	25	467	0.053	25	0.1	8.137	A
C-AB	15	530	0.029	15	0.0	6.992	A
C-A	300			300			
A-B	15			15			
A-C	425			425			

NRB consulting engineers

APPENDIX E

Preliminary Development Mobility Management Plan

NRB consulting engineers

Preliminary Travel Plan

(Mobility Management Plan)

Appendix E

For

Proposed
Mixed/Residential
Development

At

Silver Granite Pub Site,
Palmerstown, Dublin 20

SUBMISSION ISSUE

1st Floor, Apollo Building, Dundrum Rd., Dundrum, Dublin 14
Tel: +353 1 292 1941, E-mail: info@nrb.ie, Web: www.nrb.ie

Registered in Ireland No. 491679

Contents

1.0 INTRODUCTION

1.1 NRB Consulting Engineers have been commissioned to prepare a Preliminary Travel Plan (or Mobility Management Plan) in support of a proposed development on the site of the Silver Granite Pub, Palmerstown, Dublin 20.

1.2 The proposed development consists of 50 No Apartments and a replacement Pub/Restaurant together with some small local shop uses at ground floor level. This report concentrates primarily on the Residential elements of the permitted development and the staff in the commercial elements.

1.3 This report has been prepared to explain the developments commitment to the promotion of more sustainable and cost-effective travel habits among the end occupiers/residents of the scheme. This Report provides a structure for the Management Company and the appointed Travel Plan Co-Ordinator to follow from occupation. However, it should be noted that an MMP prepared at Planning Stage can only assist in identifying the alternative transport modes available to the site and set out the principles that are to follow on from occupation.

What is a Travel Plan?

1.4 Travel Plans, originally and elsewhere called Mobility Management Plans (MMPs), they originated in the United States and the Netherlands in the late 1980s. In the US, employers over a certain size (generally over 100 employees) were required to implement 'Trip Reduction Plans' in order to reduce single-occupancy car commuting trips, and to increase car occupancy.

1.5 A MMP or Travel Plan (TP) consists of a package of measures put in place to encourage and support more sustainable travel patterns Such a plan usually concentrates on work and school commuting patterns. In essence, a TP is useful not only to reduce the attractiveness of private car use, but also for the ability to promote and support the use of more sustainable transport modes such as walking, cycling, shared transport and mass transit such as buses and trains.

Aims and Objectives of this Travel Plan

1.6 The package generally includes measures to promote and improve the attractiveness of using public transport, cycling, walking, car sharing, flexible working or a combination of these as alternatives to single-occupancy car journeys to work. A TP can consider all travel associated with the residential or work site, including business travel, fleet management, customer access and deliveries. It should be considered as a dynamic process where a package of measures and campaigns are identified, piloted and monitored on an on-going basis. This TP supports the slightly reduced managed provision of car parking and higher cycle parking space numbers at the subject development.

1.7 The changes which are being sought as part of any plan may be as simple as car sharing one-day per week, or walking on Wednesdays, or taking the bus on days which do not conflict with other commitments, leisure or work activities.

1.8 It is envisaged that, once in place, the Travel Plan will enable the following benefits to be realised for the Development:

- 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 vehicles,
- Improved safety for cyclists and pedestrians,
- Direct financial savings for those taking part in the developed initiatives, through higher-than-average vehicle occupancy rates,
- A reduction in car parking and car set-down demand, resulting in improved operational efficiency and safety for all,
- Improved social networking between all those participating in the shared initiatives,
- Improved environmental consideration and performance,
- Improved public image for the development, which sets an example to the broader community and may lead to residents and visitors making better travel decisions in the future,
- Improved health and well-being for those using active non-car transport modes,
- Regular liaison with the Local Authority and public transport providers to maintain, improve, and support transportation services to and from the site,
- Improved attractiveness of the development to prospective residents,
- Optimal levels of safety for all residents and visitors.

Methodology

1.9 As part of this Travel Plan, reference has been made to the following documents:

- Your Step By Step Guide To Travel Plans (NTA 2012);
- Achieving Effective Workplace Travel Plans (NTA 2011);
- Traffic and Transport Assessment Guidelines (TII);
- Traffic Management Guidelines (DoELG, 2003);
- Mobility Management Plans – DTO Advice Note (DTO, 2002);
- The Route to Sustainable Commuting (DTO 2001);
- Smarter Travel: A Sustainable Transport Future (DOT)

1.10 Consultation with key stakeholders is an essential part of any Travel plan. As discussed below, as part of the operational phase of this development, a Travel Plan Coordinator Role will be appointed from within the Management Company. Following on, **once occupied**, Residents and staff of the commercial elements will be asked to complete detailed questionnaires on essential data in relation to their existing travel patterns. This information will be used to inform the ongoing implementation, monitoring and review of the plan for this development.

1.11 This information has been used herein as the basis for the assessment, conclusions and recommendations.

2.0 ACCESS TO THE SITE - BY MODE

2.1 The proposed development consists of a 50 unit apartment scheme at upper levels, with ground floor retail & pub/restaurant uses, together with bicycle and car carking. The scheme provides for secure off street parking areas for bicycles and a restricted number of private car parking spaces within the established car park opposite the site on Kennelsfort Road Upper, along with all associated site works.

2.2 The scheme in effect reduces the number of car parking spaces within the City by redeveloping the existing Pub Car Parking area, in the immediate confines of the existing building, which is an effective demand management measure in itself. This therefore represents best practice sustainable development – refer to ***Figure 2.1*** below

Figure 2.1 – Silver Granite - Extents being Redeveloped

2.3 It is essential for the successful Travel Planning to concentrate on journeys generally associated with work and school commuting patterns. These are the groups which can most practically be encouraged to use modes of transport other than the car.

Cycling and Walking Facilities

2.4 At present, pedestrian/cycle traffic at/to the existing site is served by an extensive network of footpaths and lanes/facilities including cycle lanes within bus lanes which facilitate cyclists, some of which are in a shared arrangement. These facilities are proposed to be upgraded and expanded as part of the Bus Connects proposals running within easy access to the subject site.

2.5 An extract from the Core Bus Connects Project Brochure showing the site in context is included below as ***Figure 2.2***.

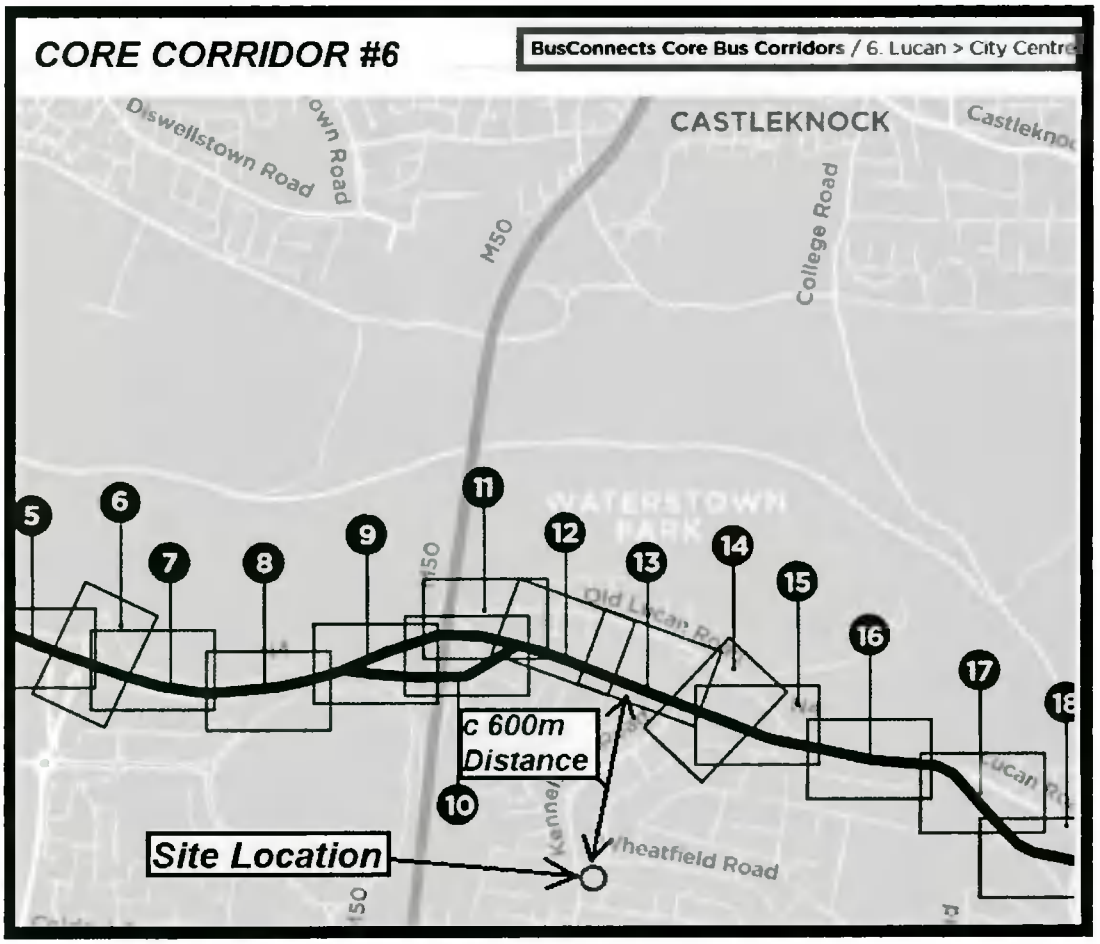


Figure 2.2 – Core Corridor #6 Lucan to City & Site

2.6 The site is within a short walk of schools, shops, doctors' surgery, pharmacy, shops, restaurants & public houses amongst other local services which can serve residents of the development for their regular shopping/service's needs. Indeed, the site is directly across the road from Moriartys Supervalu. There are also major employment destinations in very close proximity to the site (for example Cherry Orchard Industrial Estate and Liffey Valley).

2.7 The key to cycle accessibility is convenient safe links, with secure and carefully sited cycle parking. Cycling is ideal for shorter journeys. The SDCC Development Plan sets out the car parking and cycle parking requirements for developments, based on their location and the accessibility to public transport.

2.8 The National Transport Authority (NTA) has surveyed the cycle facilities for the Greater Dublin Area (GDA) as part of the GDA Cycle Network Plan. This plan showing the facilities linking the site with the overall GDA. An extract is provided below as ***Figure 2.3*** showing the good network of cycle links connecting the site with the GDA Network.

Figure 2.3 – GDA Cycle Network Plan Extract, Showing Site Location

2.9 For journeys greater than 8km, it is recognised that a modal shift to cycling could be achievable for some, but not all, and options such as public transport and car sharing should be considered. Journeys up to 8km could be undertaken by bicycle and journeys up to 3-4km could be undertaken by walking or cycling.

2.10 The links to the GDA Network will clearly be further enhanced Bus Connects gets developed. However, in the short term there are high quality facilities currently provided on Kennelsfort Road Upper at the site as illustrated in Figure 2.4 below

Figure 2.4 – Dedicated Cycle Lanes on Kennelsfort Road Upper at the Site

2.11 The use and viability of the local services by the end occupiers of the development will be enhanced through the encouragement of the use of bicycles and through the demand management control of the limited car parking provision.

2.12 Dockless Bicycles, known locally as 'Bleeper Bikes' have been operating in South Dublin County Council since 2017. Similar to the popular Dublin Bikes scheme, the Dockless Bikes initiative provides an accessible, short term bike rental scheme across the area which will help to encourage and facilitate a positive shift to cycling as an alternative to the private car. The basis for these schemes is that they have access to rental bikes stored on public cycle parking stands and can return them to other approved public locations for a small fee. This has an advantage over the Dublin bike scheme as it does not require dedicated docking stations to be constructed. It also avoids the frustration and queues which can occur when waiting for a bike to become available and being returned to an empty docking station.

2.13 The key to cycle accessibility is convenient safe links, with secure and carefully sited cycle parking. Cycling is ideal for shorter journeys. A significant amount of work has been carried out in the provision of facilities for Cyclists in SDCC (more that 200km of cycle facilities have been provided to date, and work is ongoing).

2.14 It is clear from ***Figure 2.3*** above that it is proposed that the site will be bounded by primary, secondary and Greenway routes within close proximity to the development site, thereby creating a high-quality network of cycle routes linking the site locally, linking Liffey Valley with Palmerstown and onwards to the City Centre.

2.15 The introduction of Toucan crossing facilities for cyclists at all Traffic Signal Controlled junctions within SDCC, a scheme which is being rolled out, will further enhance cyclist accessibility and permeability. The construction of a raised platform at the subject site, with an upgrade to full Toucan Control will contribute to this.

2.16 The location of the proposed development is ideal in terms of encouraging **walking**. The proximity to major employment destinations (for example Cherry Orchard Industrial Estate and Liffey Valley (as high Employment Locations)), to Educational Facilities and other local employment hubs means that walking combined with cycling will be an attractive alternative option for the vast majority of residents and end users at the development.

2.17 In addition, being located in the heart of an established Urban Village, and a short distance from every day services such as Liffey Valley Shopping Centre, reduces the need to travel by car and will assist in encouraging walking and cycling. The proximity to Liffey Valley is illustrated in ***Figure 2.5*** below which confirms a 19-20min walk distance to the rear of the Centre (Tesco).

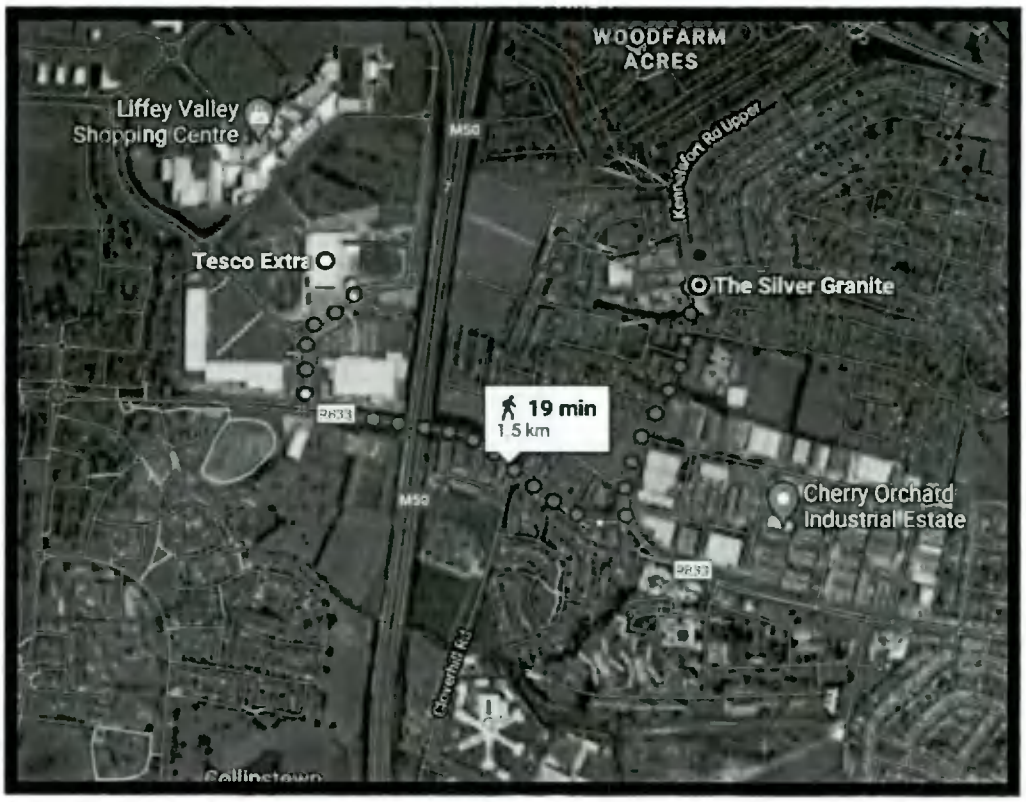


Figure 2.5 – Walking Distance to Liffey Valley

2.18 The SDCC, and national objective is to cultivate a walking and cycling culture, through the implementation of appropriate infrastructure and promotional measures, which positively encourages all members of the community to walk or cycle at all life stages and abilities, as modes of sustainable transport that delivers environmental, health and economic benefits to both the individual and the community.

2.19 In these terms we believe that walking and cycling will represent a very most popular mode of home-work-home travel for residents, staff and visitors of the development.

2.20 To help meet the target set in Ireland's first National Cycle Policy Framework launched in April 2009 (that 10% of all journeys will be by bike by 2020), the following will assist:

- Improve cycling conditions on primary cycle routes locally,
- Develop new cycle route/ greenways through parks and open spaces,
- Improve connectivity/permeability from cycle routes to key destinations,
- Provide 30kph zones within residential areas and other suitable locations,
- Provide new secure cycle parking,
- Continue cycle training in schools,
- Ensure that cycling is a key element of all development and
- Monitor trends in cycle numbers using cycle counter data

2.21 The local infrastructure plans support the 19 specific objectives in the National Cycle Policy Framework. The proposed residential development on the subject site, through good design, will assist in the promotion of cycling as a primary mode of travel.

2.22 For journeys greater than 8km, it is recognised that a modal shift to cycling could be achievable for some, but not all, and options such as public transport and car sharing should be considered. Journeys up to 8km could be undertaken by bicycle and journeys up to 3-4km could be undertaken by walking or cycling.

2.23 In terms of walking, the site is immediately adjacent Bus Stops on Kennelsfort Road Upper which are served by frequent existing Dublin Bus Services (see below ***Figure 2.6***).

Figure 2.6 – Proximity to Existing Dublin Bus Services

2.24 The residential apartment guidelines recommend a significantly higher cycle parking requirement that that contained in the SDCC Development Plan. The Guidelines recommend 1 cycle parking space per bedroom plus 1 visitor space per 2 residential units, and therefore it is proposed to provide secure cycle parking spaces along with secure surface level cycle parking within the development consistent with the Guidelines.

2.25 It is expected that a very significant number of residents will be willing to cycle to work or school, if safe links and secure parking are in place, and that is reflected in the provision of large number of dedicated cycle parking spaces over and above the SDCC's own Cycle Policy requirements and in line with new national Design Standards for Apartments.

2.26 Once occupied, advice can be provided on routes by the appointed Travel Plan Coordinator, possibly with the help of a bicycle user group. This can be further facilitated in consultation with SDCC, as the ongoing provision of cycle facilities as set out above is fully implemented. It is acknowledged that cyclists need to be confident that their cycles will not be tampered with while they are in storage. With this in mind, it is proposed to install the cycle parking with racks which allow both frame and wheels to be secured. These cycle racks are located in an active, well lit & security monitored place or where they can be seen by a security guard, either directly, or by closed circuit television.

2.27 Within the secured enclosed cycle storage areas, the arriving and departing cyclists will be required to dismount and walk to the cycle racks with their cycles in a safe manner (something which occurs without any difficulty at similar facilities in cities throughout the world).

Bus Provision

2.28 The development is well placed to take advantage of the existing and future Dublin Bus and services, with several stops currently in close proximity to the site, and with the future connectivity by way of Core Bus Connects Corridor #9 as illustrated above as ***Figure 2.3 and Figure 2.6.***

2.29 All of the Dublin Bus routes passing the development are operated using new low-floor wheelchair accessible city buses. Details of route, timetables and fares are provided on www.dublinbus.ie and on the Transport for Ireland National Journey Planner App.

2.30 The site is adjacent high frequency bus services #26 and #18 which combined have a peak hour frequency of 10-20 mis for the services combined.

2.31 In terms of number of routes and frequency of buses easily available to the residents and visitors, it is considered that the proposed development is very highly sustainable in terms of public transport accessibility. The proximity of the development to existing public transport services means that residents and visitors will have viable alternatives to the private car for accessing the site and will not be reliant upon the car as a primary mode of travel.

Accessibility By Taxi

2.32 In terms of taxis, modern communication devices (e.g. 'FreeNow' and 'Lynk') now allow taxis to be ordered on a demand-basis, without any requirement for formal taxi ranks or dedicated taxi holding areas.

Car Parking

2.33 A total of 53 Car Parking Spaces are being provided, with 32 allocated to the residential elements. For the 50 Apartments this represents a provision ratio of 0.64 per unit - which is consistent with best practice, and which is in itself an effective demand management measure.

2.34 The lower provision of car parking helps ensure that the development is occupied in the most sustainable manner with the emphasis being on non-car modes of travel.

2.35 **Car Sharing** in the form of Go-Car is becoming more popular and of course this Citywide service will be available at site. It is clear that there are also copious numbers of existing Go Car vehicles available locally (information downloaded at the time or Report Preparation and illustrated below as ***Figure 2.7***).

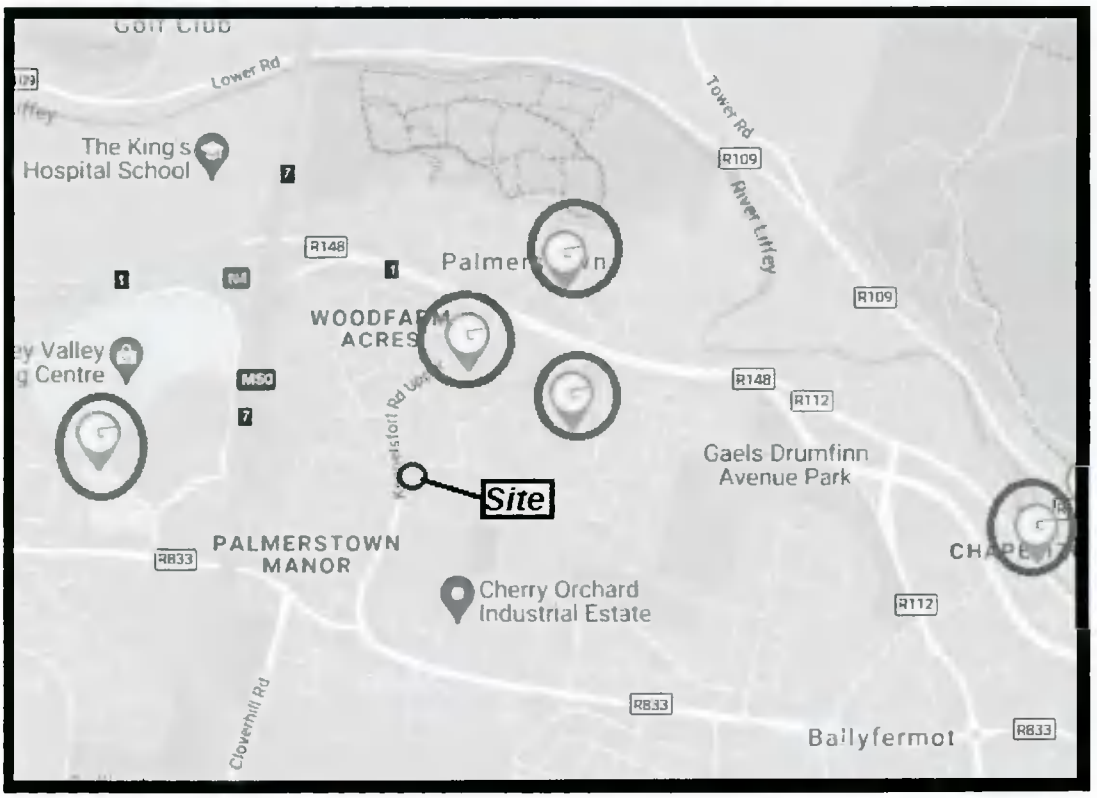


Figure 2.7 – Site & Day-to-Day Go-Car Availability (Screen Grab, Go Car)

Communication

2.36 Prior to moving in, the Management Company will issue welcome packs to all new Staff and Residents. These packs include details of the development and how it is run, advice on moving in, public transport information, useful local information, the reduced availability of parking and can require confirmation of a timeslot to move in. The preparation of this information will ensure residents are familiar with the operation of the development before moving in.

2.37 In terms of number of transport alternatives easily available to residents and visitors, it is considered that the proposed development is very highly sustainable in terms of public and alternative transport accessibility. The proximity of the development to existing public transport services means that all residents and visitors will have viable alternatives to the private car for accessing the site and will not be reliant upon the car as a primary mode of travel.

2.38 Direct and high-quality pedestrian linkages are provided between the site and the existing pedestrian facilities on the surrounding road network. The entrances to the site will be well lit, so that people can feel secure in using the facilities and can also be monitored by CCTV if appropriate.

2.39 Public transport maps and timetables can be provided in prominent locations on site and the information will be kept up to date by the appointed Travel Plan Coordinator, a role for the Management Company.

2.40 Working Residents and visitors are generally now offered the opportunity to purchase public transport commuter tickets under the current 'Employer Pass' and 'TaxSaver' programmes, by individual Employers. Under these schemes the employer applies to Iarnród Éireann / Bus Éireann for tax free public transport tickets for their employees as an incentive for them to use public transport to travel to work.

2.41 With this in mind, the main focus of this Preliminary Travel Plan will be to promote and support the use of alternative modes to the private car.

3.0 COLLECTION OF BASELINE INFORMATION

Possible Travel Pattern Questionnaires

3.1 Once occupied, and when the Travel Plan Coordinator is appointed, the occupiers of the proposed development will be encouraged to regularly monitor the Travel Plan initiatives in order to maximise on their success.

3.2 This Report simply provides a structure for the Management Company and the appointed Travel Plan Co-Ordinator to follow from occupation.

3.3 Shortly after occupation of the new development, a detailed travel-questionnaire will be compiled and distributed to new staff and residents for completion. The aim of the travel questionnaire will be to establish travel patterns between work and home and school among other travel demands. The information gathered from this survey will be used to inform the further development of the Travel Plan.

3.4 The Baseline Survey information will also allow the Travel Plan Coordinator for the development to set realistic modal-split targets for the development.

3.5 It is anticipated that, given the location and good transport links at this development, combined with the reduced level of available car parking on site, there will be a high percentage of use via public and alternative transport.

3.6 The Travel Plan will need to maintain this positive modal split and improve it, where possible. It is informative to note that the "Smarter Travel: A Sustainable Transport Future" (DOT) Objective for 2020 is to achieve a reduced work-related commuting by car modal share of 65% to 45%.

4.0 THE TRAVEL PLAN

4.1 The successful implementation of a Travel Plan will ensure that, in-so-far-as-possible, the impacts of this traffic are reduced and minimised where practical, while providing a number of environmental and economic advantages detailed below.

4.2 The following sub-sections detail the available initiatives which will serve to better manage travel demand, and therefore the traffic impact of work-related journeys, focused on the movement of residents during peak times. This Report provides a structure for the Management Company and the appointed Travel Plan Co-Ordinator to follow from occupation.

Walking

Walking - Key Information	
Approx. Zone of Influence	3.5km
Percentage of Residents working in area of influence	TBC in each survey when occupied
Percentage of Residents interested in Walking	TBC in each survey when occupied

Table 4.1 – Key Information: Walking

4.3 There are many local, global, and personal benefits to walking, a few of which are listed following:

- **W** - Wake Up! - Studies have shown that people who walk to work are more awake and find it easier to concentrate.
- **A** - Always one step ahead - Walking makes people more aware of road safety issues and helps them develop stronger personal safety skills.
- **L** - Less congestion - If you leave the car at home and walk, there are fewer cars on the road which makes it safer for those who walk and cycle.
- **K** - Kinder to the environment - By leaving the car at home you are reducing the amount of CO 2 produced and helping to reduce the effects of climate change and air pollution.
- **I** - Interpersonal skills - Walking to work or school can be a great way to meet other walkers, share the experience, and develop personal skills.
- **N** - New adventures - Walking to work or school is a great way to learn about your local environment and community. It's also a fun way to learn about the weather, landscape, and local ecosystems.
- **G** - Get fit and stay active - Walking to and from work or school helps people incorporate physical activity into their daily routines. Research shows that regular physical activity can benefit your body and mind.

4.4 Most adults will consider walking a maximum of 3.5 km (Approx. 30/40 minutes) to work. Residents and visitors working within a 3.5 km radius of the site will be encouraged to walk to work as often as their schedule permits. Similarly, school trips can be encouraged on foot.

4.5 The following initiatives and incentives can be used to encourage walking to work or school:

- Take part in a 'Pedometer Challenge' which is organised through the Irish Heart Foundation or Smarter Travel Workplaces;
- Organise special events such as a 'Walk to work/school on Wednesdays' where participants are rewarded for their participation;
- Keep umbrellas in public areas on a deposit system for use when raining;
- Display Smarter Travel Workplaces Accessibility Walking maps on notice boards areas so Residents and visitors can plan journeys;
- Organise lunch time or afternoon walks as part of a health and well-being programme;
- Highlight the direct savings gained due to reduced use of private vehicles.

Cycling

Cycling – Key Information	
Approx. zone of influence	10km
Percentage of Residents Surveyed known to Work within the area of influence	TBC in each survey when occupied
Percentage of Residents interested in cycling	TBC in each survey when occupied

Table 4.2: Key Information - Cycling

4.6 Research suggests that cycling is a viable mode of transport for people who live up to 10 km from work or school.

4.7 Cycling is a great way to travel. It helps foster independence, raises awareness of road safety, and helps the environment.

4.8 Some positive aspects of cycling to work or school are listed following:

- **C** - Cycling is fun! - Cycling is a great form of transport but it's also a great recreational activity. Cycling is a skill that stays with you for life and it's a fantastic way to explore your local community.
- **Y** - You save time & money - cycling to work reduces the need to travel by car thus reducing fuel costs and freeing up road space for more cyclists;
- **C** - Confidence building - travelling to work as an independent cyclist can give people increased confidence proving beneficial in all aspects of life;
- **L** - Less congestion - If you leave the car at home and cycle to work there are fewer

cars on the road which makes it safer for those who cycle and walk to work or school;

- **I** - Interpersonal skills - Cycling to work or to school can be a great way to meet other cyclists and share the experience;
- **N** - New adventures - Cycling to work or school is a great way to learn about your local environment and community. It helps people to understand where they live and how their actions affect their local environment;
- **G** - Get fit and stay active - cycling to and from work or school helps people incorporate physical activity into their daily routines. Research shows that regular physical activity can benefit your body and mind.

4.9 The provision of enhanced and attractive cycle parking facilities at the site will clearly play a critical role in promoting journeys by bicycle.

4.10 The following initiatives and incentives can be used to encourage cycling to work and school:

- New cycle parking installed within the development, secure and well lit;
- Publicise cycle parking availability by way of signage and on notice boards;
- Display maps on notice boards areas so people can plan journeys;
- The development can provide free cycle accessories (panniers, lights, high-visvests, helmets) in periodic draws for cyclists,
- The Travel Plan Coordinator can organise cycle training sessions on site on the rules of the road and the specific risks associated with the locality;
- The Travel Plan Coordinator can invite bike suppliers on site for a 'Green Day' or 'Green Week' so that people can try bikes before buying;
- The Travel Plan Coordinator can set up a Bicycle User Group (BUG) to promote cycling;
- The Travel Plan Coordinator can highlight the direct savings gained due to reduced use of private vehicles;
- The Travel Plan Coordinator can encourage residents and visitors to take part in National Bike Week, see www.bikeweek.ie.

Public Transport

Public Transport – Key Information	
Approx. zone of influence	All Residents
Percentage of Residents in area of influence	100%
Percentage of Residents using Public Transport	TBC in each survey when occupied

Table 4.3: Key Information: Public Transport

4.11 There are many benefits to taking public transport, some of which include:

- Personal Opportunities – Public transportation provides personal mobility and freedom;
- Saving fuel – Every full standard bus can take more than 50 cars off the road, resulting in fuel savings from reduced congestion;
- Reducing congestion – The more people who travel to work or to school on public transport, especially during peak periods, the less people travelling by private car;
- Saving money – Taking public transport to and from work or school is a lot cheaper than travelling by car and saves the cost of buying, maintaining and running a vehicle;
- Reducing fuel consumption – A full standard bus uses significantly less fuel per passenger than the average car;
- Reducing carbon footprint – Public transport is at least twice as energy efficient as private cars. Buses produce less than half the CO2 emissions per passenger kilometre compared to cars and a full bus produces 377 times less carbon monoxide than a full car;
- Get fit and stay active - Walking to and from work or school to public transport helps people incorporate physical activity into their daily routines. Research shows that regular physical activity can benefit your body and mind.
- Less stress – Using public transport can be less stressful than driving yourself, allowing you to relax, read, or listen to music.

4.12 The following initiatives and incentives can be used to encourage people to take public transport:

- Publicise Employee Tax Saver Commuter tickets, which offer savings to employers in PSRI per ticket sold and significant savings to employees in marginal tax rate and levies on the price of their ticket;
- Encourage public transport use for travel by promoting smart cards, advertising the availability of these tickets to Residents;
- Publicise the availability of Real Time Information. Real Time Information shows when your bus is due to arrive at your bus stop so you can plan your journey more accurately;
- Provide maps of local bus routes and the nearest bus stops and the length of time it takes to walk to them;
- Contact local providers about issues such as location of existing and new bus stops, timing of routes, or where you have market information about a potential new route.

Go-Car/Car Sharing

Car Sharing – Key Information	
Approx. zone of influence	All Residents
Percentage of Residents in area of influence	100%
Percentage of Residents Car Sharing	TBC in each survey when occupied

Table 4.4: Key Information - Go-Car/Car Sharing

4.13 Every day thousands of commuters drive to work or to school on the same routes to the same destinations, at the same time as their colleagues. By car sharing just once a week, a commuter's fuel costs can be reduced by 20%, and in a similar fashion, the demand for work place parking can be reduced by 20%. If every single-occupancy driver carried another driver, there would be 50% less cars on the road at peak times.

4.14 Although use of the car to get to work or to school is essential for some people, car sharing schemes such as GoCar (which are active locally as demonstrated) have the potential to deliver a significant reduction in private vehicle trips by promoting higher than average occupancy rates for each vehicle.

4.15 Car sharing often happens informally, however some participants often prefer a formal scheme such as a GoCar facility which will normally generate a higher take-up for car sharing, and more efficiency in terms of increased occupancy rates.

4.16 Encouraging more Residents and visitors to share car journeys to work rather than driving alone as well as encouraging more to set up and take part in car sharing/pooling would prove a very effective means of reducing daily car trips to and from the site.

4.17 The following initiatives and incentives can be used to encourage car sharing:

- Highlight to drivers that they do not have to share with a person that doesn't suit them – allow choice based on gender, route, smoking or non-smoking;
- Clarify the financial implications of the scheme – those accepting a lift could contribute towards fuel costs.
- Use existing online databases for car sharing. For example, the development could set up its own private car sharing site.

Action Plan Summary Table

4.18 The Summary Action Plan is described in the Table below. Modal Split Targets will be determined following on from the first survey shortly after full occupation, typically within the first six months. This will be part of the role of the Travel Plan Coordinator. This will show existing travel patterns with realistic targets set to improve the modal split of Residents.

	Initiative	Impact on Delivery	Difficulty Delivering	Current Modal Split	Target MS
Residents Initiatives	Walking	Medium	Low	TBC	TBC
	Cycling	Medium	Medium	TBC	TBC
	Public Transport	High	Low	TBC	TBC
	Other	Medium	Medium	TBC	TBC
	Car - Sharing	Medium	Medium	TBC	TBC
	Cars - 1 Passenger Only	High - Negative	High	TBC	TBC
Promoting the TP	Marketing the Plan	High	Low	Driven By TP Coordinator	
	Measuring Success	High	Medium	Annual Surveys	

Action Plan Summary Table

5.0 IMPLEMENTING THE PLAN

Background

5.1 Setting realistic targets and a sustained approach to the promotion of the Travel Plan is important if the measures are to be successful. The objectives and benefits of the Plan will be made clear and broadcast during the full lifecycle of the Plan.

5.2 The implementation of a successful Travel plan will require the upfront investment of resources. As well as reviewing objectives and initiatives regularly, it is equally important to measure results. This provides an indication of any Plan's success and ensures that the targets remain realistic.

The Travel Plan Coordinator

5.3 The key objective of this Travel Plan is to ensure that the traffic impacts and car usage associated with the operation any development are minimised. Achieving this objective will result in a wide array of benefits for the development and its stakeholders.

5.4 To ensure the plan is effective it is essential for a Travel Plan Coordinator to be appointed for the Development upon occupation. It is anticipated that this is a role which will be fulfilled by the Management Company.

5.5 It is envisaged that the coordinator will work closely with residents to enthusiastically promote and market the Travel Plan. As residents will be the focus of the plan, their involvement must be sought from the outset.

5.6 To support the Travel Plan Coordinator's efforts, the Management Company must ensure that they have sufficient time to carry out their duties. In addition, it is essential that the powers of decision making are bestowed upon him/her, along with a suitable budget and programme for implementation.

Promoting the Travel Plan

5.7 Active promotion and marketing is needed if the Travel Plan is to have a positive impact on stakeholder travel patterns to and from the site.

5.8 All marketing initiatives should be focused on areas where there is willingness to change. Such information has been extracted from the questionnaires and has been described in Section 3 of this Plan.

- **Identify the Aim** – e.g. to reduce low occupancy car commuting, school, and business travel & to promote active travel, public transport & alternatives to travelling by car.

- **Brand the Plan** – as part of communicating the Travel Plan, visually brand all work relating to it with a consistent look, slogan, identity or logo.

- **Identify the Target Audience** – 'segment the audience' (e.g., shift workers, school travel, sedentary workers, people travelling long/ short distances, mode used, members of a walking club or green team) so you can target the message and events towards these different groups.

5.9 As part of the marketing process, the Travel Plan coordinator can personalise a plan for the Development, drawing attention to the benefits of participation and support for its implementation.

5.10 The coordinator can identify communication tools and networks used by the different audiences in the development and use these to communicate about travel.

5.11 Promotional material regardless of its quality is only as good as its distribution network; material incentives assist greatly in introducing people to alternative modes of commuting.

5.12 The plan should be about promoting equity among modes and offering choice and accessibility.

5.13 The coordinator can promote positive messages associated with a plan, for example, reduced tax/PRSI payments, getting fit and active, reducing congestion, reducing CO2 emissions and so on, and encourage people to start small – changing one day per week for example, to explore their options.

5.14 Marketing drives which feature individual residents and visitors who have reduced their car use can carry a strong message. This will serve to raise not only the profile of the Plan, but also send a clear message in relation to the residents and visitors commitment to the Plan.

6.0 CONCLUSIONS

6.1 The Proposed Development accords with the principles of sustainable development, being located within an established and developed area with clear and easy access to alternative modes of travel. With significantly reduced private car parking provided, this also acts as a demand management measure. The Management Company, once the development is occupied, will utilise pragmatic measures that encourage safe and viable alternatives to the private car for accessing the development.

6.2 Good Travel Planning is not a one-off event, it is instead an on-going iterative process requiring continued effort. This Preliminary Report assists these efforts by forming an outline framework and providing guidance for its success. Monitoring and reviewing the initiatives set out within the plan will form a far greater part of the Final Travel Plan itself.

6.3 The key to the Plans success will be the appointment of a ***Travel Plan Coordinator*** for the development, once occupied. They will be vested with total responsibility for implementing the plan. They should be granted the authority and time to execute the Plan and be provided with sufficient resources to realise the Plans success.

6.4 As staff and residents are the focus of the plan, their involvement should be sought from the outset following occupation. To this end, the Plan Coordinator should be assisted and supported by the Management Company, staff, residents and visitors. This will serve to spread the workload, and also give the staff, residents and visitors a valuable input into the operation of the Plan.

6.5 Successful Travel Plans require marketing **and** regular review. The measures set out in the Action Plan Summary Table (Chapter 4) should form the basis of a sound, realistic Plan and should be clearly set out and be fully transparent to all users.

6.6 Staff and Residents also have an essential responsibility in terms of co-operating with and taking an active part in the plan. They are, after all, the plan's primary focus.

6.7 It is recommended that the Final Travel Plan be set in motion, sensibly at full development occupation. The plan should evolve and develop with the development, taking into account changing Residents and visitors and their travel preferences and needs.

6.8 Annual reviews of the Plan should include a full stakeholder survey, providing valuable information for target setting and marketing target groups. It is emphasised that failing to meet initial targets should not be seen as failure, as the preliminary 12 to 18 months of the plan should be viewed as a calibration exercise for target setting.