consulting engineers

NRB

Transportation Assessment Report

including....
Preliminary Travel Plan,
DMURS Statement of Consistency
Stage 1 Road Safety Audit
&
Bus Service/Bus Capacity Assessment

For

Proposed Residential Development

At

Sunberry Heights, Blarney.

SUBMISSION ISSUE

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Contents

Appendices

EXECUTIVE SUMMARY

NRB Consulting Engineers Ltd were appointed to address the Traffic & Transportation impact associated with the construction of a proposed revised residential development in Blarney, Co Cork. The revised scheme consists of a total of 105 private residential Housing Units, 38 Apartments and a small ancillary Crèche in the established town centre setting. We have assessed the impact of the traffic associated with the Residential Elements & Crèche on the local road network.

The Transportation Assessment has been prepared in accordance with the TII's Traffic & Transportation Assessment Guidelines and addresses the traffic impact of the proposals.

The assessment is based on comprehensive Weekday AM and PM Peak classified traffic interval movement surveys of the adjacent road network carried in preparation for this study during normal school term time prior to the Pandemic Restrictions. The Analysis and Assessment includes the traffic associated with adjacent relevant committed/permitted developments (ABP309152-21 & ABP308670-20, being the Primary Care Centre and the Mixed-use Development at the former Blarney Park Hotel).

The Report & analysis includes an assessment of impact of all the proposed housing during a selected Opening/Occupation Year 2024 together with an assessment of the (+5) Design Year 2029, and the (+15) Design Year 2039 (Design Years as requested by Cork City Council). It should be noted that any requirement to select different years of assessment, for example due to development phasing, is considered very unlikely to impact the conclusions of the study.

The Report addresses the adequacy of the existing road network to safely and appropriately accommodate the worst case peak hour vehicular demands associated with the committed and proposed developments combined, and in particular the safety and capacity of the intensified use of the Sunberry Heights junction onto the R617 which will serve the development. The Transportation Assessment Report confirms that there is an acceptable local traffic impact associated with the opening of the proposed revised subject residential development together with committed developments.

The assessment also confirms that the R617 Junction and the adjacent junctions will operate without any adverse capacity issues arising during the selected year of opening and the Design Years 5 & 15 years after opening, with negligible traffic changes.

The assessment includes a Preliminary Mobility Management Plan (MMP or Travel Plan) for the site which is included as a separate report as ***Appendix E.***

We have also prepared a Statement of Consistency with DMURS and confirm that the internal layout is compliant with the requirements of DMURS and this is included and appended as ***Appendix F***.

An independent Road Safety Audit of the Access Design and internal layout will be undertaken at Full Application stage and will be included as ***Appendix G*** to this Report.

A Bus Service & Bus Capacity Assessment has been undertaken and is included as ***Appendix H*** to this Report.

Based on our studies, we believe that there are no traffic/transportation capacity, or no significant insurmountable traffic safety or operational issues associated with the proposed revised development that would prevent a positive determination of a planning application by An Bord Pleanála.

1.0 INTRODUCTION

1.1 This Transportation Assessment (TA) has been prepared by NRB Consulting Engineers Ltd and addresses the traffic capacity considerations relating to the proposal to construct a residential development including a small ancillary crèche within Blarney, Co Cork.

1.2 The Report addresses the impact of the proposed development and its effect on the adjacent road network for both the weekday AM and weekday PM Peak Hours.

1.3 A site location plan for the development is included below as ***Figure 1.1***.

Figure 1.1: Site Location Plan in Context of Blarney

1.4 The existing established vehicular access to the lands from the public roads via Sunberry Heights is to be used to serve the proposed site. (Refer to layout plan & access proposals included herein as ***Appendix A***.)

1.5 As the site is within the 50kph speed limit, the Design Manual for Urban Road and Street (DMURS) is applicable here and can be used to access the sightline requirements. The available sightlines meet these requirements, with some adjustment to the public road which improve the existing situation for all road users. Layout plans showing the development and design considerations in terms of the access arrangement are included herein as ***Appendix A***.

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

- Very Small Scale of Development Proposals (conscious that the development constitutes in-fill residential development in a long-established area), with access via established town centre junctions within the 50kph limit,
- Traffic & Transportation impact,
- Includes the Traffic Flows associated with the adjacent committed development (ABP Permissions ABP309152-21 and ABP308670-20),
- Capacity of the proposed access to accommodate the worst-case development traffic flows,
- Impact of the development on the free flow and capacity of the adjacent Local Roads.

1.7 Recommendations contained within this Transportation Assessment are based on the following sources of information and industry-standard practices:

- Discussions with Cork County Council Roads/Transportation Officials,
- Transport Infrastructure Ireland (TII) Traffic & Transport Assessment Guidelines,
- TII PE-PAG-02017 Project Appraisal Guidelines for National Roads Unit 5.3,
- Comprehensive Interval Classified Traffic Surveys undertaken prior to the Covid 19 Pandemic during normal school term time,
- A review and extraction of information from on-line planning files for ABP309152-21 and ABP308670-20,
- Our experience in assessing the impact of Developments of this Nature, and
- Site visits, photos and Observations.

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

2. RECEIVING ENVIRONMENT & DEVELOPMENT PROPOSALS

2.1 The proposed development site is located on infill lands that are surrounded by similar scale and similar density residential developments. Due to the topography and elevated nature of the site and the hinterland, notably there are very limited accessibility options for the subject lands, save for the established access via Sunberry Heights.

2.2 Sunberry Heights, onto which the site is to be connected, is a Local Road serving housing only. It is relatively steep in nature and consists of a single carriageway road with a continuous footpath along its western boundary. The road is subject to a 50kph urban speed limit past the site (whilst informal 30kph signage appears to have been recently erected at the time of completion of this report).

2.3 A review of the Road Safety Authority (RSA) online collision database indicates that there is no record of significant vehicular collisions proximate to the proposed site access, between 2005-Date inclusive (As evidenced below - Refer ***Figure 2.1***)**.**

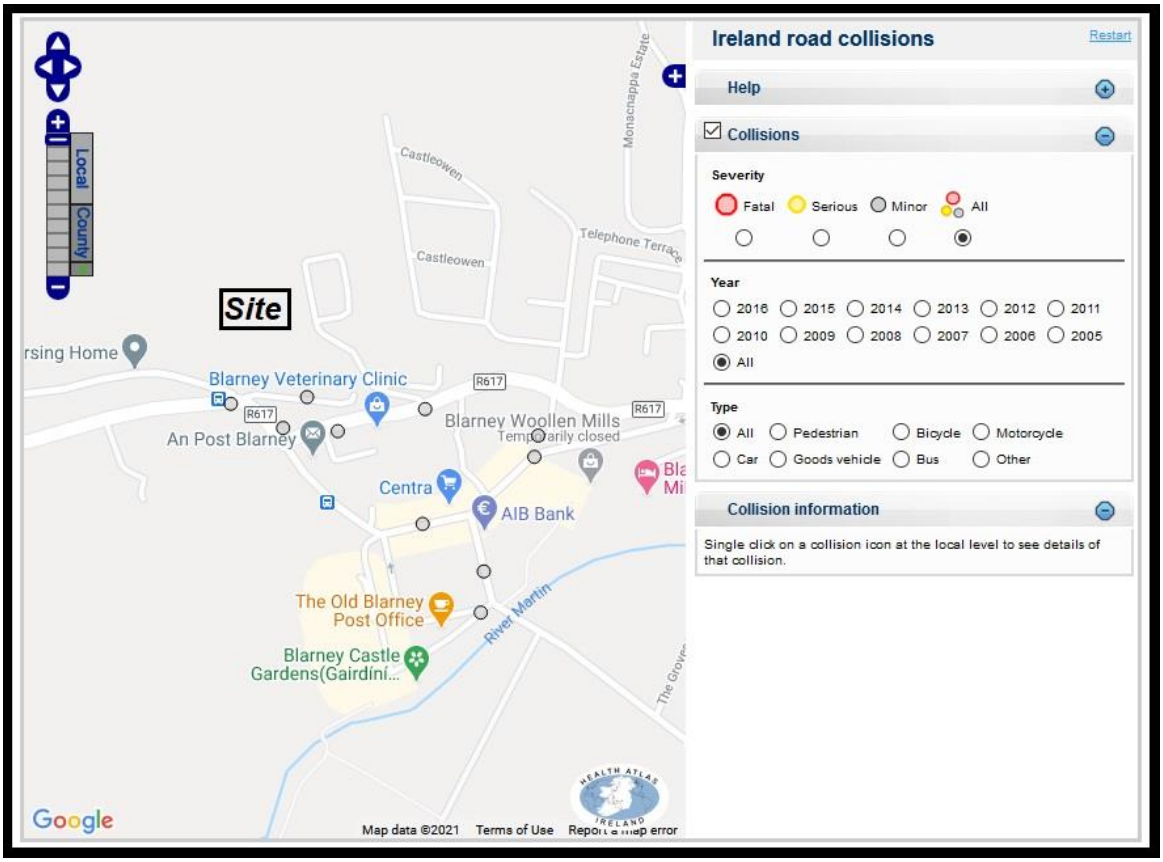


Figure 2.1 ; RSA On-line Collisions Record

2.4 Based on the traffic survey, Sunberry Heights is very lightly trafficked indeed, with a weekday AM peak hour 2-way traffic flow of 20 Passenger Car Units (PCUs or Car Equivalents) and a weekday PM peak hour 2-way flow of 21 PCUs. To set these in context, a road of this nature has a theoretical free flow link capacity of approximately 800-1,000 PCUs per direction per hour. In this regard, the road is considered very lightly trafficked. It is recognised that the capacity of roads are ordinarily determined by the capacity of terminal junctions, however in terms of link capacity the road is lightly trafficked.

2.5 Sunberry Heights is quite steep, and meets with the Regional Road R617 to the south in the form of a simple priority junction. There are currently somewhat restricted sightlines due to overgrown verges to the west, however these are easily remedied by normal maintenance. Observation of operational performance indicated that the junction operates within capacity, with access and egress to and from the R617 eased and further facilitated through normal driver courtesy.

2.6 The R617 Regional Road is a moderately trafficked route linking Blarney to the N20 and onwards to Cork City. It carries with a weekday AM peak hour 2-way traffic flow of approximately 1,130 PCUs and a weekday PM peak hour 2-way flow of approximately 1,160 PCUs. A road of this nature has a theoretical free flow link capacity of approximately 1,000 PCUs per direction per hour. In these terms it currently operates well below capacity, in link-capacity terms. However, it is accepted that the capacity of urban roads is governed by and controlled by the traffic capacity of junctions and normal urban interaction along its route. In these terms the road is accepted locally as being 'busy'.

2.7 A housing development of this nature generates way less than one car movement per unit during each of the commuter peak hour periods, as evidenced by the analysis contained herein as Section 3. Notwithstanding the very low expected traffic volumes associated with the proposed development, we have nonetheless undertaken detailed modelling and analysis of the junction of the R617/Sunberry Heights and the junction of St Ann's Road with the R617 to the west. Analysis was undertaken for a selected year of opening/occupation of 2024 and associated design years of 2029 and 2038 specifically in accordance with a recent request from CCC. It should be noted that the selection of later opening or associated design years (for example by 1, 2 or 3 years) would have no implications whatsoever for the conclusions of the study.

2.8 We have included traffic flows associated with the adjacent permitted Primary Care Centre and also the larger Mixed-use development on the former Blarney park Hotel site, with this traffic data extracted from the supporting reports for these applications, available via on-line portals (ABP Permissions ABP309152-21 and ABP308670-20). The location of these permissions in the context of the site are illustrated below as ***Figure 2.2***

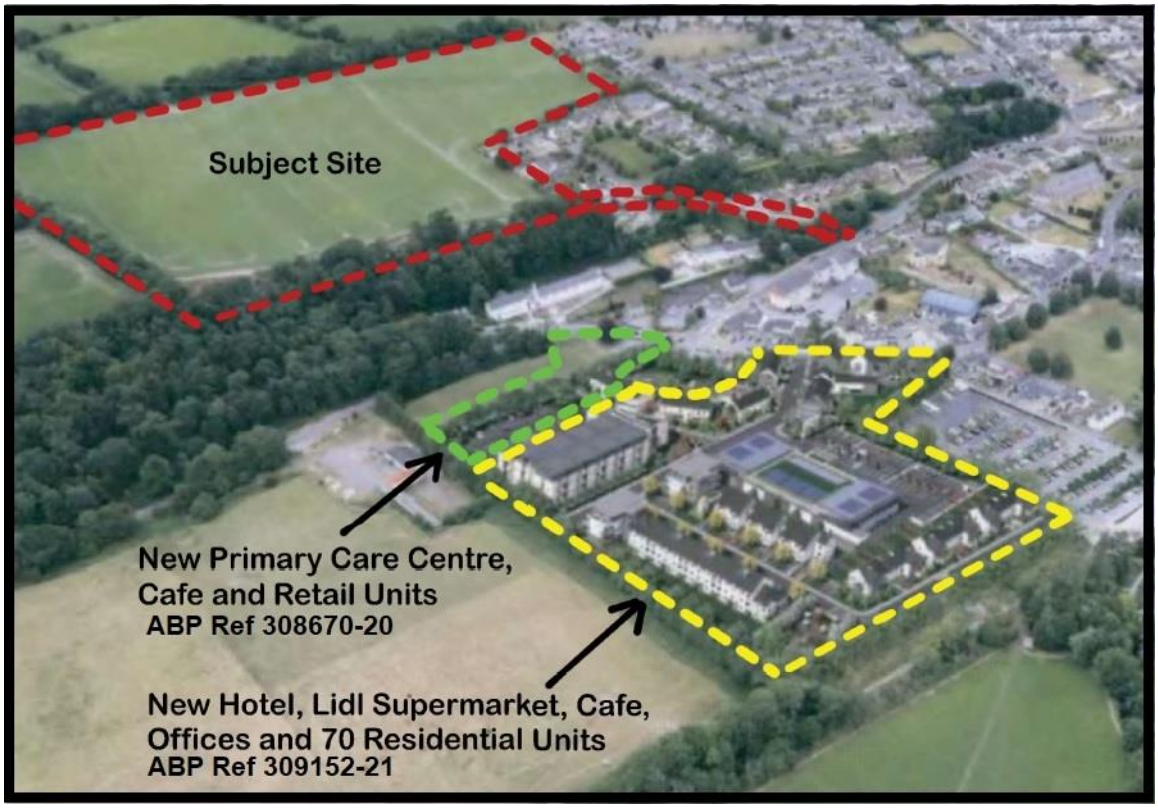


Figure 2.2 ; Adjacent Committed/Permitted Developments

2.9 The TII Traffic/Transport Assessment Guidelines requires that traffic associated with permitted developments be considered within the assessment ("***Committed Development***"). We have therefore extracted the predicted weekday AM and PM Peak Hour traffic volumes associated with these applications, and included these within the analysis.

2.10 The assessment guidelines require assessment to be undertaken in instances where the predicted traffic increases associated with development traffic exceed 10%. It is clear in this case that increases in traffic due to the introduction of the subject residential development at all junctions within the study area are below this threshold (Refer Page 4 & 9 of ***Appendix C***). Notwithstanding, we have undertaken modelling to demonstrate availability of capacity to facilitate the proposed development.

2.11 A detailed classified traffic survey was undertaken of the key junctions in proximity to the site during normal school term prior to the Covid 19 Pandemic Restrictions. This included a comprehensive classified interval survey of each of the affected junctions. This data was used in order to establish current peak commuter hour traffic conditions and to establish the current usage of the roadways. Details of the surveys undertaken are included as ***Appendix C***, with the Peak Hour Network flows transferred (expressed as PCUs) identified. This traffic survey has been used as the basis for the study.

Development Proposals

2.12 The proposed Development consists of the following elements;

- The construction of a total of 105 New Residential Houses,
- The construction of 38 apartments,
- The construction of a small ancillary Crèche,
- The means of vehicular access to the sites will be via a priority junction access onto Sunberry Heights with improvement works to the existing Sunberry Heights Access arrangements as shown in ***Appendix A***,
- High Quality parking provision,
- High Quality footpath linkages,
- Turing areas to facilitate Refuse vehicles, and
- Landscaping and surface treatment.

2.13 It is anticipated that the development will be serviced using refuse lorries as required, with small transit vans or small-wheelbase trucks, which do not have onerous swept-paths and can easily be facilitated. The small scale of the entire facility is confirmed through the robust assessment of Traffic Generated, which is addressed further within Section 3 of this Report.

2.14 In terms of ***Committed Development***, we have reviewed permitted developments in the Road Network Area of Influence, and our analysis now includes the traffic associated with the adjacent developments identified in Section 2.8 & 2.9 above.

3. TRIP GENERATION, ASSIGNMENT AND 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. We have included as ***Appendix B*** the TRICS output for Private Housing, Apartments and a crèche, which provides an estimation of traffic as illustrated in ***Table 3.1***, **3.2**, ***3.3*** and ***3.4*** below.

3.2 It should be noted that whilst we have assigned traffic associated with the crèche, the reality is that the crèche will most likely generate a small number of drop-off or pick-up trips from within the proposed residential development only. We have specifically included Irish Survey data within the output:

Table 3.1: TRICS Data, 105 Residential Housing Units

Road Network Period	Arrivals		Departures		Total 2-Way Car Trips
	Rate/Unit	Car Trips	Rate/Unit	Car Trips	
Weekday AM Commuter Pk Hour	0.133	14	0.381	40	54
Weekday PM Commuter Pk Hour	0.352	37	0.180	19	56

Table 3.2: TRICS Data, 38 Residential Apartments

Road Network Period	Arrivals		Departures		Total 2-Way Car Trips
	Rate/Unit	Car Trips	Rate/Unit	Car Trips	
Weekday AM Commuter Pk Hour	0.056	2	0.193	7	9
Weekday PM Commuter Pk Hour	0.177	7	0.083	3	10

Table 3.3: TRICS Data, 310m^2 GFA Crèche Unit

Road Network Period	Arrivals		Departures		Total 2-Way Car Trips
	Rate/100m2	Car Trips	Rate/100m2	Car Trips	
Weekday AM Commuter Pk Hour	3.568	11	2.857	9	20
Weekday PM Commuter Pk Hour	2.521	8	3.154	10	18

Table 3.4: TOTAL Peak Hour Car-Equivalent Traffic Generated by Subject Site

Network Period	PCU Arrivals	PCU Departs	Total
Weekday AM Peak Hr	27	56	83
Weekday PM Peak Hr	52	32	84

3.3 In the case of residential development, the application of TRICS in this case specifically includes similar Irish residential sites within the surveys. Therefore, particularly as we have assigned traffic associated with the crèche as separate additional traffic, we consider that the assessment is Robust and Onerous and the Trip Rates used provides for a onerous reflection of the expected worst case traffic generated by the proposed development, summarised above as ***Table 3.4***.

3.4 Notwithstanding, in light of observation of existing capacity conditions, and the existing lightly trafficked roads, the use of significantly higher Trip Rates, if required for any reason, would have absolutely no impact upon the conclusions of the study. This is particularly the case given the clear modelled reserve capacity that exists and the low threshold impact as demonstrated in ***Appendix C***.

3.5 We undertook a Traffic Survey of the existing roads and affected junctions, prior to the Covid 19 Pandemic, during normal school term, in order to establish background traffic conditions. Details of the surveys are also included here as traffic flow stick diagrams as ***Appendix C***.

3.6 In Traffic Engineering all vehicles are expressed in terms of “Passenger Car Units” (PCUs), sometimes referred to as “Car Equivalents”. This is the methodology that has been employed here, with specific industry standard conversion factors to convert HGVs, Skip Lorries, Cars/Trailers and Bin Lorries to PCUs. The conversion factors used are in accordance with industry-standard recommendations.

3.7 We have assigned the traffic to the road network based on the industry standard assumption that the trip patterns will mirror the existing established weekday AM and PM peak hour traffic count data in terms of traffic turning proportions and distribution at junctions and in particular here, they reflect the observed patterns during the commuter peak hours on the local roads.

3.8 The Guidance recommends that we are required to provide a robust and onerous assessment of the likely impact of the proposed development, in order to provide reassurance that the road infrastructure is adequate to accommodate a facility. We have therefore assigned the development traffic to the local roads based on the onerous assumption that **ALL** of the traffic is new traffic.

3.9 The resulting traffic flow diagrams for the subject site are included as ***Appendix C***.

3.10 We have selected a year of opening/full occupation of 2024 for the purposes of this assessment, however it should be noted that minor changes of 2-3 years in the selected or actual year of opening will have no impact whatsoever on the conclusions of the study. We have also undertaken assessment of the associated Design Years 2029 & 2039, 5 and 15 years following opening. The analysis includes the traffic associated with the committed development consistent with the requirements of the TII Guidelines.

3.11 Traffic growth factors for future year assessments were calculated from data obtained in 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 Cork), 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

Table 3.5 - Traffic Growth Rates Applied, TII Project Appraisal Guidelines

Year	to Year	Unit 5.3:
Surveyed	2024	1.105
2024	2029	1.087
2029	2039	1.102

4. TRAFFIC IMPACT - ACCESS JUNCTION CAPACITY

4.1 In accordance with our methodology, we have closely followed and adhered to TII's Traffic and Transportation Assessment Guidelines, in the assessment of the traffic impact resulting from the proposed development.

4.2 TII's Traffic and Transportation Assessment Guidelines requires that a threshold assessment & analysis is undertaken to determine the increases in traffic associated with any particular development, and whether this might be considered as significant. For developments to be located in areas with roads that are considered as 'congested', the Guidance recommends the use of ***Threshold-levels of traffic increase of 5%***, which if exceeded require further assessment to be undertaken. The Threshold level is set at **10% for uncongested conditions**.

4.3 With accurate trip rates applied, and with the effect of the committed development included, the subject development is expected to result in traffic increases on the Local Roads which are generally well below the TII-Recommended threshold levels. We have undertaken the Threshold Assessment for the selected opening year in accordance with the Guidelines, and this demonstrates that the increases on the local network as follows; -

- a 6.4% increase in traffic at R617/Sunberry Heights in the AM Peak Hour,
- a 6.2% increase in traffic at R617/Sunberry Heights in the PM Peak Hour,
- a 1.6% increase in traffic at St Ann's Rd/R617 in the AM Peak Hour, and
- a 1.2% increase in traffic at St Ann's Rd/R617 in the PM Peak Hour.

4.4 Away from the Main Access, these worst-case traffic increases are all **well below** the Guideline and industry standard 5% level for "congested" conditions above which further assessment is required, which underscores the robustness of the assessment. 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 10%, so in this context alone increases of 1%-6% will likely go entirely unnoticed. We have nonetheless undertaken detailed analysis of the R617/Sunberry Heights junction for completeness, as the lower 5% threshold requiring assessment is breached. It should be noted that the 5% level is exceeded at the established main road site access due to the low traffic volumes here and is un-associated with high volumes of development traffic.

R617/Sunberry Heights Junction

4.5 We have used the TII-approved software package 'Junctions 9' PICADY' (**P**riority **I**ntersection **C**apacity and **D**ela**y**) software package (as part of the TRL Package 'Junction 9') to confirm that the small increases in traffic associated with the construction of the residential development can be accommodated at the main road junction.

4.6 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.

4.7 We have appended the detailed computer simulation model results (PiCADY Outputs) of the junction modelling in ***Appendix D*** A summary of the results is reproduced below as ***Table 4.1***

Table 4.1: PiCADY Results, With Full Development Completion and Full Occupation Weekday AM/PM Commuter Peak Hours 2024, 2029 & 2039

Modelled Scenario	Period Mean Max Q (PCUs)	Period Max RFC
2024 Opening Year AM Peak 8-9am	0.3	0.22
2024 Opening Year PM Peak 5-6pm	0.1	0.13
2029 Design Year +5 AM Peak 8-9am	0.3	0.25
2029 Design Year +5 PM Peak 5-6pm	0.2	0.14
2039 Design Year +15 AM Peak 8-9am	0.4	0.28
2039 Design Year +15 PM Peak 5-6pm	0.2	0.16

4.8 The results of the modelling clearly show that the junction will have way more than adequate capacity to accommodate the worst case traffic associated with the subject scheme. All of the RFCs are way below the theoretical capacity of 0.85 and no queuing of more than one right turner-in, or one right turner-out, is anticipated (all mean maximum Queue lengths are way less than 1). The results are so favourable that we are confident that the junction could accommodate significantly higher traffic volumes (possibly more than several multiples of the volume) without any capacity related problems arising.

4.9 This is particularly the case given that, when the main road becomes heavily trafficked in urban areas, junctions benefit from driver courtesy which is not reflected in any proprietary simulation modelling. Normal Driver courtesy is not easily reflected in any modelling technique.

4.10 The above analysis confirms that the construction of 105 residential houses, 38 residential apartments and an ancillary crèche will have a negligible impact upon the capacity of the road network in the area and can easily be accommodated without any adverse traffic capacity or traffic safety issues arising.

5. CYCLIST & PEDESTRIAN ACCESSIBILITY/CONNECTIVITY

Cyclists

5.1 Cork City Council & County Councils commissioned and produced a Cycling Network Plan for the Cork City Metropolitan Area and surrounding towns. The objective was to provide a clear plan for the future development of the cycling network in the Metropolitan Area, including Blarney, in order to encourage greater use of cycling for trips to work, school, recreation and leisure. The entire plan is published on the Cork County Council website at the following link;
https://www.corkcoco.ie/sites/default/files/2018-02/Final%20Published%20CMA%20Cycle%20Network%20Plan%20Jan%202017.pdf

5.2 The Cork Cycle Study area is defined on Page 8 of the *Aecom* Plan, and is reproduced below as ***Figure 5.1***

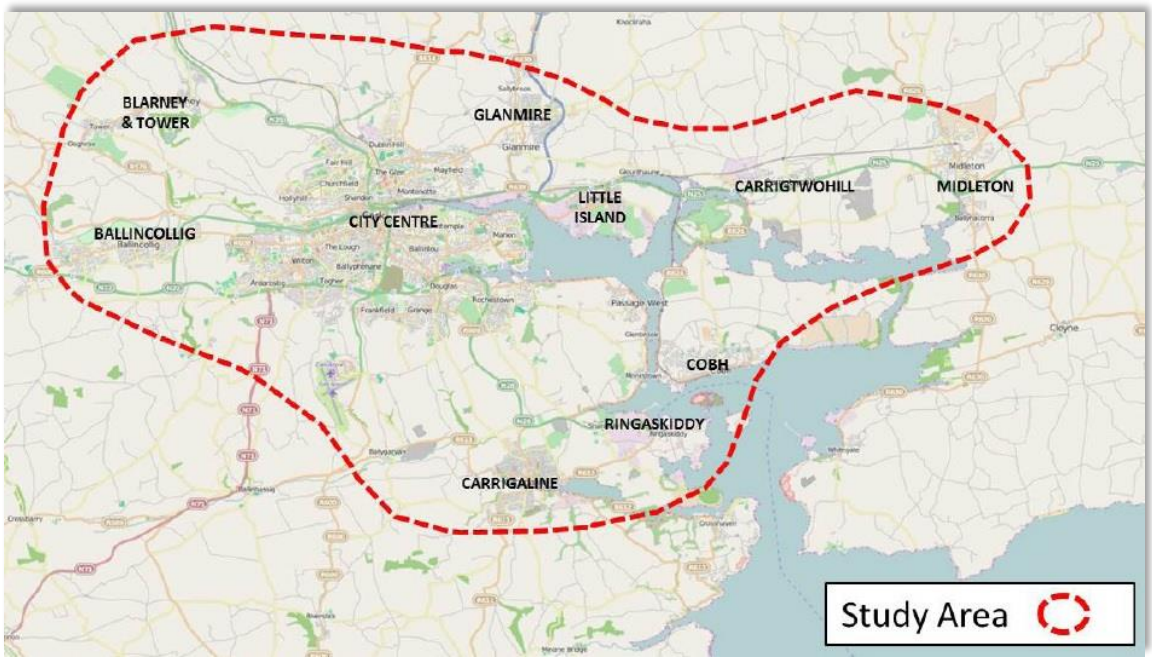


Figure 5.1 - Cork Cycle Network Plan Study Area

5.3 The Report states that many of the Study Area towns have varying quality of cycle infrastructure currently in place, but it sets down a detailed plan showing future improved infrastructure in place for each town within the Study Area. In the case of Blarney, it illustrates the planned network on Page 132, and we have reproduced this plan and the site in context below as ***Figure 5.2***.

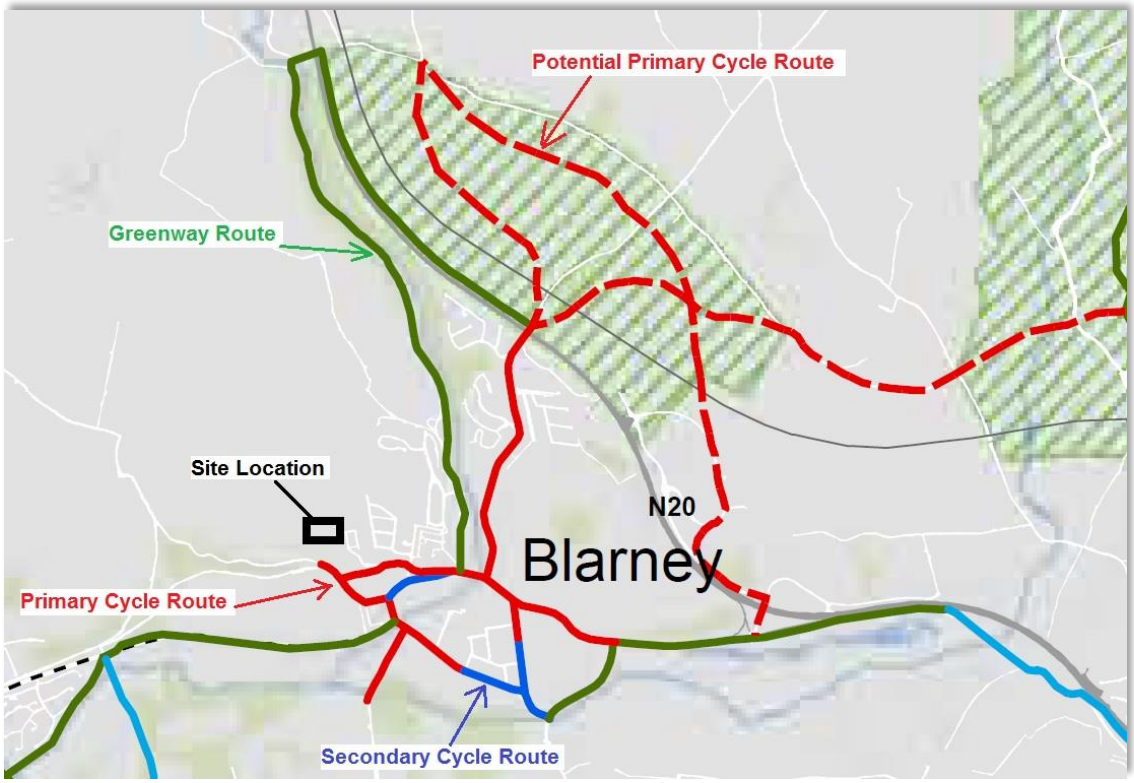


Figure 5.2 - Site Location in Context of Cycle Network Infrastructure for Blarney
(Reference Aecom Cycle Network Plan P132)

5.4 The development is clearly ideally placed in terms of being served by a "Primary Cycle Route" (Solid Red Line above) and is also adjacent a "Greenway Route" (Green Line above). In this regard, the proposed development compliments the Cork Metropolitan Area Cycle Network Plan, and is ideally placed to benefit from the infrastructure.

Pedestrians

5.5 The site is located within the centre of Blarney, and is ideally placed to promote walking as a sustainable mode of travel, reducing the need to travel by car for primary journeys. The site is linked to a high quality network of urban public footpaths on either side of the surrounding streets.

5.6 During previous discussions with Local Authority Roads/Transportation officials it was suggested that we should illustrate the walking distances to schools in the area, as these trips are most easily influenced. We have plotted the walk distance to the local Schools in Blarney on ***Figure 5.3*** below. It should be noted that **there are continuous footpath links between the site and each of these schools**.

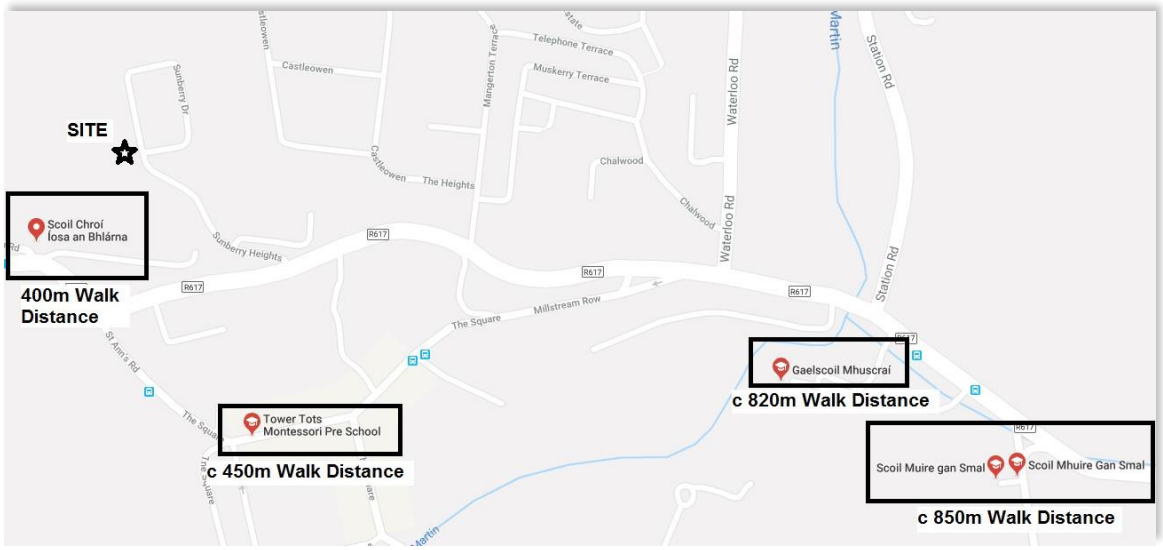


Figure 5.3 - Walk Distances from Site to Blarney Schools

5.7 It is clear from the above that all of the schools in Blarney are within an easy and accessible walk distance of the site, with less than a 15min walk time to the **furthest** school.

5.8 Based on our review, the site is ideally located to benefit from the current and planned pedestrian and cyclist infrastructure within Blarney Town Centre.

Site Connectivity to Local Cycle/Pedestrian Network

5.9 We have illustrated proposed improvements to Sunberry Heights to provide for enhanced connectivity of the site to the local network. These improvements include provision for pedestrians and cyclists, and are as set out on the plan NRB-SK-002 (enclosed within ***Appendix A***) and part-reproduced below as ***Figure 5.4***

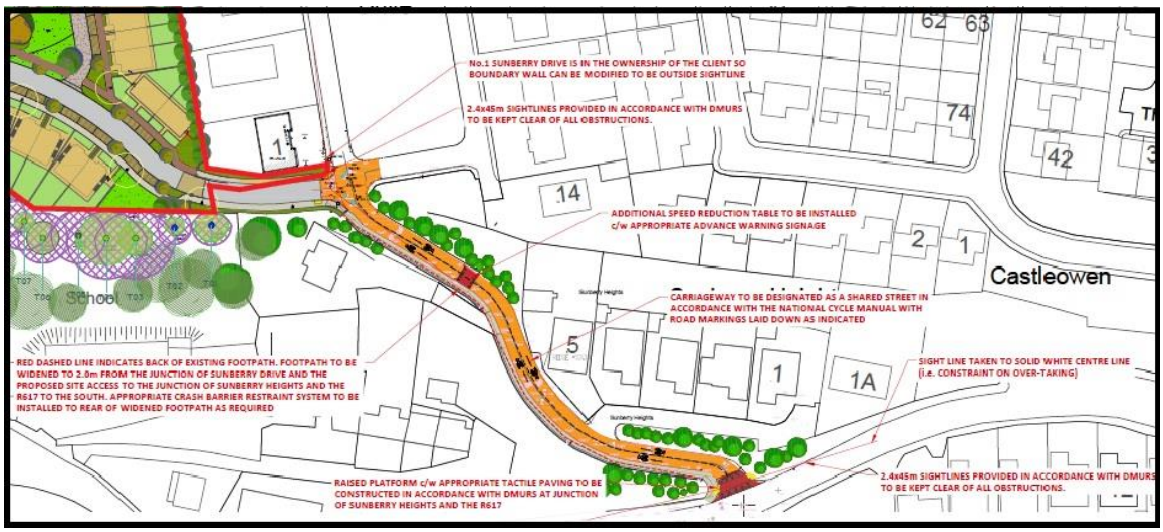


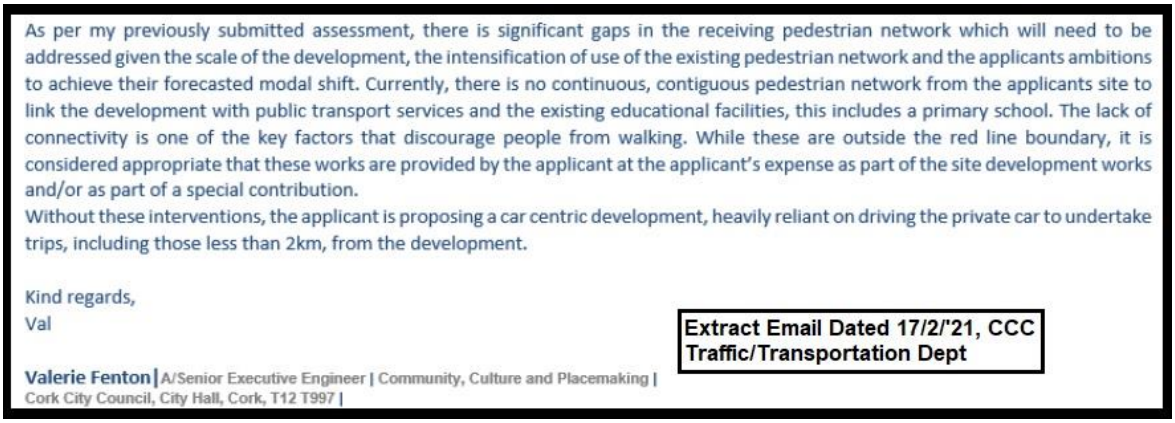
Figure 5.4 - Extract from NRB-SK-002 included as Appendix A

6.0 RESPONSE TO TRAFFIC/TRANSPORTATION ISSUES RAISED BY CCC

6.1 This section of the TA Report specifically addresses Traffic/Transportation raised in the Cork City Council (CCC) overall SHD-Response document, as requested within the ABP Opinion Item #7 which states; -

"Address Issues raised in the Planning Authority's Area Engineers Report and the Road Design Report".

6.2 We include below the relevant extracts from the referenced Area Engineers Report and the Road Report, and other Traffic/Transportation extracts from the CCC submission for ease of reference, together with the NRB response to same



As per my previously submitted assessment, there is significant gaps in the receiving pedestrian network which will need to be addressed given the scale of the development, the intensification of use of the existing pedestrian network and the applicants ambitions to achieve their forecasted modal shift. Currently, there is no continuous, contiguous pedestrian network from the applicants site to link the development with public transport services and the existing educational facilities, this includes a primary school. The lack of connectivity is one of the key factors that discourage people from walking. While these are outside the red line boundary, it is considered appropriate that these works are provided by the applicant at the applicant's expense as part of the site development works and/or as part of a special contribution.
Without these interventions, the applicant is proposing a car centric development, heavily reliant on driving the private car to undertake trips, including those less than 2km, from the development.

Kind regards,
Val

Valerie Fenton | A/Senior Executive Engineer | Community, Culture and Placemaking |
Cork City Council, City Hall, Cork, T12 T997 |

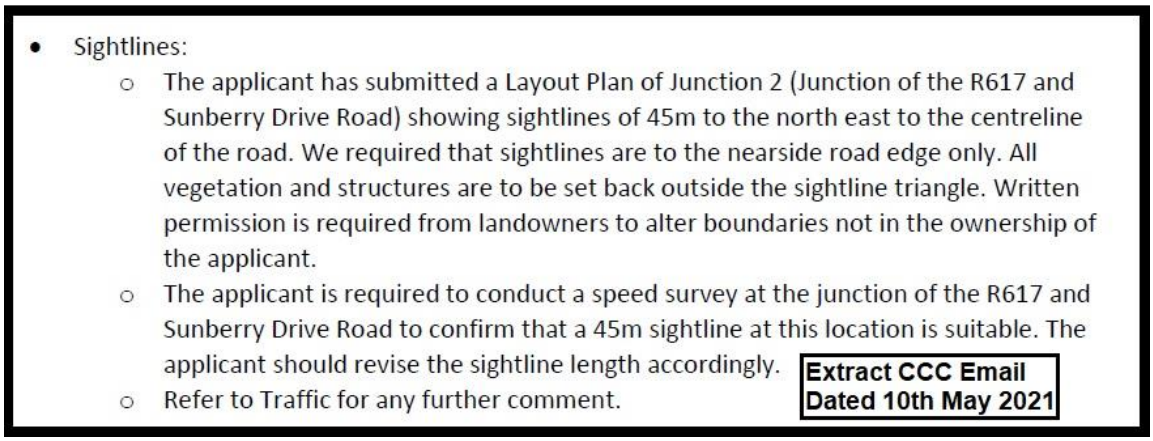
Extract Email Dated 17/2/'21, CCC Traffic/Transportation Dept

Figure 6.1 – Extract Roads Design Report (CCC Email)

NRB Response

6.3 ***Section 5.0*** of this Report deals specifically with Pedestrian & Cyclist connectivity and local network permeability. There are clearly continuous footpaths provided throughout Blarney along both sides of roads and streets, linking the site to the amenities, schools and services. In addition, dedicated safe pedestrian crossings are provided, by way of controlled and uncontrolled facilities on the desire lines between the site and destinations within the area.

6.4 During a subsequent meeting with CCC, the Design Team sought clarity in terms of what the concerns or requirements might be. No further detail or explanation was provided by CCC in relation to the matter raised. We therefore remain of the view that the development is well placed in terms of being in a sustainable location in the heart of the Town Centre, with a range of services, schools & amenities within a short walking or cycling distance, with high quality links and footpaths already in place.



- Sightlines:
  - The applicant has submitted a Layout Plan of Junction 2 (Junction of the R617 and Sunberry Drive Road) showing sightlines of 45m to the north east to the centreline of the road. We required that sightlines are to the nearside road edge only. All vegetation and structures are to be set back outside the sightline triangle. Written permission is required from landowners to alter boundaries not in the ownership of the applicant.
  - The applicant is required to conduct a speed survey at the junction of the R617 and Sunberry Drive Road to confirm that a 45m sightline at this location is suitable. The applicant should revise the sightline length accordingly.
  - Refer to Traffic for any further comment.

Figure 6.2 – Extract Area Engineers Report

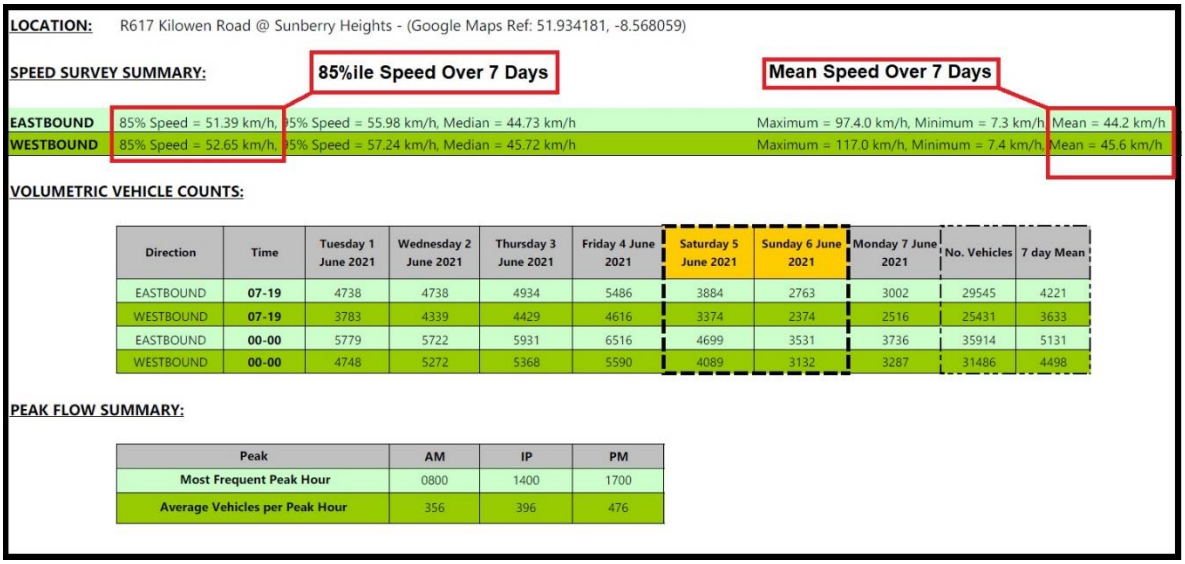
NRB Response

6.5 In terms of the sightlines provided and achieved at the improved **existing** junction, they are fully in accordance with the requirements of DMURS. Where there is a constraint on overtaking, such as here where there is a solid centreline, the sightline to the **less-critical** left-hand-side on exit can be taken to the road centreline. This is fully in accordance with Design Guidance.

6.6 We would also highlight that the independent Road Safety Audit did not identify any problem or issue whatsoever with the proposed sightline at the established access. Provision of excessive sightlines is actually contrary to DMURS as it encourages inappropriate departing speeds.

6.7 We commissioned and undertook a Traffic Speed Survey at the Access, over an entire 7 day week in June 2021. This was undertaken in order to determine the ambient traffic speeds, and in order to ensure that the issue raised by the Area Engineer is addressed in a comprehensive way for ABP. The traffic survey revealed that the **Average** Traffic Speed past the site is 45kph and the **85%ile** Traffic Speed (The Design Speed) past the site is 51kph.

6.8 This speed survey therefore confirms that 50kph is the appropriate speed to use in order to determine the sightline, and the sightline as provided is therefore correct. A Summary Extract from the Automated Tube Count Speed Survey is included below as ***Figure 6.3*** for Reference.



LOCATION: R617 Kilowen Road @ Sunberry Heights - (Google Maps Ref: 51.934181, -8.568059)

SPEED SURVEY SUMMARY: 85%ile Speed Over 7 Days | Mean Speed Over 7 Days

EASTBOUND	85% Speed = 51.39 km/h, 95% Speed = 55.98 km/h, Median = 44.73 km/h	Maximum = 97.4.0 km/h, Minimum = 7.3 km/h	Mean = 44.2 km/h
WESTBOUND	85% Speed = 52.65 km/h, 95% Speed = 57.24 km/h, Median = 45.72 km/h	Maximum = 117.0 km/h, Minimum = 7.4 km/h	Mean = 45.6 km/h

VOLUMETRIC VEHICLE COUNTS:

Direction	Time	Tuesday 1 June 2021	Wednesday 2 June 2021	Thursday 3 June 2021	Friday 4 June 2021	Saturday 5 June 2021	Sunday 6 June 2021	Monday 7 June 2021	No. Vehicles	7 day Mean
EASTBOUND	**07-19**	4738	4738	4934	5486	3884	2763	3002	29545	4221
WESTBOUND	**07-19**	3783	4339	4429	4616	3374	2374	2516	25431	3633
EASTBOUND	**00-00**	5779	5722	5931	6516	4699	3531	3736	35914	5131
WESTBOUND	**00-00**	4748	5272	5368	5590	4089	3132	3287	31486	4498

PEAK FLOW SUMMARY:

Peak	AM	IP	PM
Most Frequent Peak Hour	0800	1400	1700
Average Vehicles per Peak Hour	356	396	476

Figure 6.3 – 7-Day ATC Speed Survey, Summary Results

Traffic & Movement, Accessibility

Most points were raised in previous traffic reports in recent SHD application previously and should also include the following:

- The TTA needs to be more robust and in line with the TII guidelines especially in terms of validating the trip rates used against existing similar developments/sensitivity analysis etc
- TTA needs to include an opening year +5 yr forecast in line with TII guidelines
- Modal shift assumptions need to be included

Overall, there needs to be a corelation between the TTA and how the use of active travel measures are being encouraged. The approach seems to be that if the traffic impact is low then that's ok but what we need to see is how is this development not centred around car based travel which is a challenge given the topography of the site and the poor pedestrian infrastructure from the site to the essential services in the village such as the school.

Figure 6.4 – Extract Main Body CCC SHD Response

NRB Response

6.9 In term of the above extract included as Figure 6.4, we comment as follows;

- The TA Report prepared by NRB has been undertaken in accordance with best practice and fully in accordance with the TII Traffic/Transport Assessment Guidelines.

- The Traffic Generation Calculations are based on calculated rates extracted from within the TRICS Database. 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, and its use is specifically referenced and recommended in the TII Guidance. In this case we have deliberately included sites from Ireland, with 25 actual traffic Surveys of Irish Housing Sites being used for comparison purposes, as evidenced below in the extract from the TRICS output included as ***Figure 6.5***. Suggesting that validation surveys of more housing sites is required to confirm validity of the trip rates used is therefore onerous and in our experience unprecedented.

- The assessment now includes opening year, +5 years and + 15 years.

- With regard to 'Modal Shift Assumptions', the assessment of Traffic Impact has been based on a traditional 'Predict & Provide' approach, with traffic generation rates based on real surveys of other residential sites. In this regard no modal shift assumptions whatsoever have been made in this assessment or need to be made. When an operational Mobility Management Plan is implemented, this will set modal targets for the residents in an effort to promote alternative modes of travel.

	HI	HIGHLAND	1 days
12	**CONNAUGHT**		
	CS	SLIGO	2 days
	GA	GALWAY	1 days
	LT	LEITRIM	2 days
	RO	ROSCOMMON	2 days
13	**MUNSTER**		
	WA	WATERFORD	1 days
14	**LEINSTER**		
	CC	CARLOW	1 days
	WC	WICKLOW	2 days
	WX	WEXFORD	1 days
15	**GREATER DUBLIN**		
	DL	DUBLIN	2 days
16	**ULSTER (REPUBLIC OF IRELAND)**		
	CV	CAVAN	2 days
	DN	DONEGAL	5 days
17	**ULSTER (NORTHERN IRELAND)**		
	AN	ANTRIM	2 days
	DO	DOWN	1 days
	TY	TYRONE	1 days

Figure 6.5 – Extract from TRICS Output within Appendix B

7.0 CONCLUSIONS

7.1 This Transportation Assessment assesses the traffic impact of the proposed 105 houses, 38 apartments and the ancillary crèche on the site located off Sunberry Heights in Blarney. This Report has been prepared in accordance with TII's Traffic & Transport Assessment Guidelines and it provides an onerous and robust assessment of the impact of the proposed development. The Analysis/Assessment includes the traffic associated with adjacent relevant committed/permitted developments (ABP309152-21 & ABP308670-20, being the Primary Care Centre and the Mixed-use Development at the former Blarney Park Hotel)

7.2 This report demonstrates that the proposed development will have an unnoticeable impact upon the established local traffic conditions and can easily be accommodated on the road network.

7.3 It is proposed to provide vehicular access to the site via a well designed priority junction onto the established Sunberry Heights, with fully compliant and safe sightlines.

7.4 A review of the Road Safety Authority database records indicates that there is no significant history of accidents that would be affected by the level of additional traffic. In this regard, given the very low additional traffic volumes, we conclude that the development will not have any adverse impact upon traffic safety.

7.5 The assessment includes a Preliminary Mobility Management Plan (MMP or Travel Plan) for the site which is included as a separate report as ***Appendix E.*** We have also prepared a Statement of Consistency with DMURS and confirm that the internal layout is compliant with the requirements of DMURS and this is included and appended as ***Appendix F***. An independent Road Safety Audit of the Access Design and internal layout including the Designer Feedback Form is included as ***Appendix G***. A Bus Service & Bus Capacity Assessment has been undertaken and is included as ***Appendix H*** to this Report, and this confirms the adequacy of existing services.

7.6 We have assessed the site accessibility in terms of current and proposed cycle and pedestrian infrastructure and we can confirm that the site is perfectly located to benefit from same, particularly with the enhancements to Sunberry Heights providing improved accessibility to the local network of pedestrian and cyclists facilities. There are continuous safe pedestrian footpaths in place linking the site and the local schools.

7.7 It is considered that there are no significant Operational Traffic Safety or Road Capacity issues, affecting the development, the proposed vehicular access or the established road network, that prevent a positive determination of the application by An Bord Pleanála.

APPENDICES - CONTENT

A	Proposed Development – Layout & Access Arrangement
B	TRICS Trip Generation Output (Residential Housing, Apartments & Creche)
C	Traffic Surveys, Trip Distribution & Network Traffic Flow Diagrams
D	PiCADY Junction Simulation Model Output – Improved Sunberry Hts Junction
E	Preliminary Mobility Management Plan (Travel Plan)
F	DMURS Statement of Consistency
G	Independent Stage 1 Road Safety Audit & Designer Feedback Form
H	Bus Services & Capacity Assessment Report

APPENDIX A

Proposed Development
Layout & Access Arrangement

NRB Consulting Engineers Ltd recommend that Road and land ownership boundaries are verified through Legal & Land searches by the Client.

This drawing is based upon drawing 21_001_PA_R3, received 25/08/21. NRB Consulting Engineers Ltd shall not be liable for any inaccuracies or deficiencies.

REV	DATE	AMENDMENTS	DRAWN	CHK	APP

NRB Consulting Engineers Ltd
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Dundrum Road
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Phone/Fax: +353 1 292 1941
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Web: www.nrb.ie
Registered in Ireland No. 491679

Client

Project: Blarney Housing, Cork

Title: Proposed Site Layout

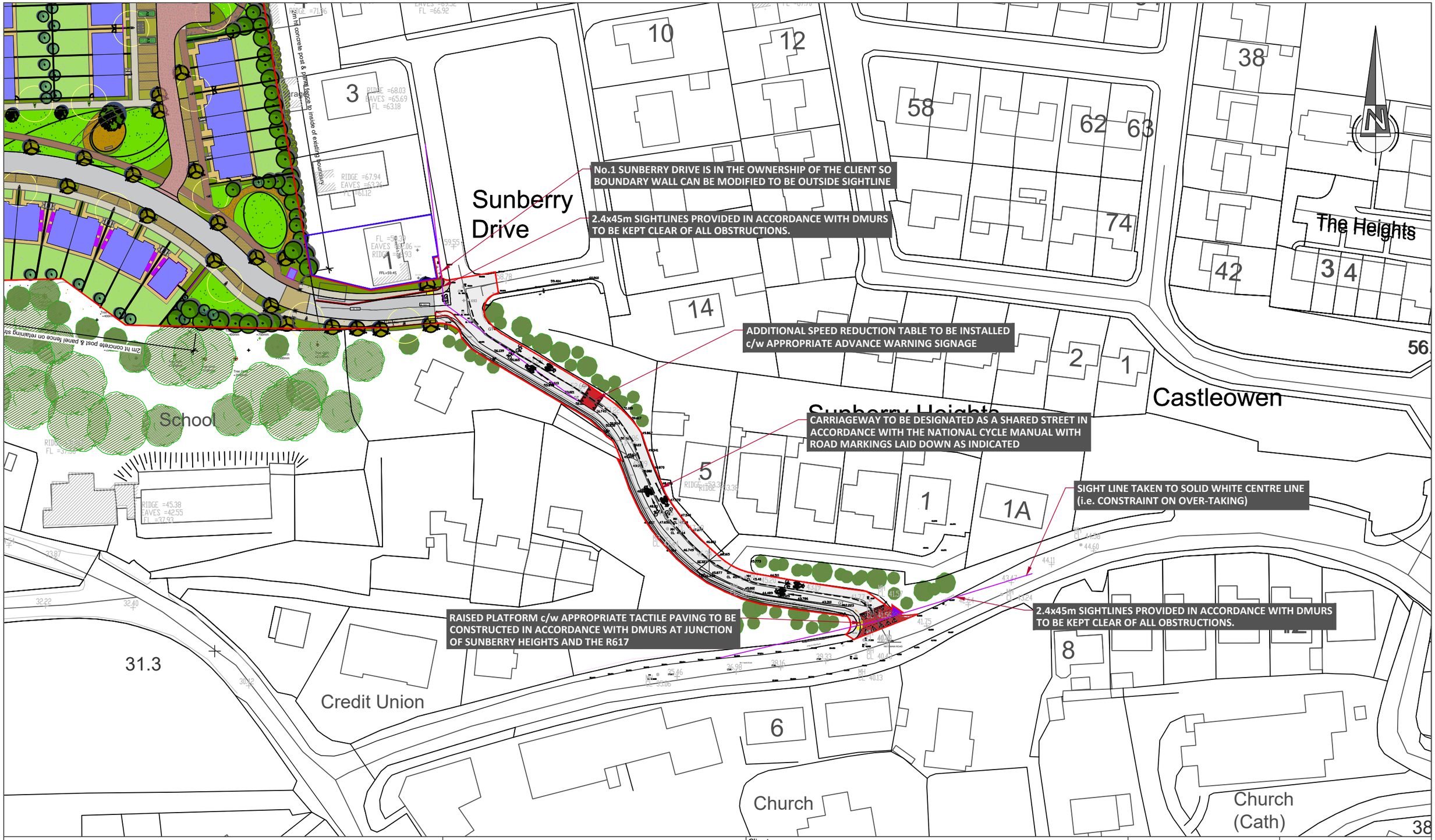
NRB Consulting Engineers Ltd accept no responsibility for any unauthorised amendments to this drawing. Only figured dimensions to be worked to.

Project No.	Drawing No.
17-052	NRB-TA-001

Drawn	Checked	Approved
PB	ER 25/08/21	ER 25/08/21

Date	Scale @ A3	Rev
25-Aug-21	1:1000	A

Purpose of Issue: ☐ Draft ☐ Information ☐ Approval ☐ As Built ☐ Tender ☐ Construction



NRB Consulting Engineers Ltd recommend that Road and land ownership boundaries are verified through Legal & Land searches by the Client.

This drawing is based upon drawing 21_001_PA_R3, received 25/08/21. NRB Consulting Engineers Ltd shall not be liable for any inaccuracies or deficiencies.

REV	DATE	AMENDMENTS	DRAWN	CHK	APP

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Registered in Ireland No. 491679

Client		Project No. 17-052	Drawing No. NRB-TA-002
Project	Blarney Housing Cork	Drawn PB	Checked ER 25/08/21
			Approved ER 25/08/21
Title	Proposed Site Access Modifications	Date 25-Aug-21	Scale @ A3 1:1000
			Rev A

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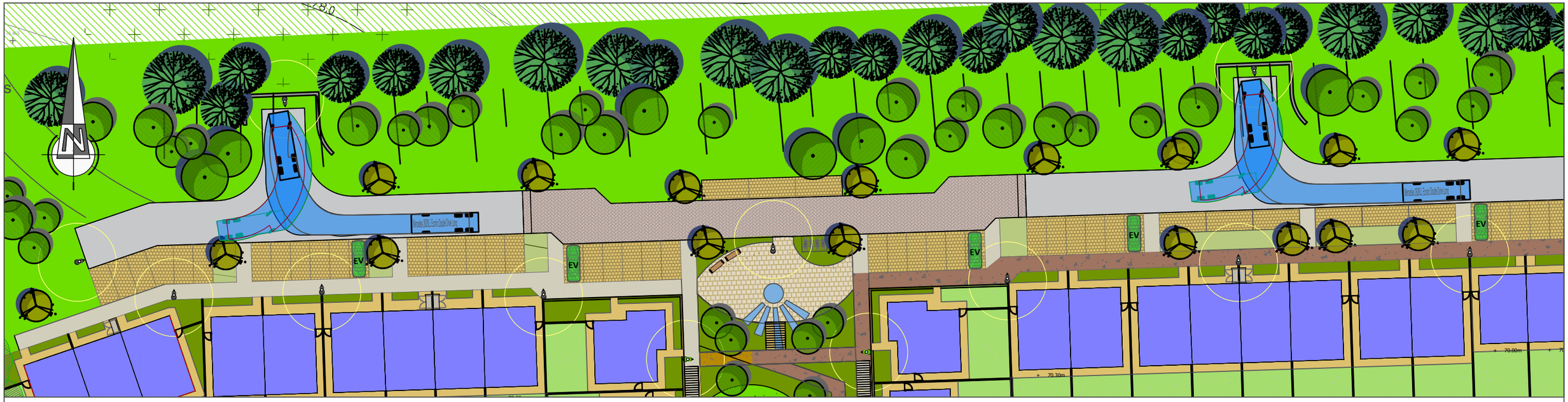
Purpose of Issue: ☐ Draft ☐ As Built ☐ Information ☐ Tender ☐ Approval ☐ Construction



AUTOTRACKS OF 2No. NORTHERN TURNING HEADS

AUTOTRACKS OF 2No. SOUTHERN TURNING HEADS

NRB Consulting Engineers Ltd recommend that Road and land ownership boundaries are verified through Legal & Land searches by the Client.

This drawing is based upon drawing 21_001_PA_R3, received 25/08/21. NRB Consulting Engineers Ltd shall not be liable for any inaccuracies or deficiencies.

REV	DATE	AMENDMENTS	DRAWN	CHK	APP

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Phone/Fax: +353 1 292 1941
Email: info@nrb.ie
Web: www.nrb.ie
Registered in Ireland No. 491679

Client

Project: Blarney Housing, Cork

Title: AutoTRACKs of a Medium Sized Refuse Vehicle at Internal Turning Heads 1 of 2

NRB Consulting Engineers Ltd accept no responsibility for any unauthorised amendments to this drawing. Only figured dimensions to be worked to.

Project No.	Drawing No.
17-052	NRB-TA-003

Drawn	Checked	Approved
PB	ER 25/08/21	ER 25/08/21

Date	Scale @ A3	Rev
25-Aug-21	1:500	A

Purpose of Issue: ☐ Draft ☐ As Built ☐ Information ☐ Tender ☐ Approval ☐ Construction

AUTOTRACKS OF 2No. EASTERN TURNING HEADS

NRB Consulting Engineers Ltd recommend that Road and land ownership boundaries are verified through Legal & Land searches by the Client.

This drawing is based upon drawing 21_001_PA_R3, received 25/08/21. NRB Consulting Engineers Ltd shall not be liable for any inaccuracies or deficiencies.

REV	DATE	AMENDMENTS	DRAWN	CHK	APP

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NRB consulting engineers

Client		Project No. 17-052	Drawing No. NRB-TA-004
Project	Blarney Housing Cork	Drawn PB / Checked ER 25/08/21	Approved ER 25/08/21
Title	AutoTRACKs of a Medium Sized Refuse Vehicle at Internal Turning Heads 2 of 2	Date 25-Aug-21	Scale @ A3 1:500 / Rev A

NRB Consulting Engineers Ltd accept no responsibility for any unauthorised amendments to this drawing. Only figured dimensions to be worked to.

Purpose of Issue: ☐ Draft ☐ Information ☐ Approval ☐ As Built ☐ Tender ☐ Construction

NRB Consulting Engineers Ltd recommend that Road and land ownership boundaries are verified through Legal & Land searches by the Client.

This drawing is based upon drawing 21_001_PA_R3, received 25/08/21. NRB Consulting Engineers Ltd shall not be liable for any inaccuracies or deficiencies.

REV	DATE	AMENDMENTS	DRAWN	CHK	APP

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NRB consulting engineers

Client

Project: Blarney Housing, Cork

Title: Internal Junction Sightlines

NRB Consulting Engineers Ltd accept no responsibility for any unauthorised amendments to this drawing. Only figured dimensions to be worked to.

Project No.	Drawing No.
17-052	NRB-TA-005

Drawn	Checked	Approved
PB	ER 25/08/21	ER 25/08/21

Date	Scale @ A3	Rev
25-Aug-21	1:500	A

Purpose of Issue: ☐ Draft ☐ Information ☐ Approval ☐ As Built ☐ Tender ☐ Construction

APPENDIX B

TRICS Traffic Generation Output
(Residential Housing, Apartments & Creche)

Calculation Reference: AUDIT-160301-210326-0336

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
Category : A - HOUSES PRIVATELY OWNED
TOTAL VEHICLES

Selected regions and areas:

03	SOUTH WEST		
	DC	DORSET	1 days
	DV	DEVON	3 days
	SM	SOMERSET	3 days
	WL	WILTSHIRE	1 days
04	EAST ANGLIA		
	CA	CAMBRIDGESHIRE	2 days
	NF	NORFOLK	11 days
	SF	SUFFOLK	5 days
05	EAST MIDLANDS		
	DS	DERBYSHIRE	1 days
	LE	LEICESTERSHIRE	1 days
	LN	LINCOLNSHIRE	2 days
06	WEST MIDLANDS		
	SH	SHROPSHIRE	2 days
	ST	STAFFORDSHIRE	3 days
	WK	WARWICKSHIRE	3 days
	WM	WEST MIDLANDS	2 days
07	YORKSHIRE & NORTH LINCOLNSHIRE		
	NE	NORTH EAST LINCOLNSHIRE	2 days
	NY	NORTH YORKSHIRE	6 days
	SY	SOUTH YORKSHIRE	3 days
	WY	WEST YORKSHIRE	1 days
08	NORTH WEST		
	CH	CHESHIRE	4 days
	GM	GREATER MANCHESTER	1 days
	LC	LANCASHIRE	2 days
	MS	MERSEYSIDE	1 days
09	NORTH		
	CB	CUMBRIA	1 days
	DH	DURHAM	3 days
	TW	TYNE & WEAR	2 days
10	WALES		
	PS	POWYS	2 days
	VG	VALE OF GLAMORGAN	1 days
11	SCOTLAND		
	AG	ANGUS	1 days
	FA	FALKIRK	2 days
	HI	HIGHLAND	1 days
12	CONNAUGHT		
	CS	SLIGO	2 days
	GA	GALWAY	1 days
	LT	LEITRIM	2 days
	RO	ROSCOMMON	2 days
13	MUNSTER		
	WA	WATERFORD	1 days
14	LEINSTER		
	CC	CARLOW	1 days
	WC	WICKLOW	2 days
	WX	WEXFORD	1 days
15	GREATER DUBLIN		
	DL	DUBLIN	2 days
16	ULSTER (REPUBLIC OF IRELAND)		
	CV	CAVAN	2 days
	DN	DONEGAL	5 days
17	ULSTER (NORTHERN IRELAND)		
	AN	ANTRIM	2 days
	DO	DOWN	1 days
	TY	TYRONE	1 days

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

Primary Filtering selection:

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

Parameter: No of Dwellings
Actual Range: 6 to 1817 (units:)
Range Selected by User: 4 to 1817 (units:)

Parking Spaces Range: All Surveys Included

Parking Spaces per Dwelling Range: All Surveys Included

Bedrooms per Dwelling Range: All Surveys Included

Percentage of dwellings privately owned: All Surveys Included

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/12 to 16/09/20

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

Selected survey days:

Monday	24 days
Tuesday	19 days
Wednesday	23 days
Thursday	17 days
Friday	15 days

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

Selected survey types:

Manual count	95 days
Directional ATC Count	3 days

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

Selected Locations:

Edge of Town Centre	12
Suburban Area (PPS6 Out of Centre)	30
Edge of Town	39
Neighbourhood Centre (PPS6 Local Centre)	17

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

Selected Location Sub Categories:

Industrial Zone	1
Residential Zone	74
Village	12
Out of Town	1
No Sub Category	10

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

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES 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	98	94	0.067	98	94	0.286	98	94	0.353
08:00 - 09:00	98	94	0.133	98	94	0.381	98	94	0.514
09:00 - 10:00	98	94	0.151	98	94	0.186	98	94	0.337
10:00 - 11:00	98	94	0.124	98	94	0.141	98	94	0.265
11:00 - 12:00	98	94	0.129	98	94	0.136	98	94	0.265
12:00 - 13:00	98	94	0.160	98	94	0.159	98	94	0.319
13:00 - 14:00	98	94	0.159	98	94	0.157	98	94	0.316
14:00 - 15:00	98	94	0.175	98	94	0.182	98	94	0.357
15:00 - 16:00	98	94	0.242	98	94	0.177	98	94	0.419
16:00 - 17:00	98	94	0.273	98	94	0.168	98	94	0.441
17:00 - 18:00	98	94	0.352	98	94	0.180	98	94	0.532
18:00 - 19:00	98	94	0.288	98	94	0.177	98	94	0.465
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			2.253			2.330			4.583

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.

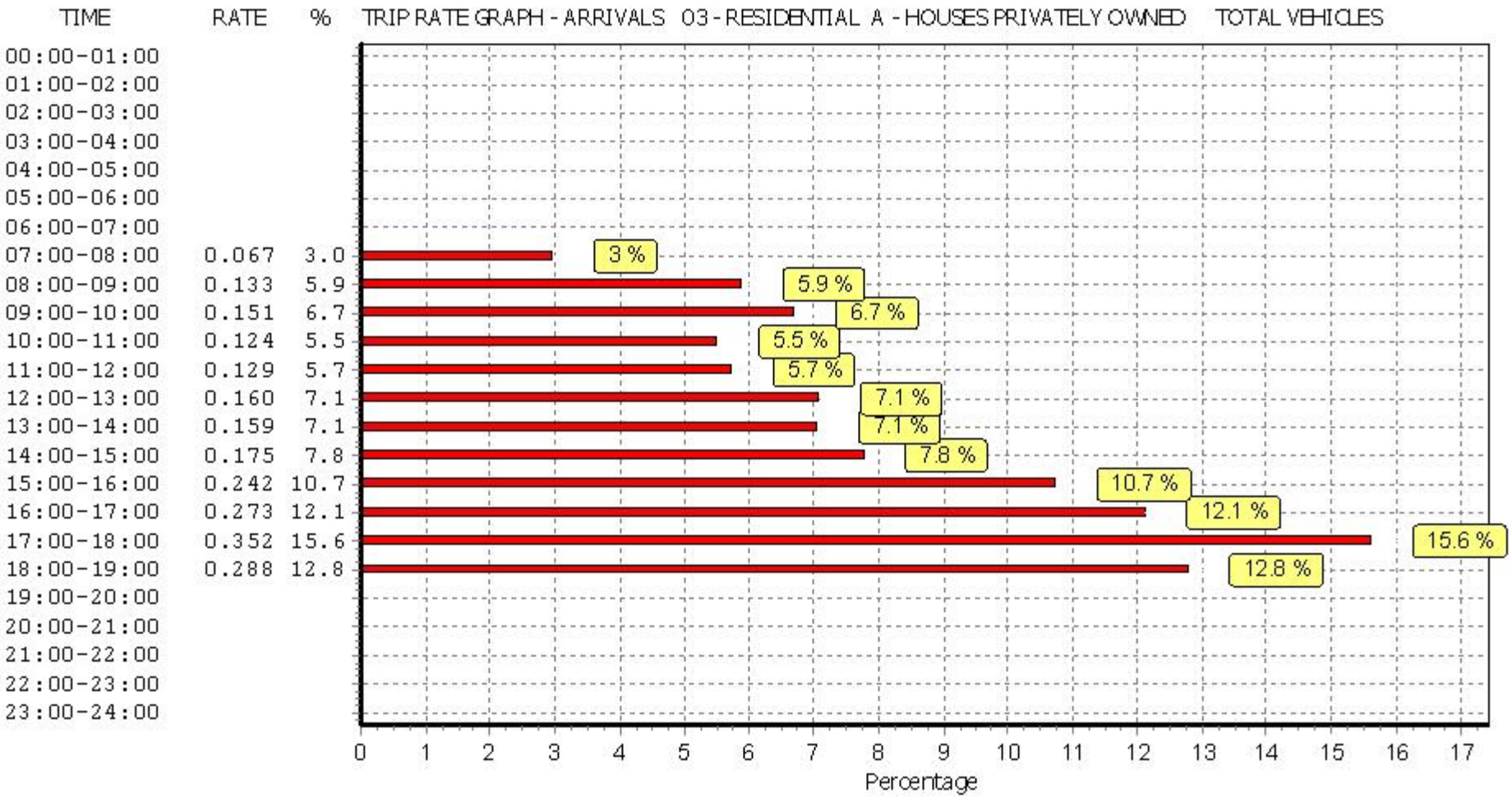
*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected 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:	6 - 1817 (units:)
Survey date date range:	01/01/12 - 16/09/20
Number of weekdays (Monday-Friday):	102
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	7
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.

NRB Consulting Engineers Ltd 8 Leopardstown Business Centre, Ballyogan Avenue Dublin 18 Licence No: 160301



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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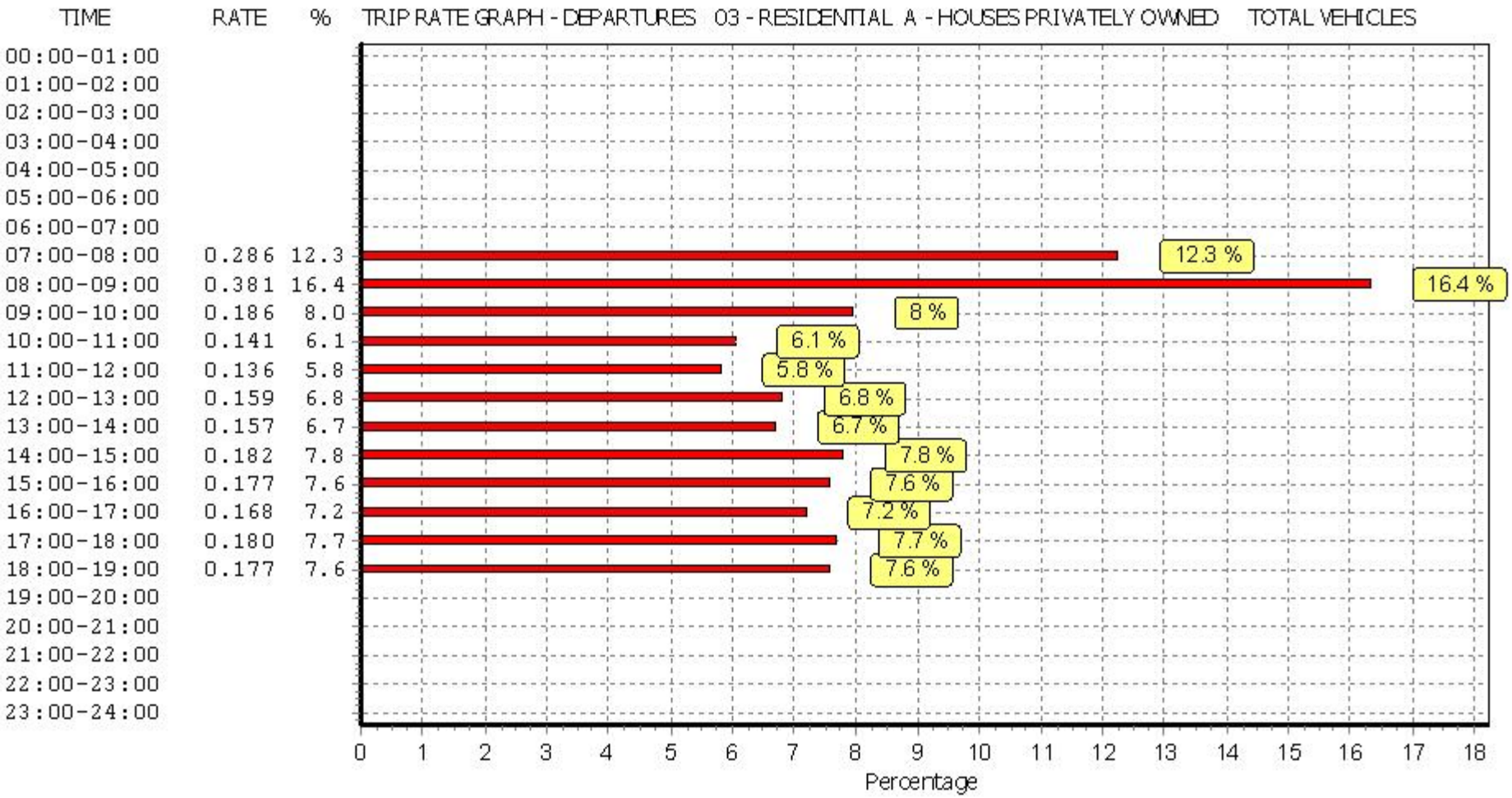

This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through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

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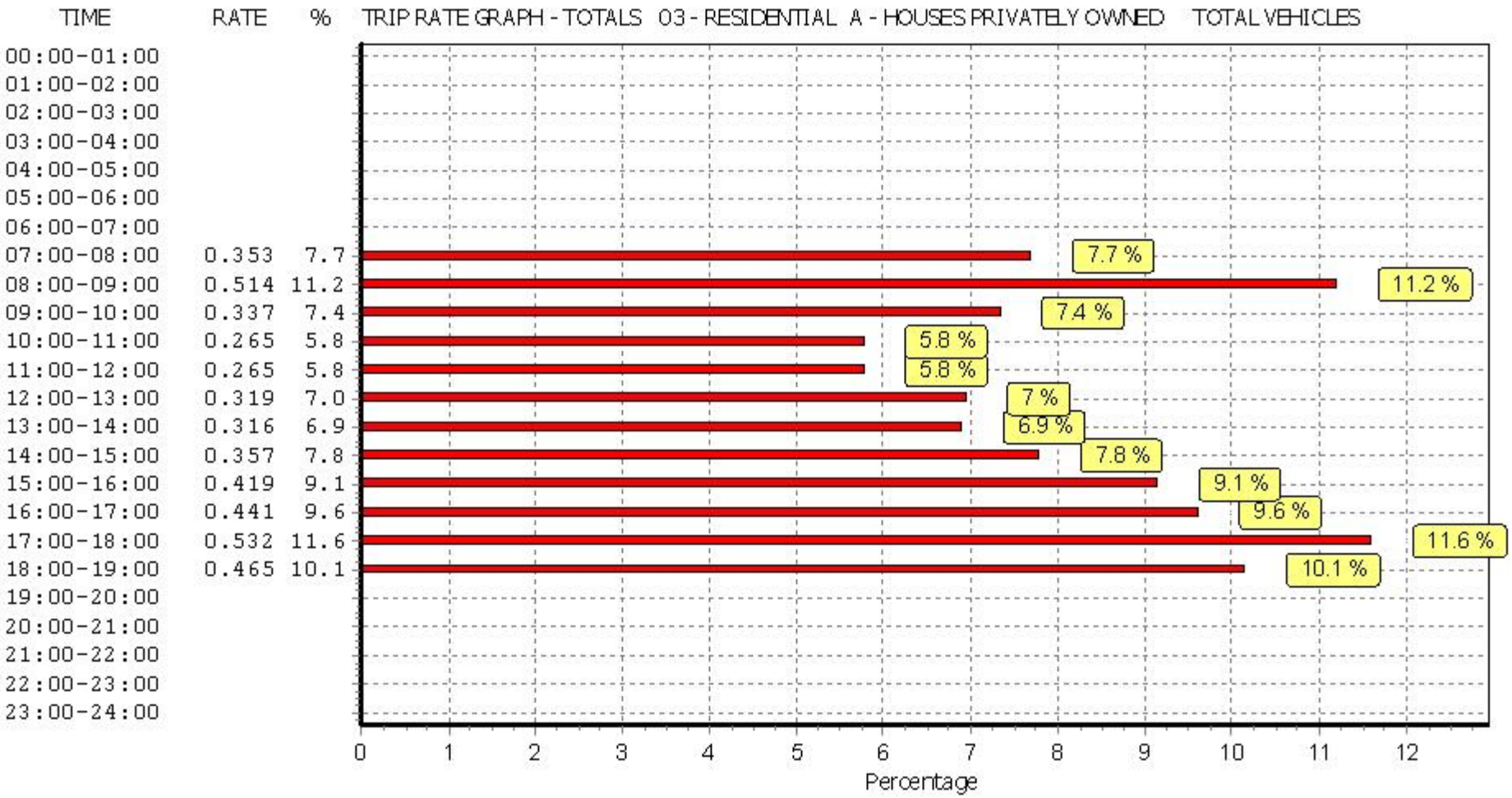


This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through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

Calculation Reference: AUDIT-160301-210326-0330

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	2 days
05	EAST MIDLANDS		
	DS	DERBYSHIRE	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	6 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	37	55	0.045	37	55	0.157	37	55	0.202
08:00 - 09:00	37	55	0.056	37	55	0.193	37	55	0.249
09:00 - 10:00	37	55	0.069	37	55	0.095	37	55	0.164
10:00 - 11:00	37	55	0.056	37	55	0.075	37	55	0.131
11:00 - 12:00	37	55	0.065	37	55	0.076	37	55	0.141
12:00 - 13:00	37	55	0.085	37	55	0.079	37	55	0.164
13:00 - 14:00	37	55	0.068	37	55	0.083	37	55	0.151
14:00 - 15:00	37	55	0.081	37	55	0.079	37	55	0.160
15:00 - 16:00	37	55	0.102	37	55	0.061	37	55	0.163
16:00 - 17:00	37	55	0.115	37	55	0.082	37	55	0.197
17:00 - 18:00	37	55	0.177	37	55	0.083	37	55	0.260
18:00 - 19:00	37	55	0.161	37	55	0.096	37	55	0.257
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.080			1.159			2.239

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.

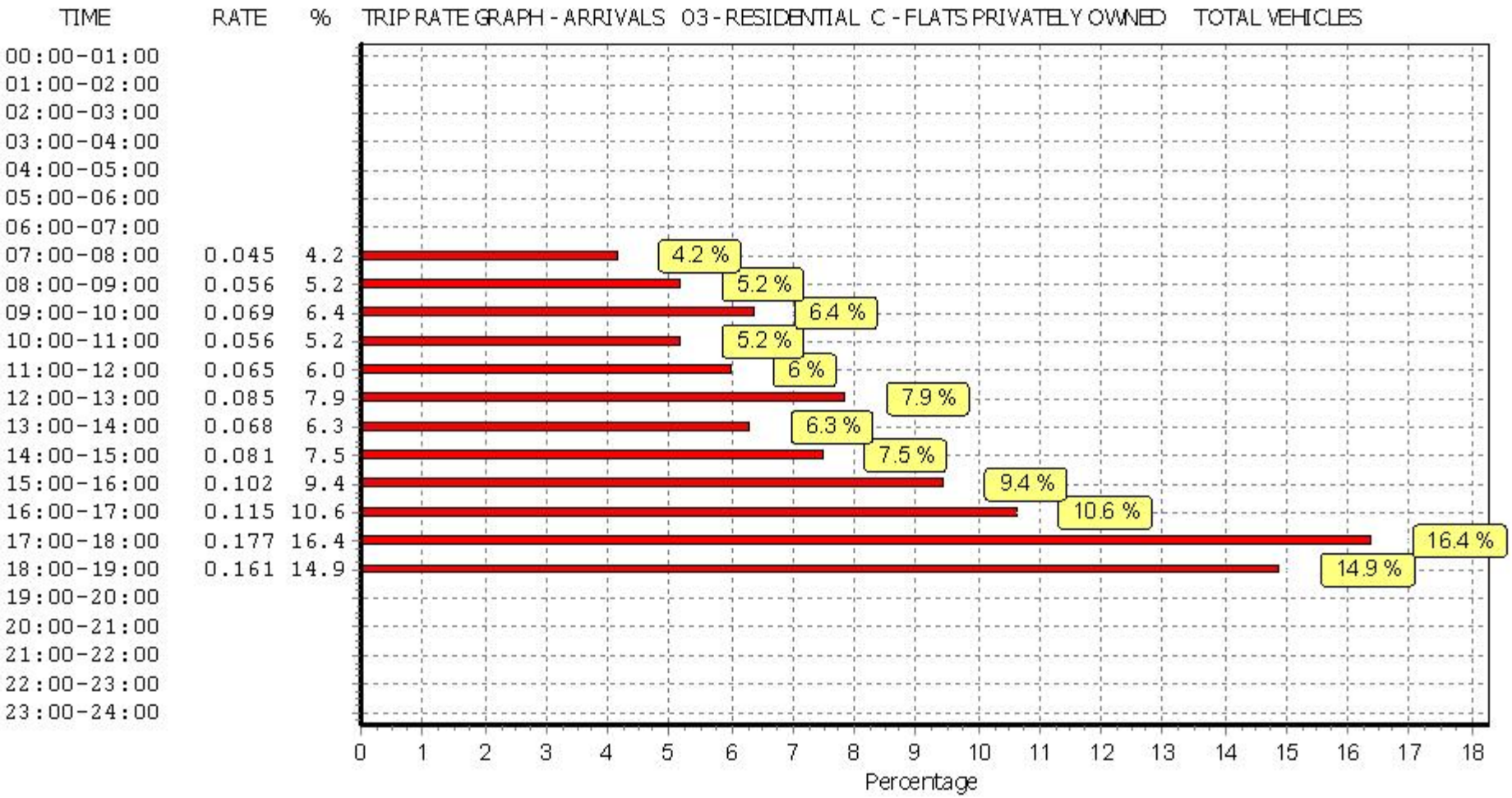
*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected 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 - 184 (units:)
Survey date date range:	01/01/12 - 08/09/20
Number of weekdays (Monday-Friday):	37
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.

NRB Consulting Engineers Ltd 8 Leopardstown Business Centre, Ballyogan Avenue Dublin 18 Licence No: 160301



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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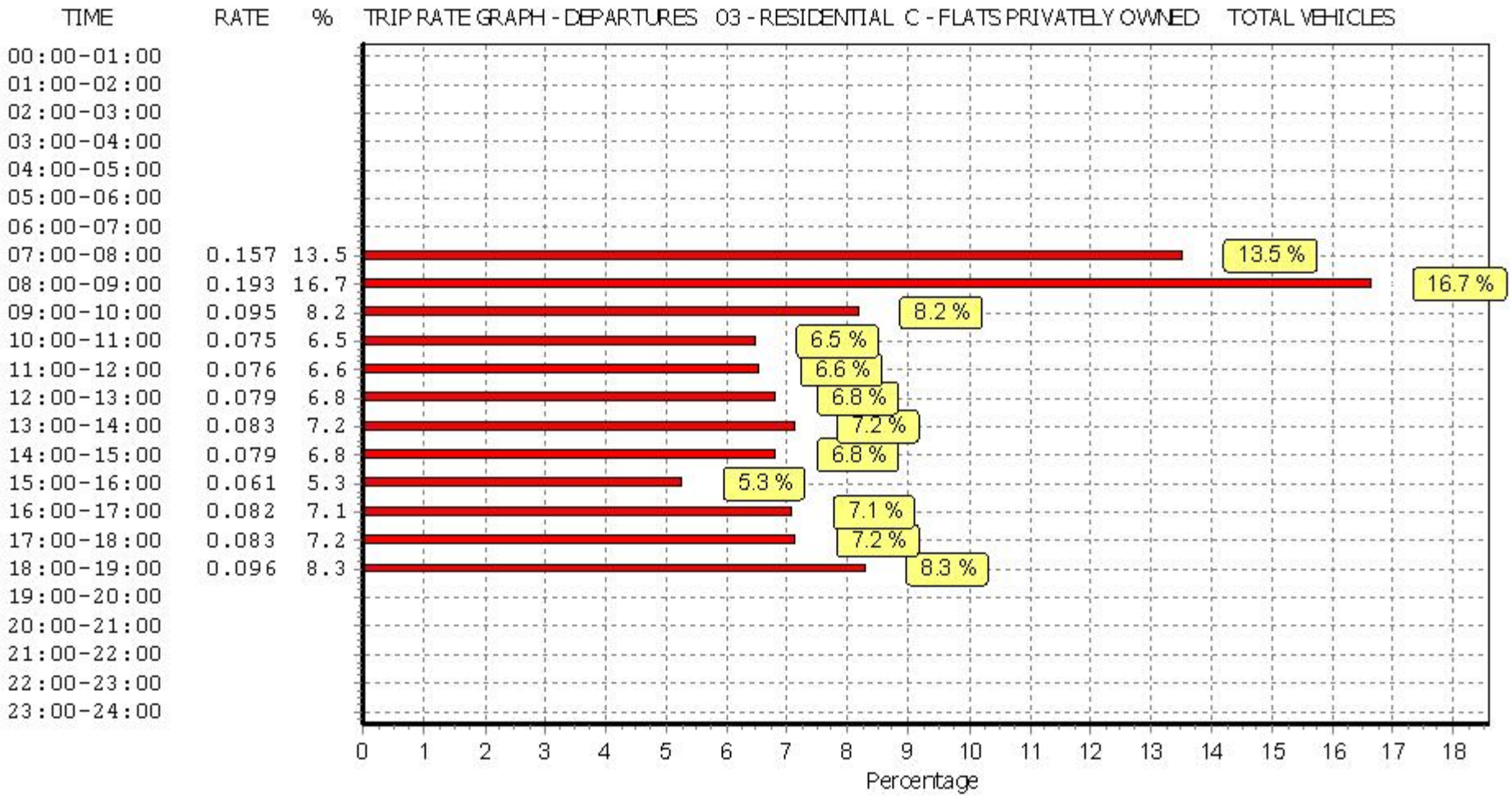

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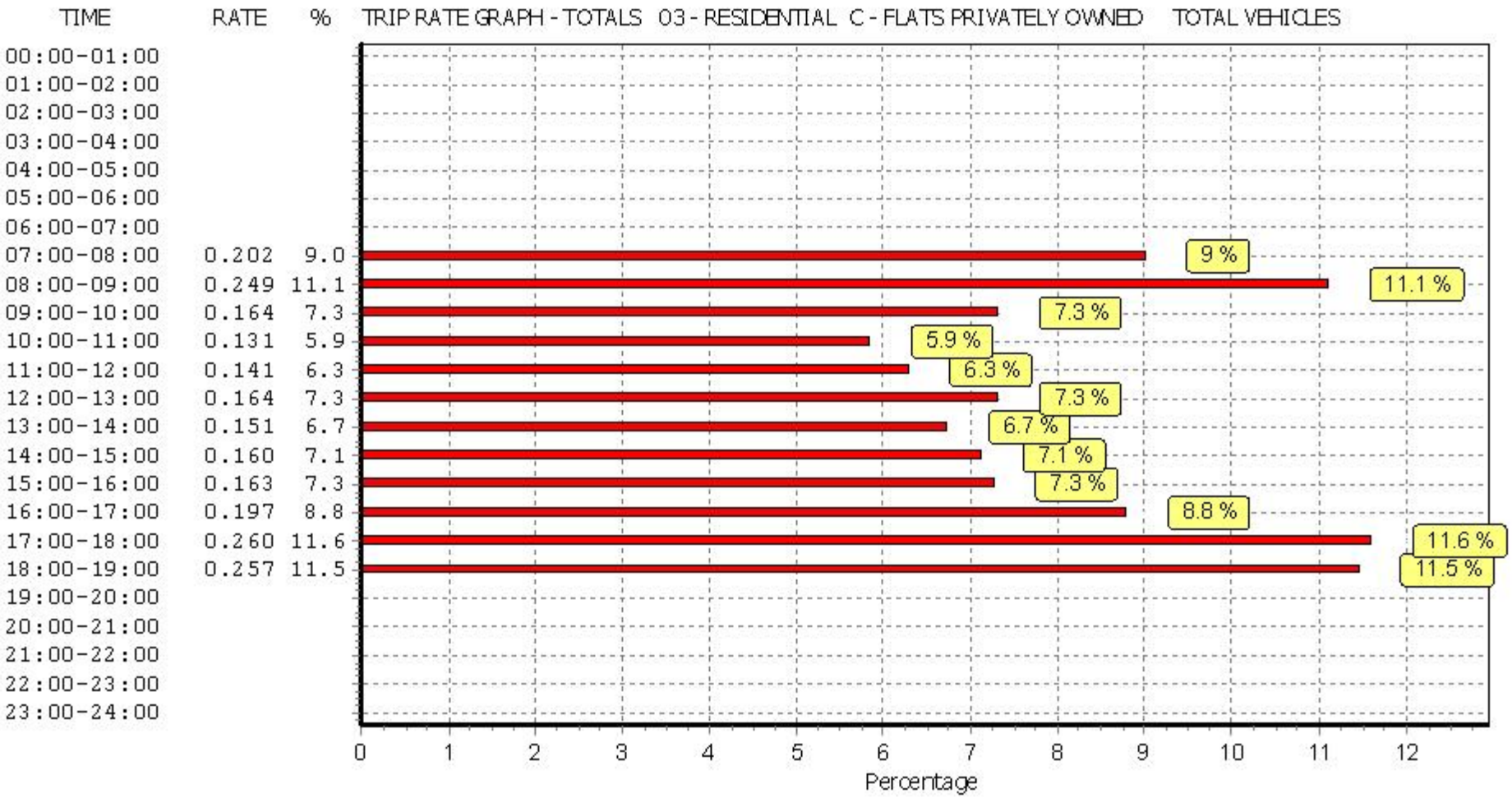

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Calculation Reference: AUDIT-160301-210408-0443

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 04 - EDUCATION
Category : D - NURSERY
TOTAL VEHICLES

Selected regions and areas:

03	SOUTH WEST		
	WL	WILTSHIRE	1 days
04	EAST ANGLIA		
	CA	CAMBRIDGESHIRE	1 days
	SF	SUFFOLK	1 days
05	EAST MIDLANDS		
	DS	DERBYSHIRE	1 days
	LE	LEICESTERSHIRE	1 days
	LN	LINCOLNSHIRE	1 days
06	WEST MIDLANDS		
	SH	SHROPSHIRE	1 days
	WK	WARWICKSHIRE	1 days
08	NORTH WEST		
	CH	CHESHIRE	1 days
09	NORTH		
	TV	TEES VALLEY	1 days
	TW	TYNE & WEAR	1 days
10	WALES		
	BG	BRIDGEND	1 days
	MM	MONMOUTHSHIRE	1 days
11	SCOTLAND		
	DU	DUNDEE CITY	1 days
	SR	STIRLING	1 days
12	CONNAUGHT		
	RO	ROSCOMMON	2 days

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

TRIP RATE for Land Use 04 - EDUCATION/D - NURSERY
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	1	400	0.000	1	400	0.000	1	400	0.000
07:00 - 08:00	17	455	1.926	17	455	0.827	17	455	2.753
08:00 - 09:00	17	455	3.568	17	455	2.857	17	455	6.425
09:00 - 10:00	17	455	1.849	17	455	1.732	17	455	3.581
10:00 - 11:00	17	455	0.569	17	455	0.427	17	455	0.996
11:00 - 12:00	17	455	0.763	17	455	0.530	17	455	1.293
12:00 - 13:00	17	455	1.513	17	455	1.642	17	455	3.155
13:00 - 14:00	17	455	0.905	17	455	1.435	17	455	2.340
14:00 - 15:00	17	455	0.711	17	455	0.685	17	455	1.396
15:00 - 16:00	17	455	0.672	17	455	0.944	17	455	1.616
16:00 - 17:00	17	455	1.590	17	455	1.719	17	455	3.309
17:00 - 18:00	17	455	2.521	17	455	3.154	17	455	5.675
18:00 - 19:00	16	474	0.145	16	474	0.751	16	474	0.896
19:00 - 20:00	1	400	0.000	1	400	0.000	1	400	0.000
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			16.732			16.703			33.435

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.

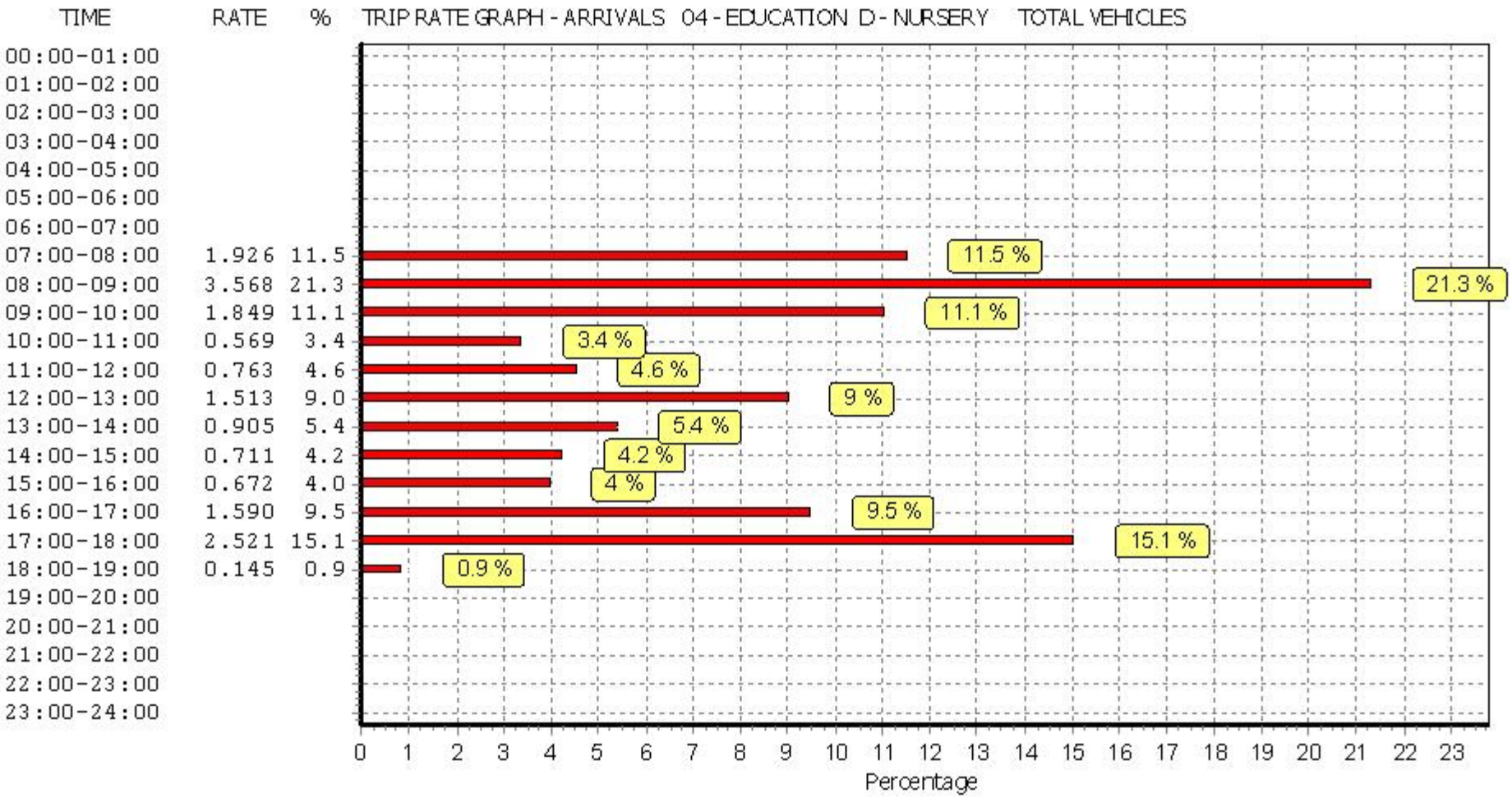
*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected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

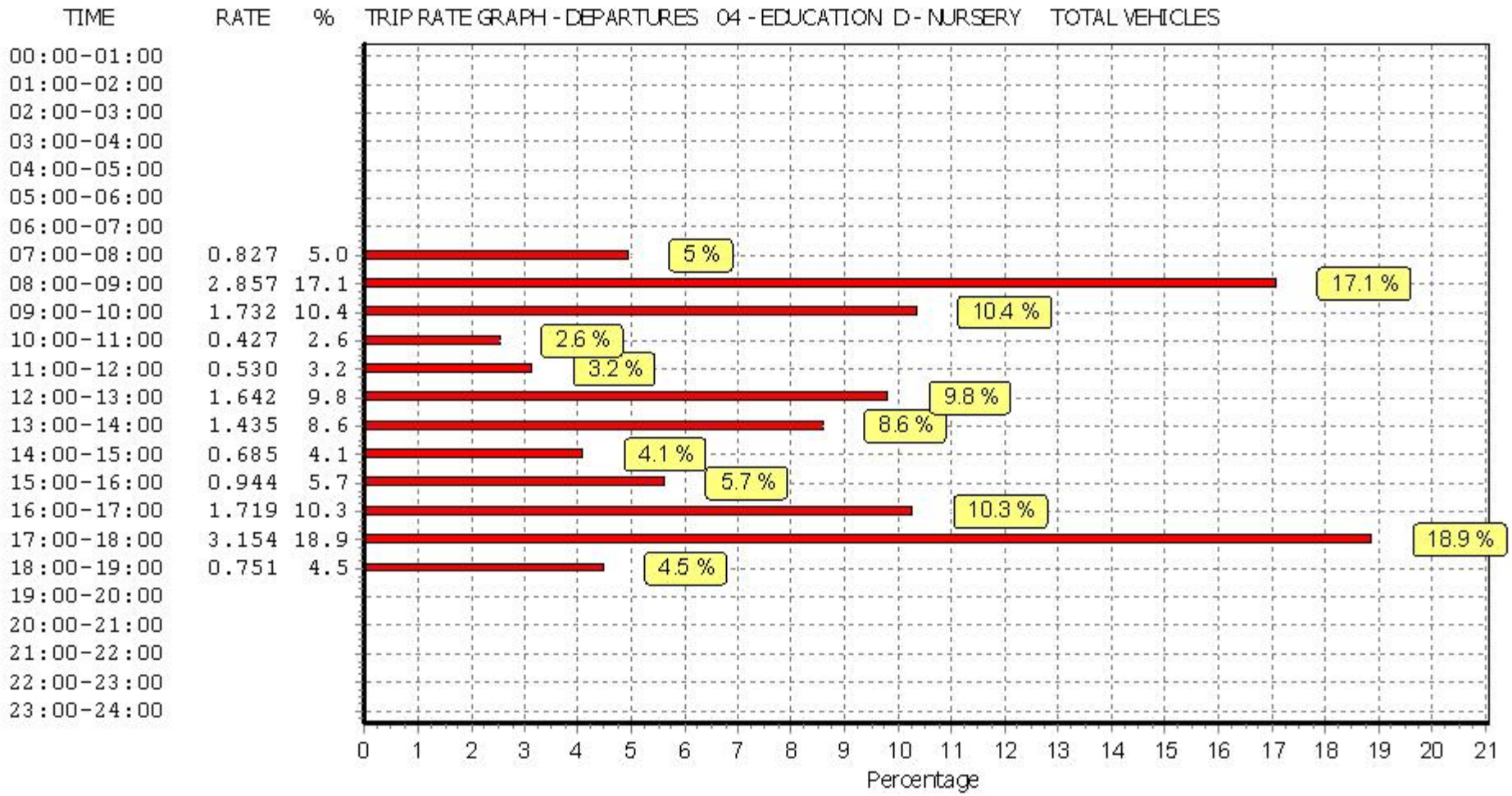
Trip rate parameter range selected:	150 - 860 (units: sqm)
Survey date date range:	01/01/13 - 27/09/19
Number of weekdays (Monday-Friday):	17
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

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.

NRB Consulting Engineers Ltd 8 Leopardstown Business Centre, Ballyogan Avenue Dublin 18 Licence No: 160301



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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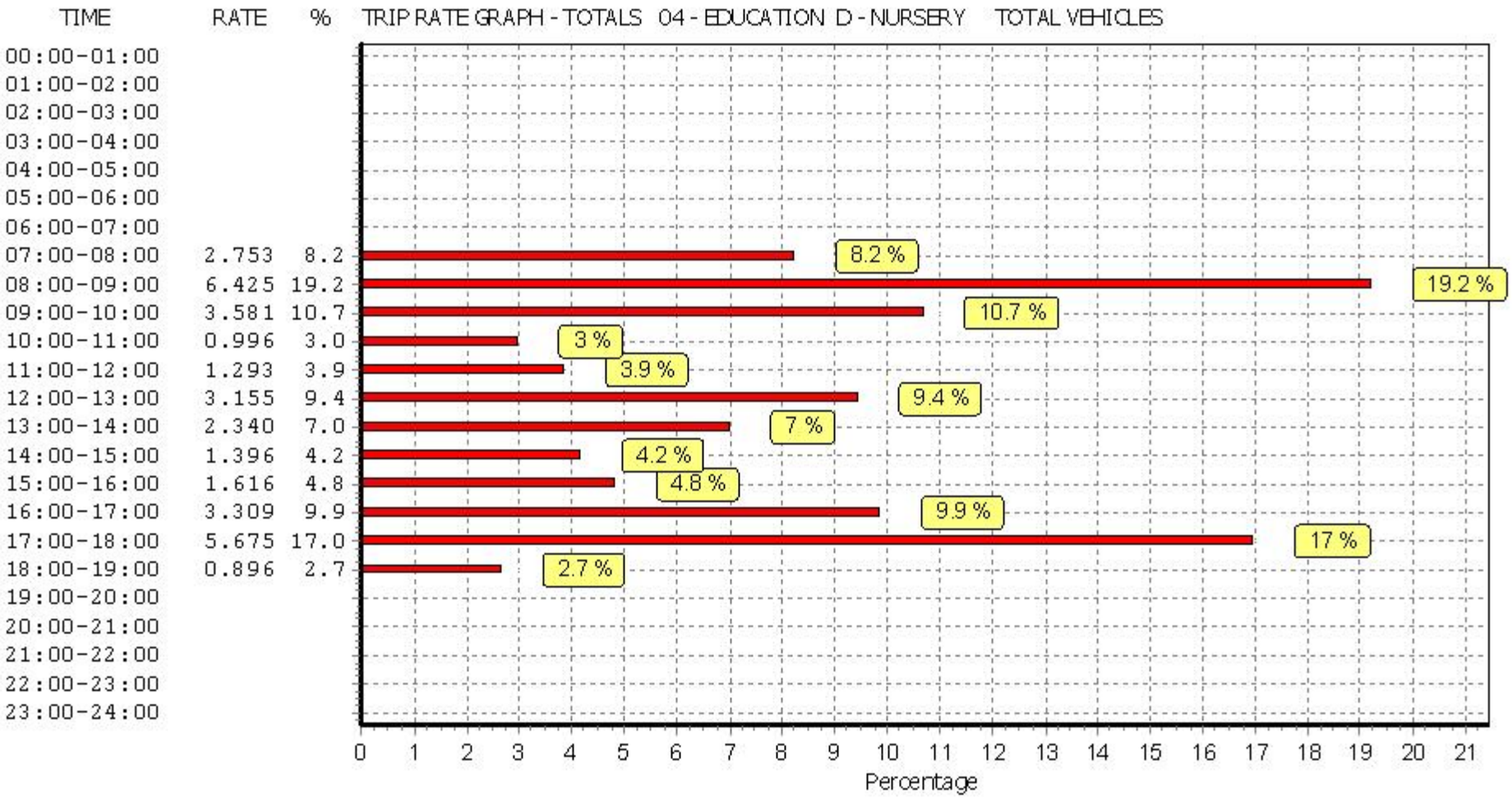

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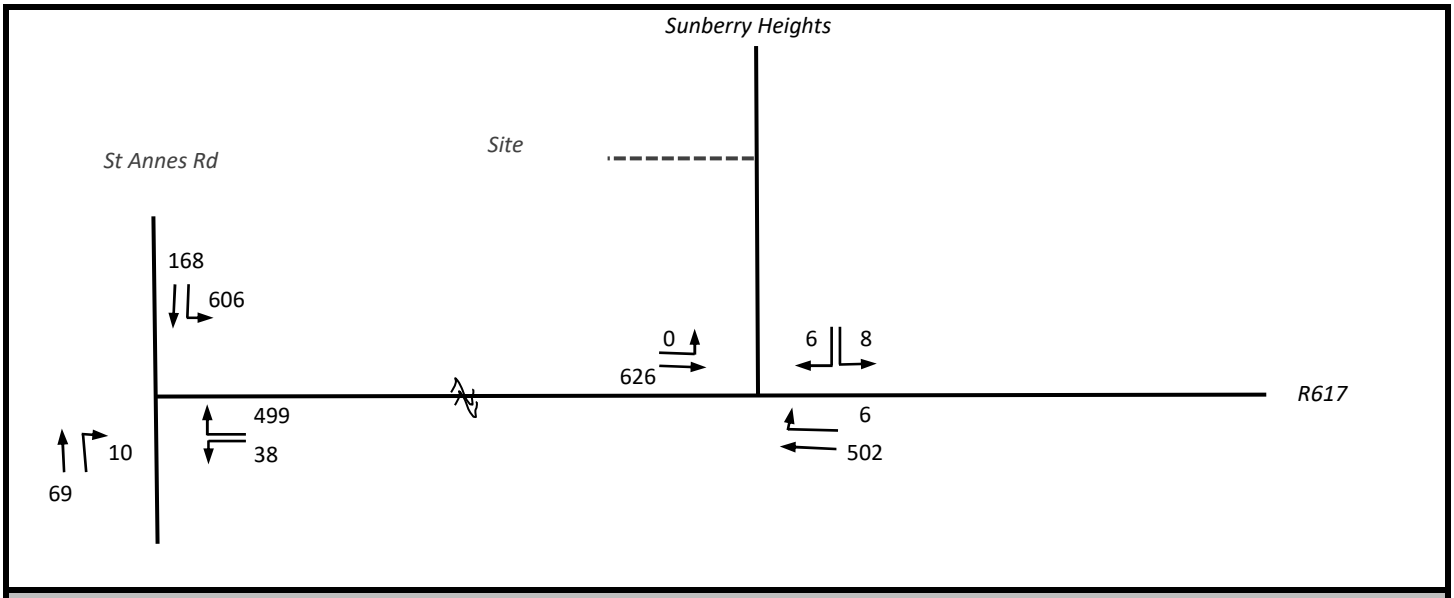
APPENDIX C

Traffic Surveys, Trip Distribution & Network Traffic Flow Projections & Diagrams



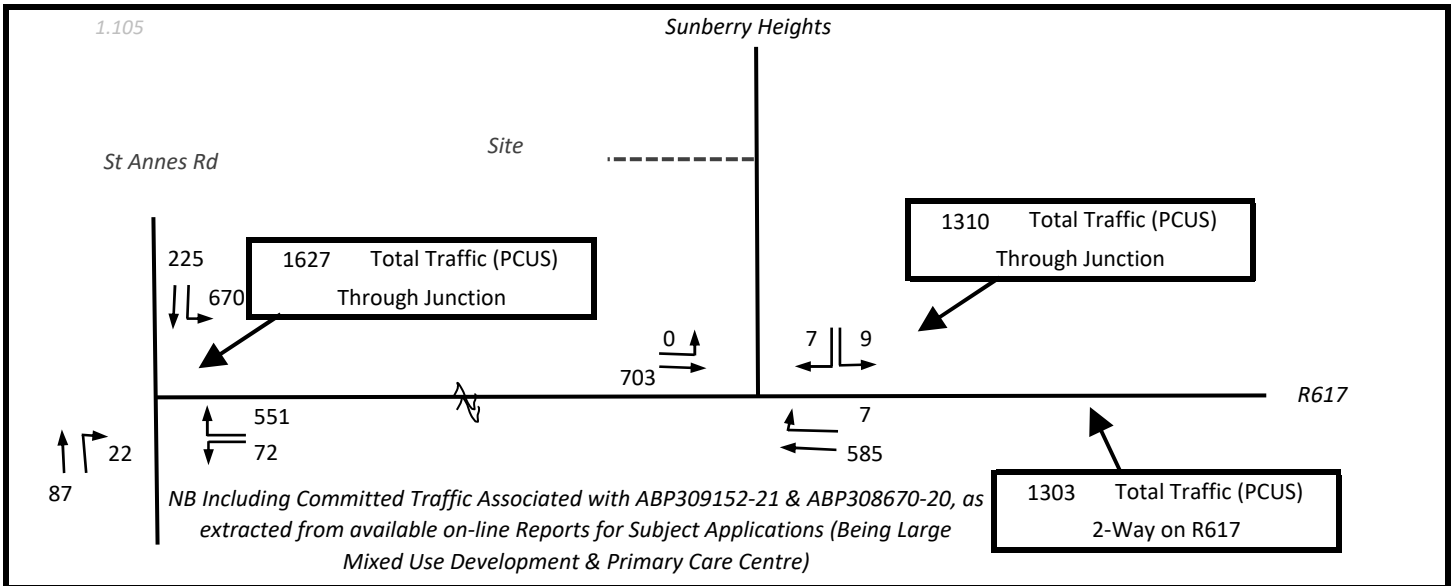
Existing Traffic Flow, Local Network
As Surveyed AM Peak Hour 8-9am
Without Any New Development (PCUs)

TII PE-PAG-02017 Project Appraisal Guidelines for National Roads Unit 5.3
(Travel Demand Projections 2019, Table 6.: Central Growth Rates: Annual Growth Factors - Metropolitan Cork)

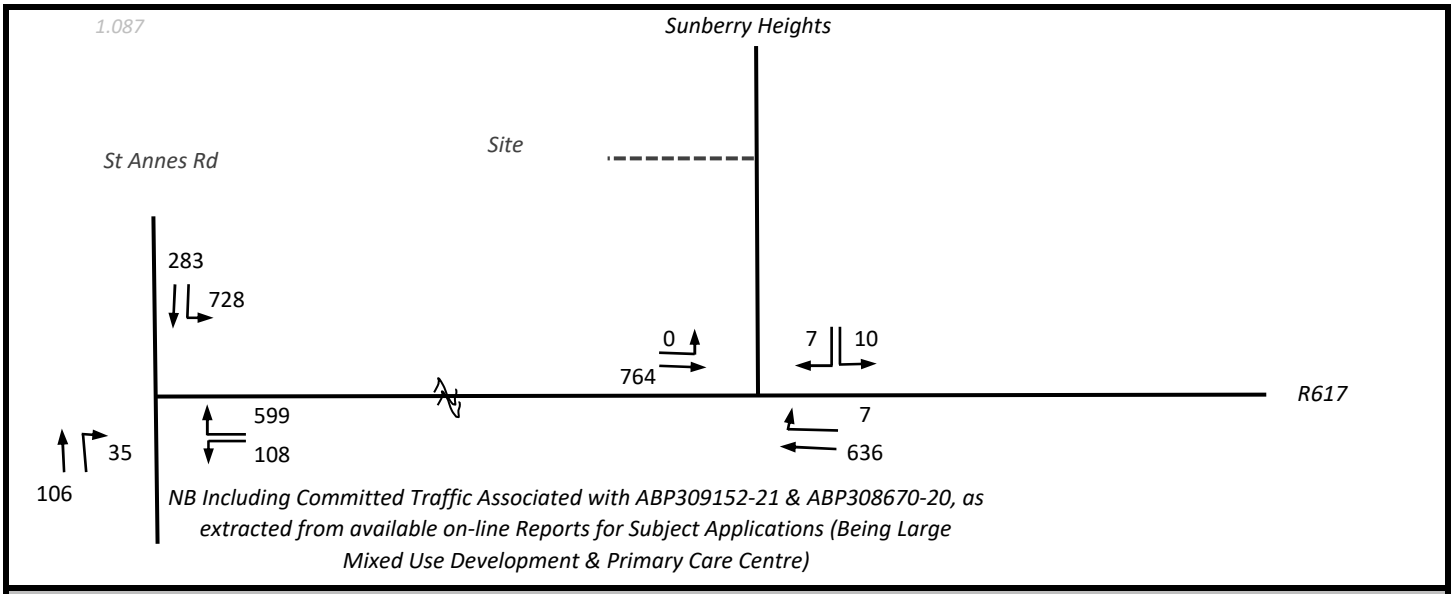
As Surveyed to Selected Opening 2024 = 1.105

Selected Opening Yr 2024 to Plus 5 Design Year 2029 = 1.087

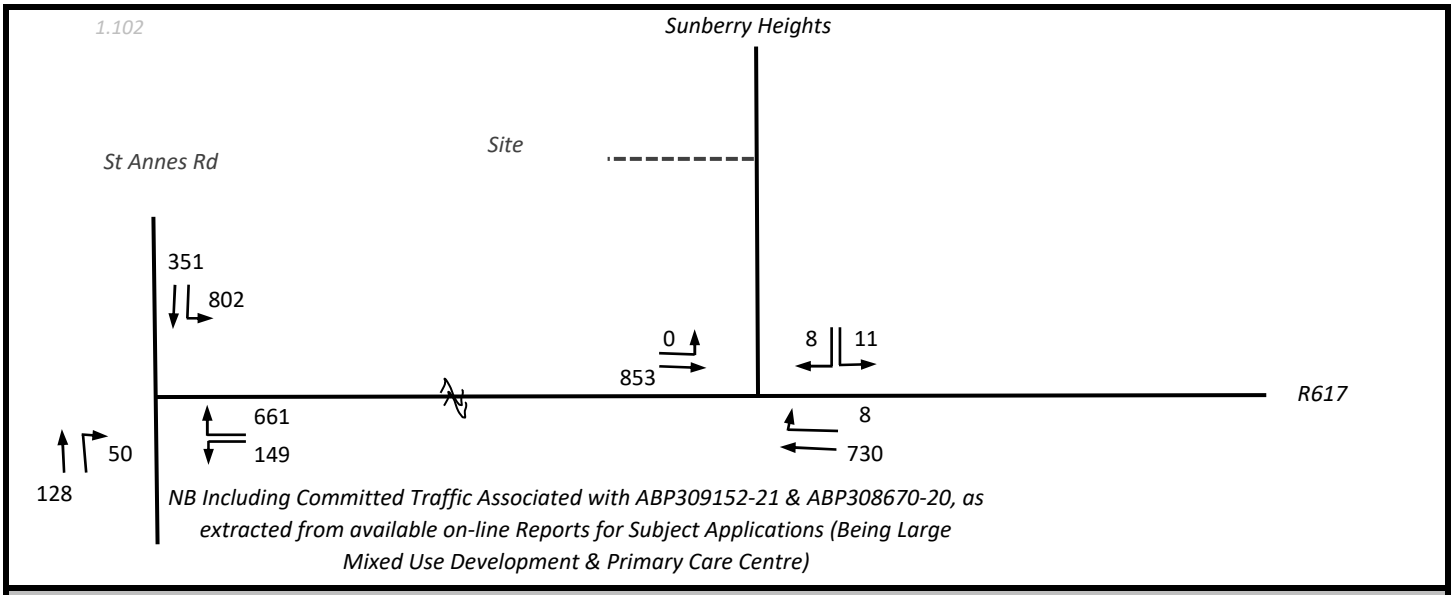
Plus 5 Design Year 2029 to Plus 15 Design Year 2039 = 1.102



Projected Traffic Flow, Local Network
AM Peak Hour 8-9am, 2024 Selected Opening Year
With Committed Development BUT Without Subject Development (PCUs)



Projected Traffic Flow, Local Network
AM Peak Hour 8-9am, 2029 ('Opening Plus 5' Design Year)
With Committed Development BUT Without Subject Development (PCUs)



Projected Traffic Flow, Local Network
AM Peak Hour 8-9am, 2039 ('Opening Plus 15' Design Year)
With Committed Development BUT Without Subject Development (PCUs)

REFER TO APPENDIX C FOR ASSOCIATED TRICS DATA OUTPUT

TRICS Assessment (Traffic Generation Calculations, 105 Residential Houses)

105 Houses	Arrivals		Departures		Total 2-Way Traffic Generated
Network Hour	Per Unit	107 Units	Per Unit	107 Units	
Weekday AM Peak	0.133	14	0.381	40	54
Weekday PM Peak	0.352	37	0.180	19	56

TRICS Assessment (Traffic Generation Calculations, 38 Residential Apartments)

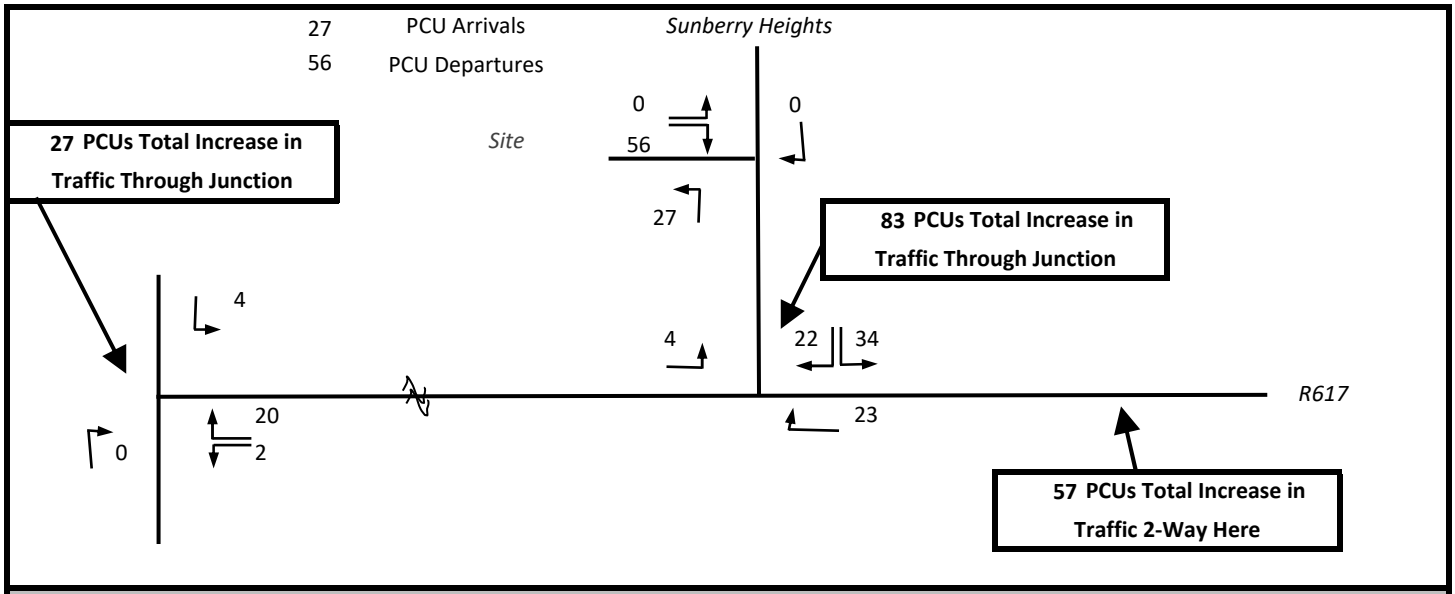
38 Apartments	Arrivals		Departures		Total 2-Way Traffic Generated
Network Hour	Per Unit	38 Units	Per Unit	38 Units	
Weekday AM Peak	0.056	2	0.193	7	9
Weekday PM Peak	0.177	7	0.083	3	10

TRICS Assessment (310m2 Creche Element)

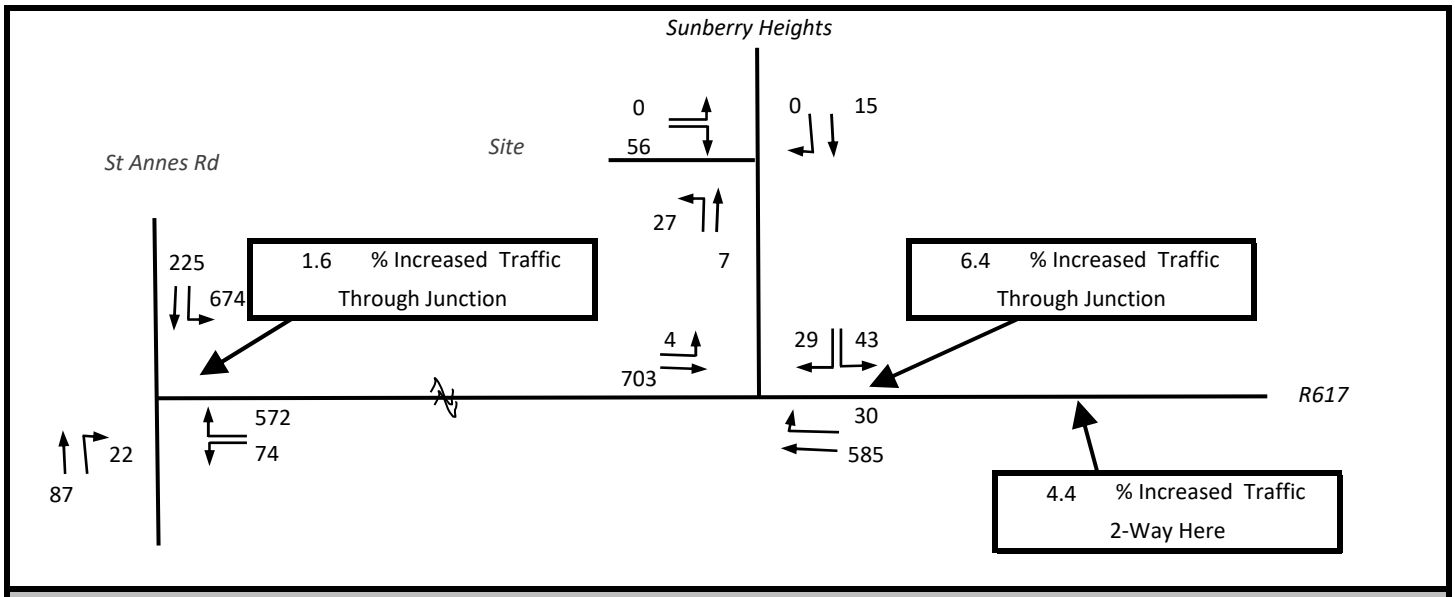
310 GFA (m2)	Arrivals		Departures		Total 2-Way Traffic Generated
Network Hour	Per Unit	Development	Per Unit	Development	
Weekday AM Peak	3.568	11	2.857	9	20
Weekday PM Peak	2.521	8	3.154	10	18

TOTAL TRAFFIC GENERATED COMPLETED APARTMENTS, HOUSING AND CRECHE (PCUs)

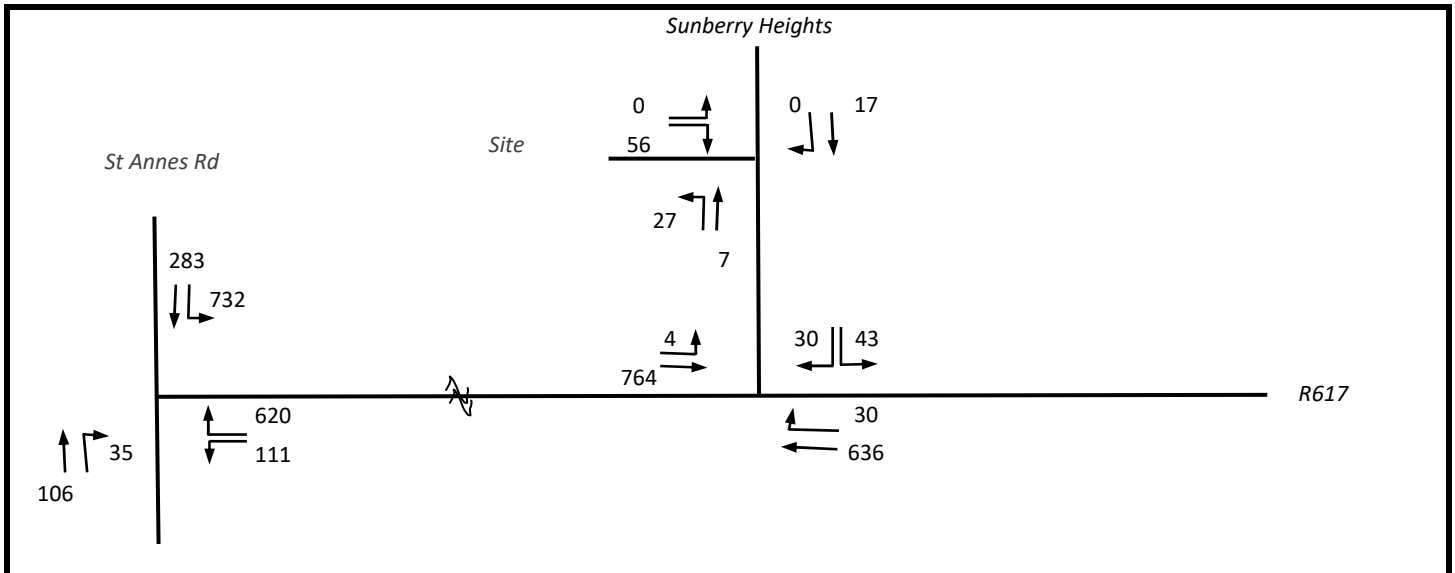
Network Period	Arrivals	Departures	Total 2-Way Traffic Generated
Weekday AM Peak	27	56	83
Weekday PM Peak	52	32	84



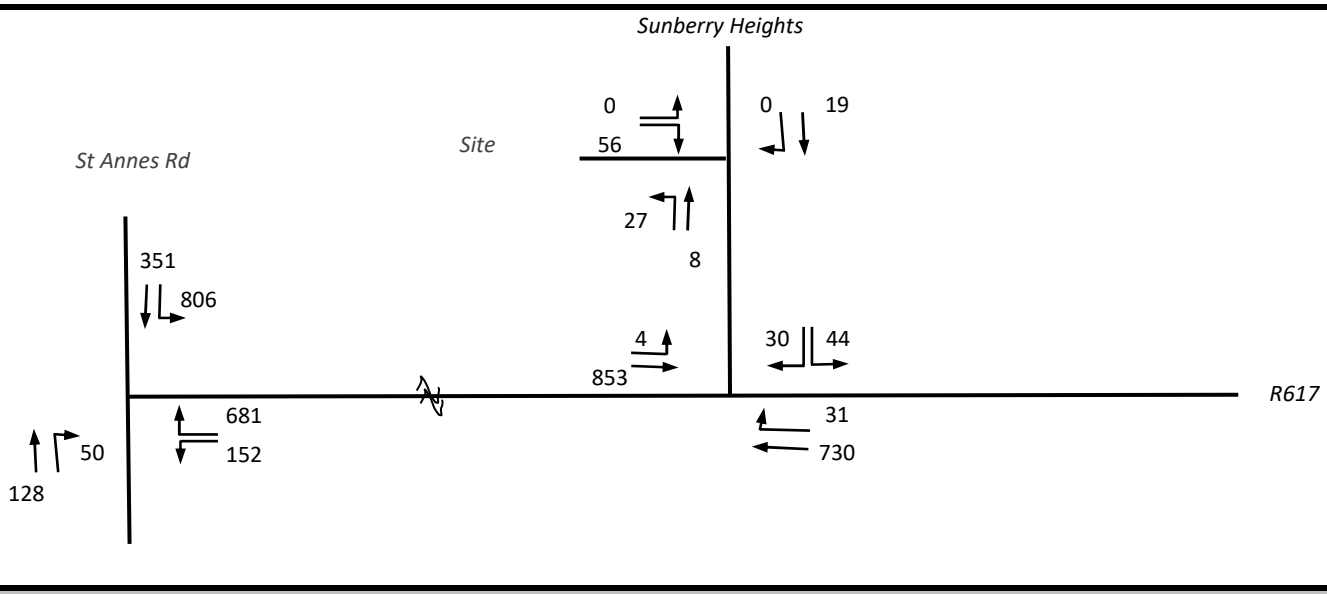
Assignment of Proposed Development Traffic to Local Roads - AM Peak Hour (8am to 9am)



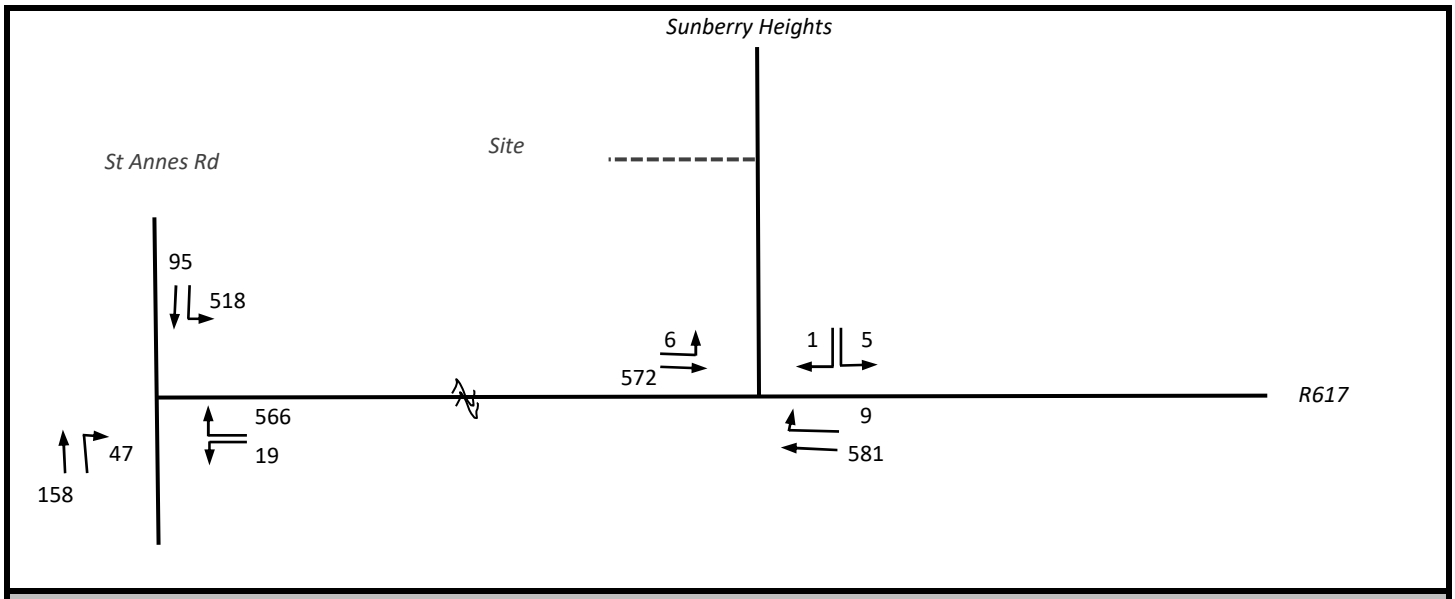
Projected Traffic Flow, Local Network
AM Peak Hour 8-9am, 2024 Selected Opening Year
WITH Committed AND Subject Development (PCUs)



Projected Traffic Flow, Local Network
AM Peak Hour 8-9am, 2029 'Opening Plus 5 Design Year'
WITH Committed AND Subject Development (PCUs)



Projected Traffic Flow, Local Network
AM Peak Hour 8-9am, 2039 'Opening Plus 15 Design Year'
WITH Committed AND Subject Development (PCUs)



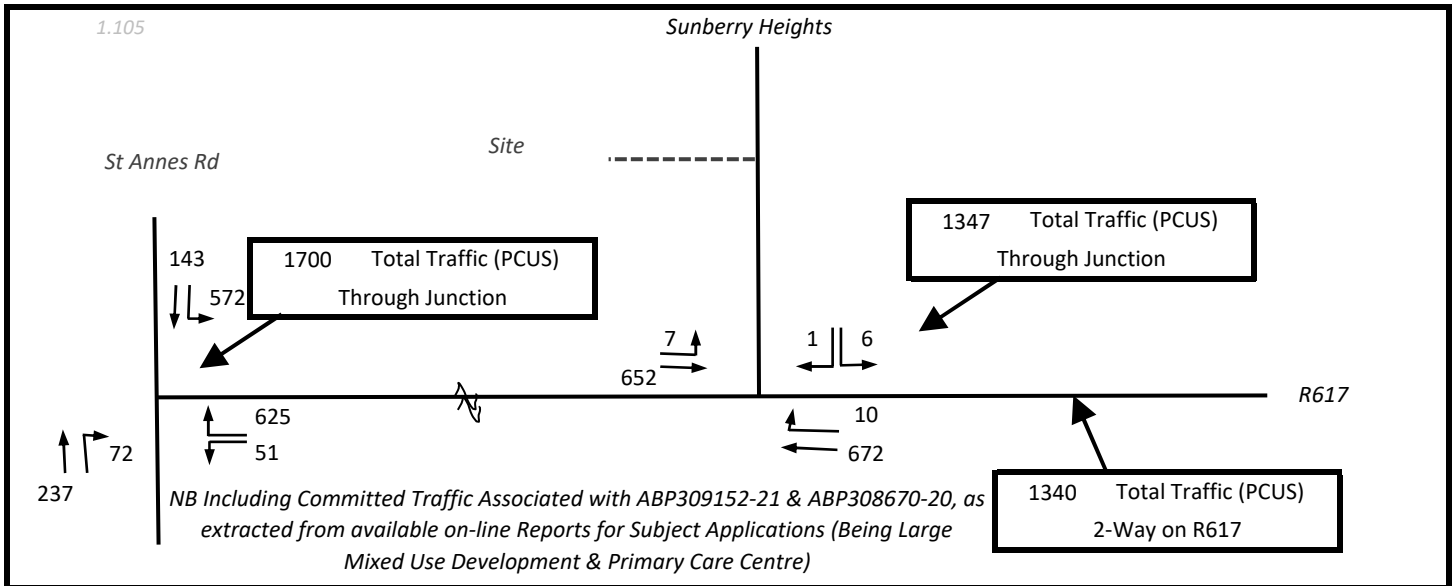
Existing Traffic Flow, Local Network
As Surveyed PM Peak Hour 5-6pm
Without Development (PCUs)

TII PE-PAG-02017 Project Appraisal Guidelines for National Roads Unit 5.3
(Travel Demand Projections 2019, Table 6.: Central Growth Rates: Annual Growth Factors - Metropolitan Cork)

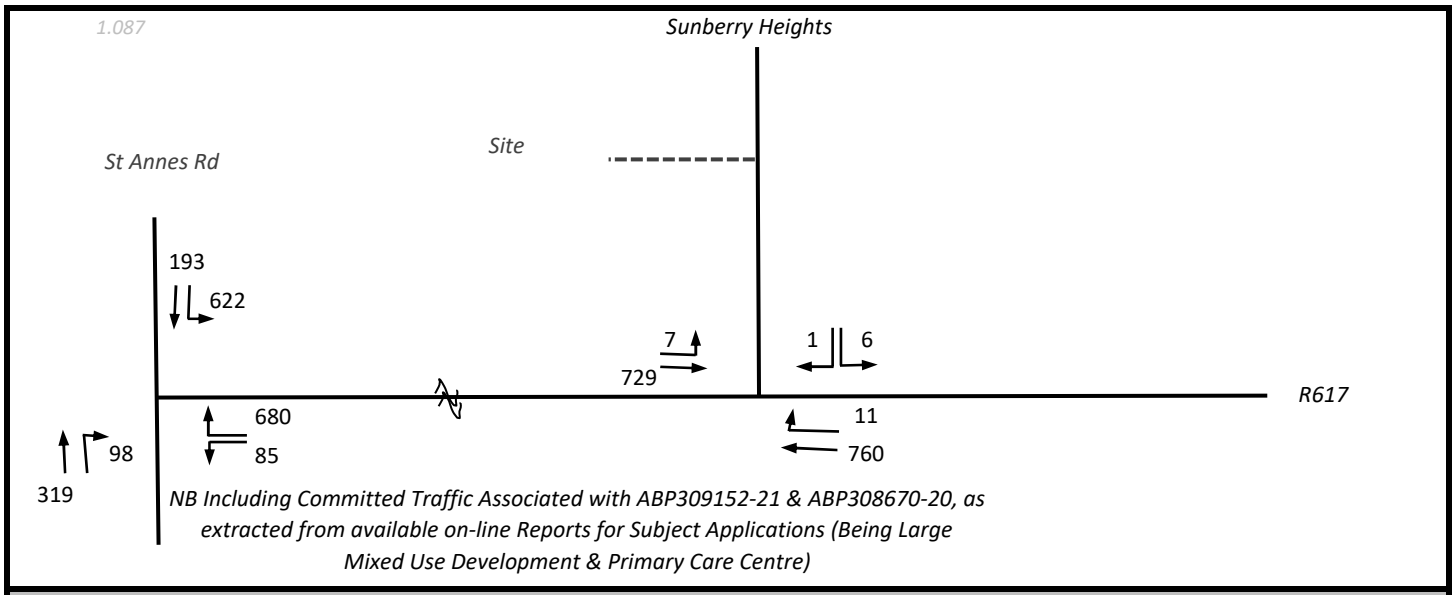
As Surveyed to Selected Opening 2024 = 1.105

Selected Opening Yr 2024 to Plus 5 Design Year 2029 = 1.087

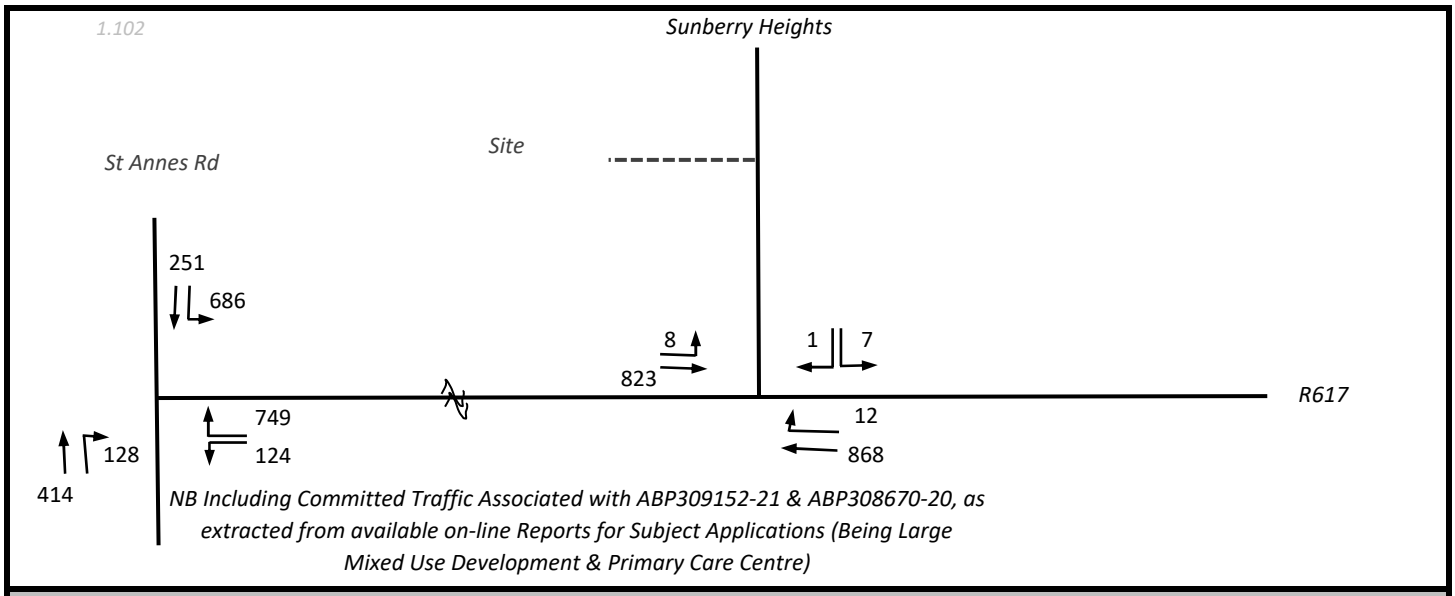
Plus 5 Design Year 2029 to Plus 15 Design Year 2039 = 1.102



Projected Traffic Flow, Local Network
PM Peak Hour 5-6pm, 2024 Selected Opening Year
With Committed Development BUT Without Subject Development (PCUs)



Projected Traffic Flow, Local Network
PM Peak Hour 5-6pm, 2029 ('Opening Plus 5' Design Year)
With Committed Development BUT Without Subject Development (PCUs)



Projected Traffic Flow, Local Network
PM Peak Hour 5-6pm, 2039 ('Opening Plus 15' Design Year)
With Committed Development BUT Without Subject Development (PCUs)

REFER TO APPENDIX C FOR ASSOCIATED TRICS DATA OUTPUT

TRICS Assessment (Traffic Generation Calculations, 105 Residential Houses)

105 Houses	Arrivals		Departures		Total 2-Way Traffic Generated
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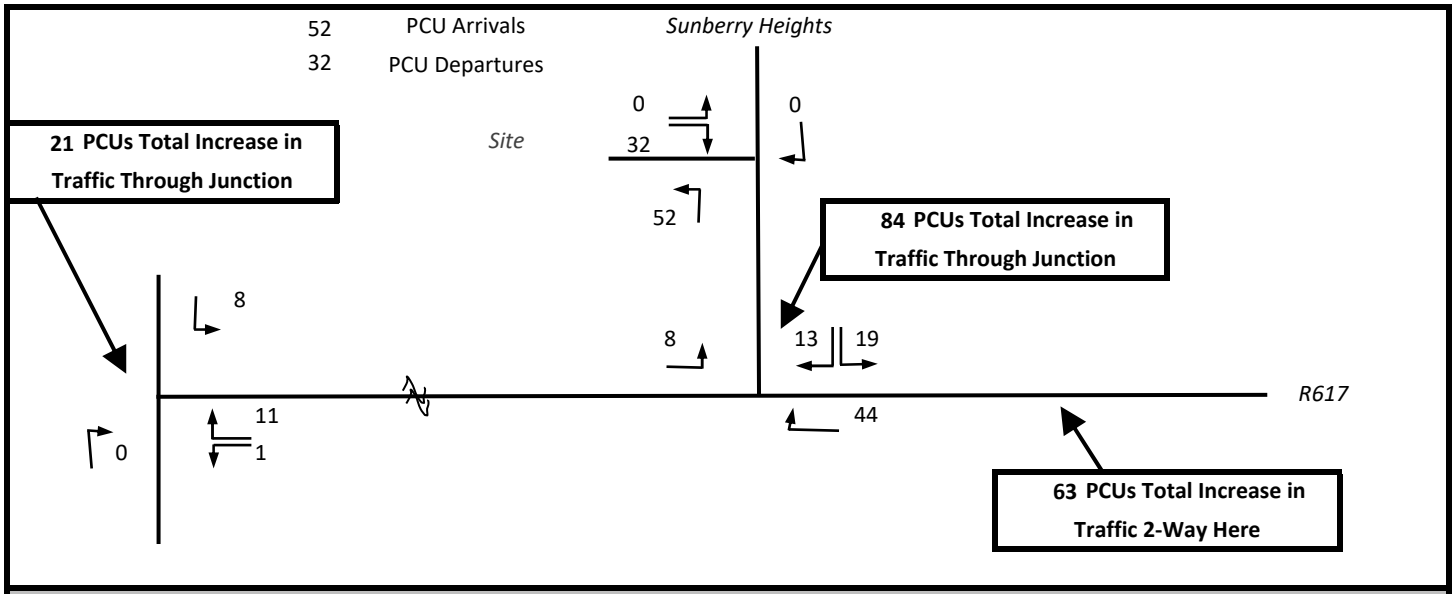
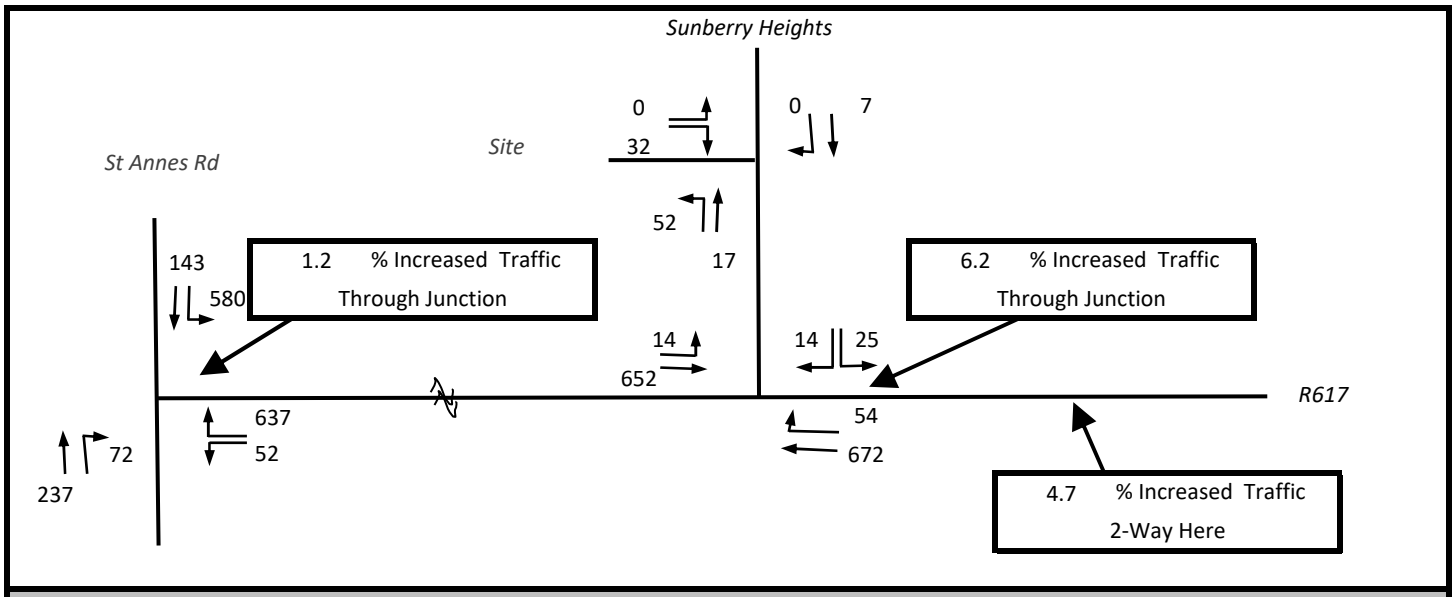
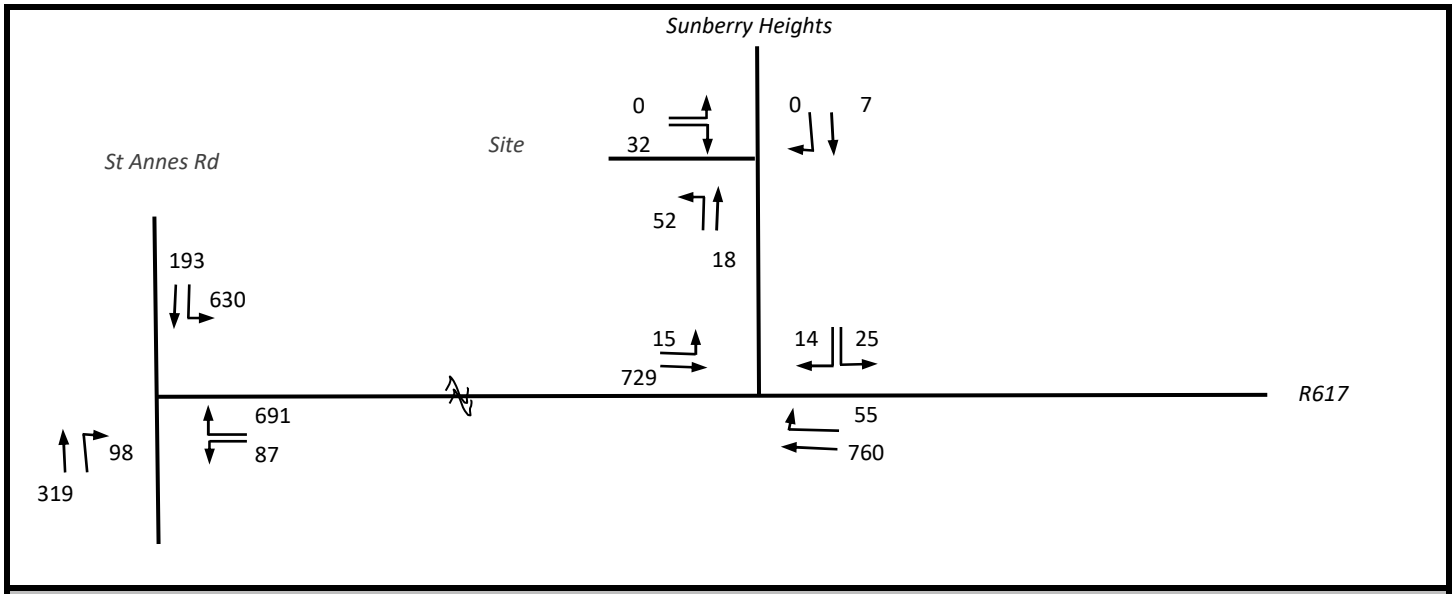
Network Period	Arrivals	Departures	Total 2-Way Traffic Generated
Weekday AM Peak	27	56	83
Weekday PM Peak	52	32	84



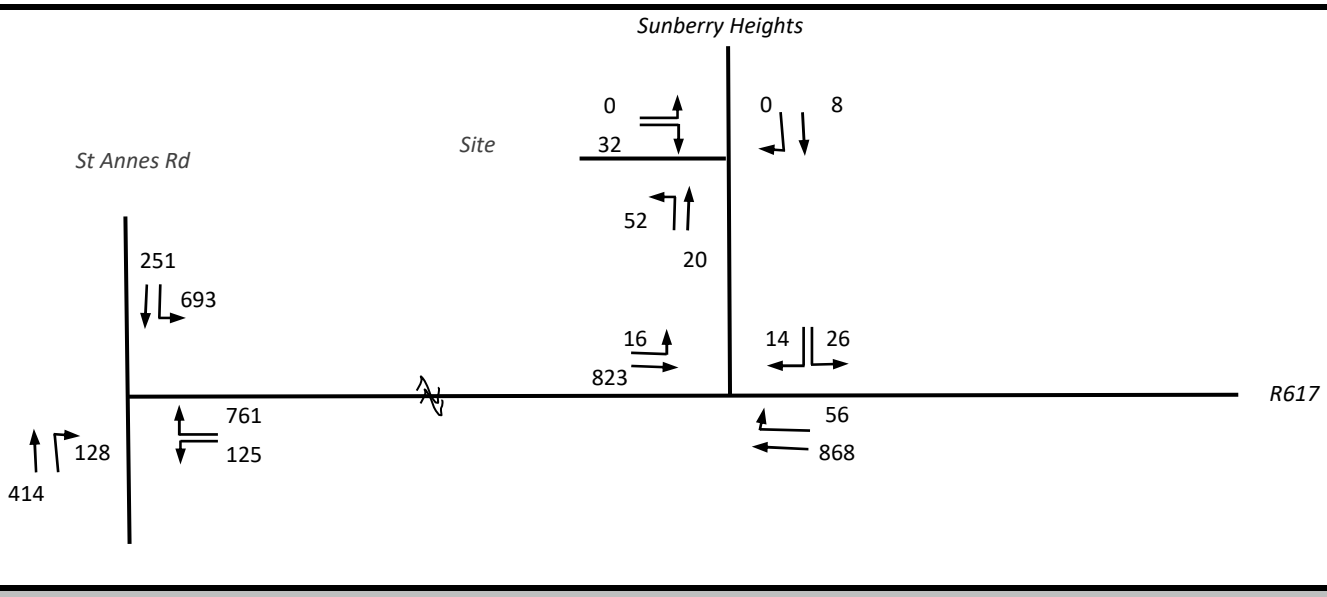
Assignment of Proposed Development Traffic to Local Roads - PM Peak Hour (5pm to 6pm)



Projected Traffic Flow, Local Network
PM Peak Hour 5-6pm, 2024 Selected Opening Year
WITH Committed AND Subject Development (PCUs)



Projected Traffic Flow, Local Network
PM Peak Hour 5-6pm, 2029 'Opening Plus 5 Design Year'
WITH Committed AND Subject Development (PCUs)



Projected Traffic Flow, Local Network
PM Peak Hour 5-6pm, 2039 'Opening Plus 15 Design Year'
WITH Committed AND Subject Development (PCUs)

APPENDIX D

PiCADY Junction Simulation Model Output
(Improved Junction at Sunberry Heights)

Sunberry Heights Junction
Summary PICADY Results in Order as included herein
(Robust & Worst Case – with Entire Development Occupied)

Modelled Scenario	Period Mean Max Q (PCUs)	Period Max RFC
2024 Opening Year AM Peak 8-9am	0.3	0.22
2024 Opening Year PM Peak 5-6pm	0.1	0.13
2029 Design Year +5 AM Peak 8-9am	0.3	0.25
2029 Design Year +5 PM Peak 5-6pm	0.2	0.14
2039 Design Year +15 AM Peak 8-9am	0.4	0.28
2039 Design Year +15 PM Peak 5-6pm	0.2	0.16

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

NB *Any Small Changes to Selected Opening Year 2024 or Associated Design Years 2029 & 2039 will 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\2017\17-052 Blarney Housing\Calculations\Picadys 2020 & 2021
Report generation date: 08/04/2021 14:39:07

Summary of junction performance

	AM				PM			
	Q (PCU)	Delay (s)	RFC	LOS	Q (PCU)	Delay (s)	RFC	LOS
	2024							
Stream B-AC	0.3	12.74	0.22	B	0.1	10.97	0.12	B
Stream C-AB	0.1	7.89	0.07	A	0.2	7.51	0.13	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	27/04/2020
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	Sunberry Heights Junction	T-Junction	Two-way	0.87	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	R617 Out of Town		Major
B	Sunberry Hts		Minor
C	R617 Town Side		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	7.00			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	0.096	0.243	0.153	0.347
1	B-C	681	0.100	0.252	-	-
1	C-B	626	0.232	0.232	-	-

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		✓	696	100.000
B		✓	72	100.000
C		✓	585	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	4	692
	B	29	0	43
	C	555	30	0

Vehicle Mix

HV %s

		To		
		A	B	C
From	A	0	0	2
	B	0	0	0
	C	2	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Q (PCU)	Max LOS
B-AC	0.22	12.74	0.3	B
C-AB	0.07	7.89	0.1	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	54	449	0.121	54	0.1	9.097	A
C-AB	23	523	0.045	23	0.0	7.204	A
C-A	417			417			
A-B	3			3			
A-C	521			521			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	65	413	0.157	65	0.2	10.322	B
C-AB	29	509	0.056	28	0.1	7.501	A
C-A	497			497			
A-B	4			4			
A-C	622			622			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	79	362	0.219	79	0.3	12.711	B
C-AB	36	493	0.074	36	0.1	7.890	A
C-A	608			608			
A-B	4			4			
A-C	762			762			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	79	362	0.219	79	0.3	12.744	B
C-AB	36	493	0.074	36	0.1	7.894	A
C-A	608			608			
A-B	4			4			
A-C	762			762			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	65	413	0.157	65	0.2	10.355	B
C-AB	29	509	0.056	29	0.1	7.505	A
C-A	497			497			
A-B	4			4			
A-C	622			622			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	54	449	0.121	54	0.1	9.132	A
C-AB	23	523	0.045	23	0.0	7.211	A
C-A	417			417			
A-B	3			3			
A-C	521			521			

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	Sunberry Heights Junction	T-Junction	Two-way	0.64	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		✓	646	100.000
B		✓	39	100.000
C		✓	696	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	14	632
	B	14	0	25
	C	642	54	0

Vehicle Mix

HV %s

		To		
		A	B	C
From	A	0	0	2
	B	0	0	0
	C	2	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Q (PCU)	Max LOS
B-AC	0.12	10.97	0.1	B
C-AB	0.13	7.51	0.2	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	29	459	0.064	29	0.1	8.370	A
C-AB	44	552	0.079	43	0.1	7.089	A
C-A	480			480			
A-B	11			11			
A-C	476			476			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	35	423	0.083	35	0.1	9.271	A
C-AB	54	548	0.099	54	0.1	7.298	A
C-A	572			572			
A-B	13			13			
A-C	568			568			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	43	371	0.116	43	0.1	10.957	B
C-AB	71	552	0.129	71	0.2	7.504	A
C-A	695			695			
A-B	15			15			
A-C	696			696			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	43	371	0.116	43	0.1	10.969	B
C-AB	71	552	0.129	71	0.2	7.510	A
C-A	695			695			
A-B	15			15			
A-C	696			696			

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	35	423	0.083	35	0.1	9.284	A
C-AB	54	549	0.099	54	0.1	7.309	A
C-A	572			572			
A-B	13			13			
A-C	568			568			

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	29	459	0.064	29	0.1	8.385	A
C-AB	44	552	0.079	44	0.1	7.104	A
C-A	480			480			
A-B	11			11			
A-C	476			476			

Junctions 9

PICADY 9 - Priority Intersection Module

Filename: 2029 AM PM.j9
Path: C:\Users\Eoin\NRB Consulting Engineers Ltd\NRB Server - Documents\2017\17-052 Blarney Housing\Calculations\Picadys 2020 & 2021
Report generation date: 14/02/2022 08:52:42

Summary of junction performance

	AM				PM			
	Q (PCU)	Delay (s)	RFC	LOS	Q (PCU)	Delay (s)	RFC	LOS
	2029							
Stream B-AC	0.3	14.59	0.25	B	0.2	12.81	0.13	B
Stream C-AB	0.1	8.08	0.08	A	0.2	7.61	0.14	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	27/04/2020
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	2029	AM	ONE HOUR	07:45	09:15	15
D2	2029	PM	ONE HOUR	16:45	18:15	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

2029, 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	Sunberry Heights Junction	T-Junction	Two-way	0.88	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	R617 Out of Town		Major
B	Sunberry Hts		Minor
C	R617 Town Side		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	7.00			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	0.096	0.243	0.153	0.347
1	B-C	681	0.100	0.252	-	-
1	C-B	626	0.232	0.232	-	-

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	2029	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		✓	768	100.000
B		✓	73	100.000
C		✓	666	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	4	764
	B	30	0	43
	C	636	30	0

Vehicle Mix

HV %s

		To		
		A	B	C
From	A	0	0	2
	B	0	0	0
	C	2	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Q (PCU)	Max LOS
B-AC	0.25	14.59	0.3	B
C-AB	0.08	8.08	0.1	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	55	427	0.129	54	0.1	9.649	A
C-AB	24	514	0.046	23	0.0	7.345	A
C-A	478			478			
A-B	3			3			
A-C	575			575			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	66	386	0.170	65	0.2	11.212	B
C-AB	29	499	0.058	29	0.1	7.666	A
C-A	570			570			
A-B	4			4			
A-C	687			687			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	80	327	0.246	80	0.3	14.533	B
C-AB	37	484	0.077	37	0.1	8.077	A
C-A	696			696			
A-B	4			4			
A-C	841			841			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	80	327	0.246	80	0.3	14.586	B
C-AB	37	484	0.077	37	0.1	8.082	A
C-A	696			696			
A-B	4			4			
A-C	841			841			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	66	386	0.170	66	0.2	11.261	B
C-AB	29	499	0.058	29	0.1	7.673	A
C-A	570			570			
A-B	4			4			
A-C	687			687			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	55	427	0.129	55	0.1	9.693	A
C-AB	24	514	0.046	24	0.1	7.349	A
C-A	478			478			
A-B	3			3			
A-C	575			575			

2029, 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	Sunberry Heights Junction	T-Junction	Two-way	0.62	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	2029	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		✓	744	100.000
B		✓	39	100.000
C		✓	815	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	15	729
	B	14	0	25
	C	760	55	0

Vehicle Mix

HV %s

		To		
		A	B	C
From	A	0	0	2
	B	0	0	0
	C	2	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Q (PCU)	Max LOS
B-AC	0.13	12.81	0.2	B
C-AB	0.14	7.61	0.2	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	29	431	0.068	29	0.1	8.957	A
C-AB	45	544	0.083	45	0.1	7.224	A
C-A	568			568			
A-B	11			11			
A-C	549			549			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	35	388	0.090	35	0.1	10.197	B
C-AB	57	542	0.105	57	0.1	7.430	A
C-A	676			676			
A-B	13			13			
A-C	655			655			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	43	324	0.133	43	0.2	12.788	B
C-AB	77	552	0.139	76	0.2	7.597	A
C-A	821			821			
A-B	17			17			
A-C	803			803			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	43	324	0.133	43	0.2	12.808	B
C-AB	77	552	0.139	77	0.2	7.605	A
C-A	821			821			
A-B	17			17			
A-C	803			803			

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	35	388	0.090	35	0.1	10.217	B
C-AB	57	543	0.105	57	0.1	7.443	A
C-A	676			676			
A-B	13			13			
A-C	655			655			

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	29	431	0.068	29	0.1	8.976	A
C-AB	45	544	0.083	46	0.1	7.238	A
C-A	568			568			
A-B	11			11			
A-C	549			549			

Junctions 9

PICADY 9 - Priority Intersection Module

Filename: 2039 AM PM.j9
Path: C:\Users\Eoin\NRB Consulting Engineers Ltd\NRB Server - Documents\2017\17-052 Blarney Housing\Calculations\Picadys 2020 & 2021
Report generation date: 14/02/2022 08:55:01

Summary of junction performance

	AM				PM			
	Q (PCU)	Delay (s)	RFC	LOS	Q (PCU)	Delay (s)	RFC	LOS
	2039							
Stream B-AC	0.4	17.57	0.28	C	0.2	15.40	0.16	C
Stream C-AB	0.1	8.31	0.08	A	0.2	7.68	0.15	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	27/04/2020
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	Sunberry Heights Junction	T-Junction	Two-way	0.94	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	R617 Out of Town		Major
B	Sunberry Hts		Minor
C	R617 Town Side		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	7.00			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	0.096	0.243	0.153	0.347
1	B-C	681	0.100	0.252	-	-
1	C-B	626	0.232	0.232	-	-

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		✓	857	100.000
B		✓	74	100.000
C		✓	761	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	4	853
	B	30	0	44
	C	730	31	0

Vehicle Mix

HV %s

		To		
		A	B	C
From	A	0	0	2
	B	0	0	0
	C	2	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Q (PCU)	Max LOS
B-AC	0.28	17.57	0.4	C
C-AB	0.08	8.31	0.1	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	56	403	0.138	55	0.2	10.335	B
C-AB	25	503	0.049	24	0.1	7.522	A
C-A	548			548			
A-B	3			3			
A-C	642			642			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	67	356	0.187	66	0.2	12.417	B
C-AB	30	488	0.062	30	0.1	7.874	A
C-A	654			654			
A-B	4			4			
A-C	767			767			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	81	286	0.285	81	0.4	17.460	C
C-AB	40	474	0.084	40	0.1	8.301	A
C-A	798			798			
A-B	4			4			
A-C	939			939			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	81	286	0.285	81	0.4	17.570	C
C-AB	40	475	0.084	40	0.1	8.307	A
C-A	798			798			
A-B	4			4			
A-C	939			939			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	67	356	0.187	67	0.2	12.498	B
C-AB	30	489	0.062	31	0.1	7.881	A
C-A	654			654			
A-B	4			4			
A-C	767			767			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	56	403	0.138	56	0.2	10.392	B
C-AB	25	503	0.049	25	0.1	7.530	A
C-A	548			548			
A-B	3			3			
A-C	642			642			

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	Sunberry Heights Junction	T-Junction	Two-way	0.64	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		✓	839	100.000
B		✓	40	100.000
C		✓	924	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	16	823
	B	14	0	26
	C	868	56	0

Vehicle Mix

HV %s

		To		
		A	B	C
From	A	0	0	2
	B	0	0	0
	C	2	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Q (PCU)	Max LOS
B-AC	0.16	15.40	0.2	C
C-AB	0.15	7.68	0.2	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	30	405	0.074	30	0.1	9.580	A
C-AB	47	537	0.088	47	0.1	7.360	A
C-A	648			648			
A-B	12			12			
A-C	620			620			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	36	355	0.101	36	0.1	11.270	B
C-AB	60	538	0.112	60	0.1	7.552	A
C-A	771			771			
A-B	14			14			
A-C	740			740			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	44	278	0.159	44	0.2	15.360	C
C-AB	83	554	0.150	83	0.2	7.665	A
C-A	934			934			
A-B	18			18			
A-C	906			906			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	44	278	0.159	44	0.2	15.401	C
C-AB	83	555	0.150	83	0.2	7.678	A
C-A	934			934			
A-B	18			18			
A-C	906			906			

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	36	355	0.101	36	0.1	11.303	B
C-AB	60	539	0.111	60	0.2	7.566	A
C-A	771			771			
A-B	14			14			
A-C	740			740			

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	30	405	0.074	30	0.1	9.605	A
C-AB	47	537	0.088	47	0.1	7.371	A
C-A	648			648			
A-B	12			12			
A-C	620			620			

APPENDIX E

Preliminary Mobility Management Plan (Travel Plan)

consulting engineers

NRB

Preliminary
Travel Plan
(Mobility Management Plan)

Appendix E

For

Residential Development

at

Sunberry Heights,

Blarney, Co. Cork.

SUBMISSION ISSUE

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Registered in Ireland No. 491679

Contents

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Registered in Ireland No. 491679

1.0 INTRODUCTION

1.1 NRB Consulting Engineers have been commissioned to prepare a Preliminary Travel Plan (or Mobility Management Plan) for an application for a Residential Development at Sunberry Heights, Blarney - in order to explain the applicants commitment to the promotion of more sustainable and cost effective travel habits among the end occupiers/residents of the scheme, which is an extension to an established residential development in the heart of the town centre.

What is a Travel Plan?

1.2 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.

1.3 A MMP or Travel Plan (TP) consists of a package of measures put in place by an organisation to encourage and support more sustainable travel patterns among residents, staff and other visitors. Such a plan usually concentrates on 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

1.4 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 MMP recognises the fact that, for some people, car use is often essential as part of the home-work commute, as the work commute is often combined with other important trips, for example having to drop children to school or crèche on the way.

1.5 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.

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

- Reduced residential 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 & 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 making better travel decisions in the future,
- Improved health and well-being for those using active non-car transport modes,
- On-going 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

1.7 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)

1.8 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 for the site. Following on, once occupied, Residents 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.

1.9 This information will then be used as the basis for an assessment, drawing conclusions and recommendations

2.0 ACCESS TO THE SITE - BY MODE

2.1 The entire of the subject proposed Strategic Housing Development consists of the construction of a total of 143 Residential Housing Units (comprising 105 Houses and 38 Apartments). A location plan in relation to the area is shown below as ***Figure 2.1***.

Figure 2.1 – Site Location Map

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

2.3 Notwithstanding this, the development is located in the heart of Blarney and is in very close proximity to the range of public & alternative transport services in the town, including local and regional Bus Services, and the Cork City Cycle Network serving Blarney.

Cyclists

2.4 Cork City Council & County Councils commissioned and produced a Cycling Network Plan for the Cork City Metropolitan Area and surrounding towns. The objective was to provide a clear plan for the future development of the cycling network in the Metropolitan Area, including Blarney, in order to encourage greater use of cycling for trips to work, school, recreation and leisure. The entire plan is published on the Cork County Council website at the following link;

https://www.corkcoco.ie/sites/default/files/2018-02/Final%20Published%20CMA%20Cycle%20Network%20Plan%20Jan%202017.pdf;

2.5 The Cork Cycle Study area is defined on Page 8 of the *Aecom* Plan, and is reproduced below as ***Figure 2.2***

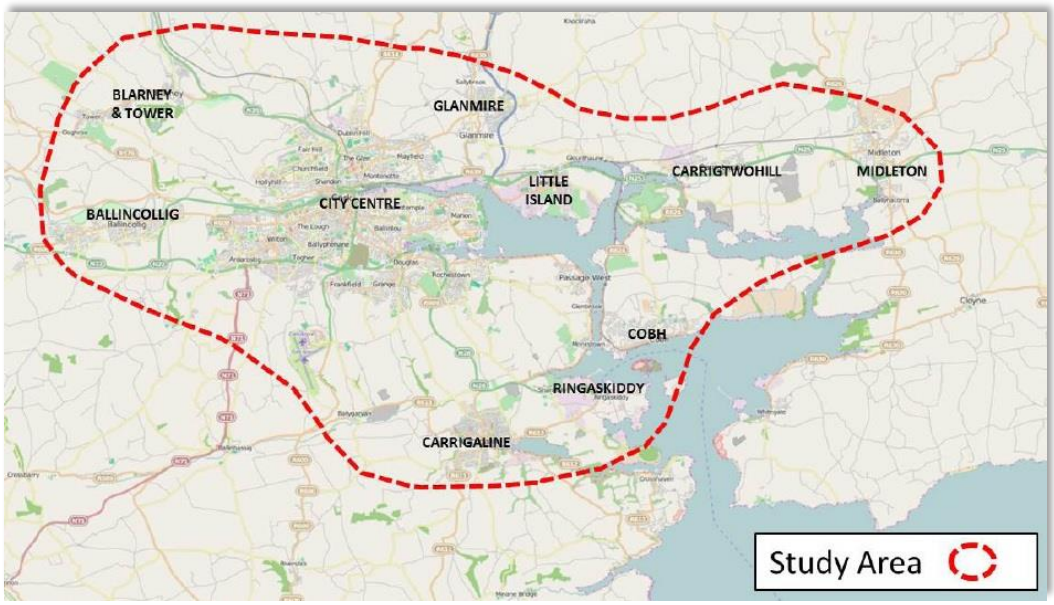

Figure 2.2 – Cork Cycle Network Plan Area

2.6 The Report states that many of the Study Area towns have varying quality of cycle infrastructure currently in place, but it sets down a detailed plan showing future improved infrastructure in place for each town within the Study Area. In the case of Blarney, it illustrates the planned network on Page 132, and we have reproduced this plan and the site in context below as ***Figure 2.3***

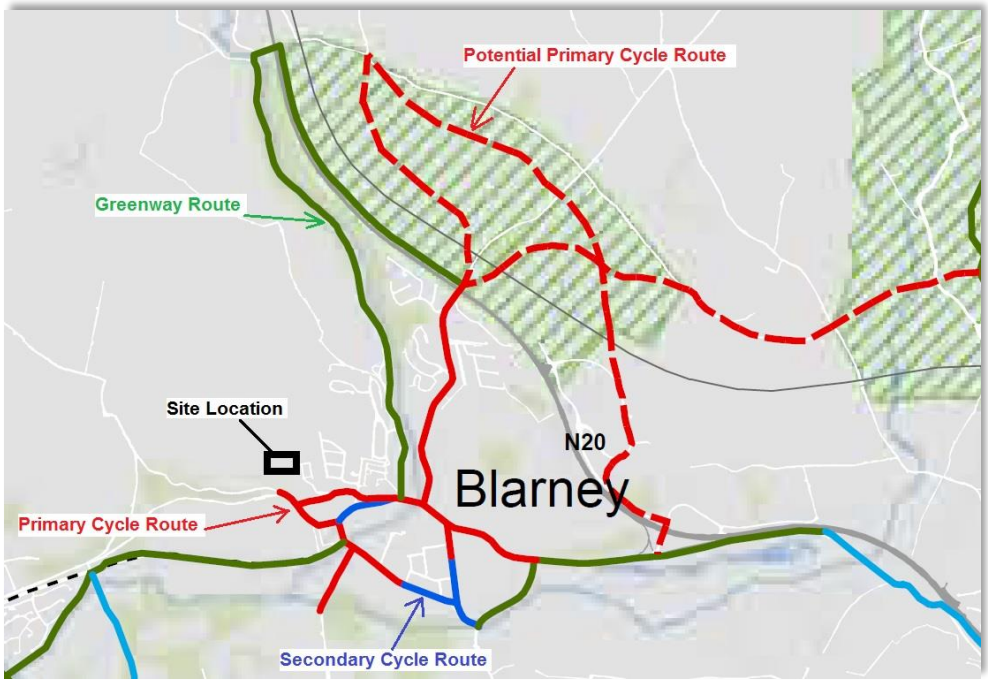

Figure 2.3 - Site Location in Context of Cycle Network Infrastructure for Blarney

(Reference Aecom Cycle Network Plan P132)

2.7 The development is clearly ideally placed in terms of being served by a "Primary Cycle Route" (Solid Red Line above) and is also adjacent a "Greenway Route" (Green Line above). In this regard, the proposed development compliments the Cork Metropolitan Area Cycle Network Plan, and is ideally placed to benefit from the infrastructure

Pedestrians

2.8 The site is located within the centre of Blarney, and is ideally placed to promote walking as a sustainable mode of travel, reducing the need to travel by car for primary journeys. The site is linked to a high quality network of urban public footpaths on either side of the surrounding streets.

2.9 During previous discussions with Local Authority officials, it was suggested that we should illustrate the walking distances to schools in the area, as these trips are most easily influenced. We have plotted the walk distance to the local Schools in Blarney on ***Figure 2.4*** below. It should be noted that there are continuous footpath links between the site and these schools.

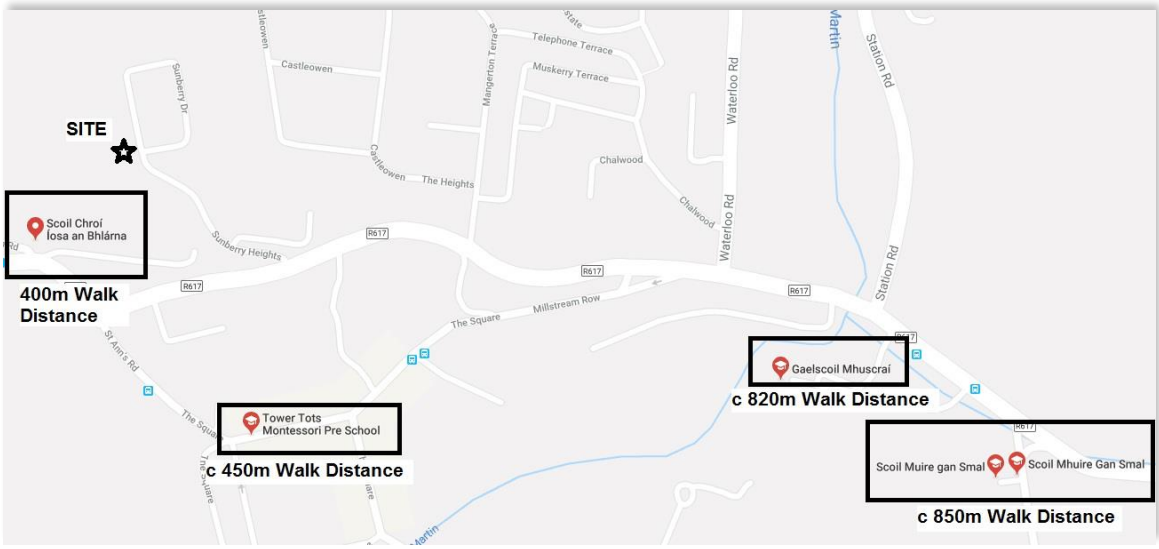

Figure 2.4 – Walk Distance Between Site & Local Schools

2.10 It is clear from the above that all of the schools in Blarney are within an easy and accessible walk distance of the site, with less than a 15min walk time to the **furthest** school

2.11 Based on our review, the site is ideally located to benefit from the current and planned pedestrian and cyclist infrastructure within Blarney Town Centre

Site Connectivity to Local Network, Schools, Services & Town Centre

2.12 We have illustrated proposed improvements to Sunberry Heights to provide for enhanced connectivity of the site to the local network. These improvements include provision for pedestrians and cyclists, and are as set out on the included within the Transportation Assessment Report and part-reproduced below as ***Figure 2.5***

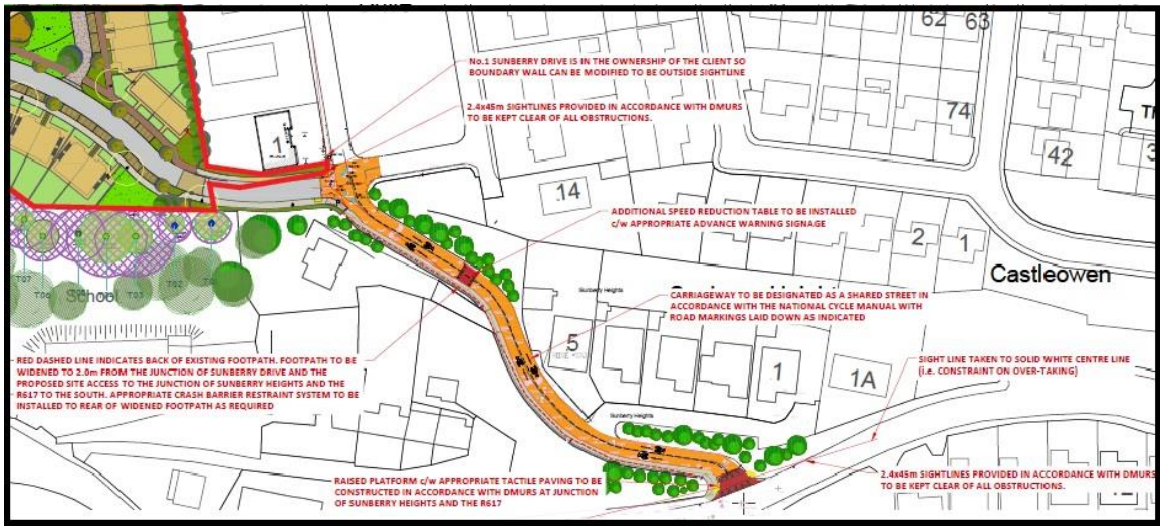

Figure 2.5 - Extract from Site Access & Layout Drawings

2.13 The location of the proposed development is ideal in terms of encouraging walking, being located in the heart of the town centre. The proximity to schools, shops and services within the town means that walking will be an attractive alternative option for the vast majority of residents. The CCC and national objective is to cultivate and promote walking & cycling, 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.

2.14 Cycling and walking are the modes of sustainable transport that deliver environmental, health and economic benefits to both the individual and the community.

2.15 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.

2.16 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:

- Supporting Cycling through increased residential development within the town centre,
- 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.

Bus Services

2.17 Bus Stops for local and regional bus services are provided within the heart of Blarney, with public bus stops a short walking distance from the site, as illustrated below as ***Figure 2.6***

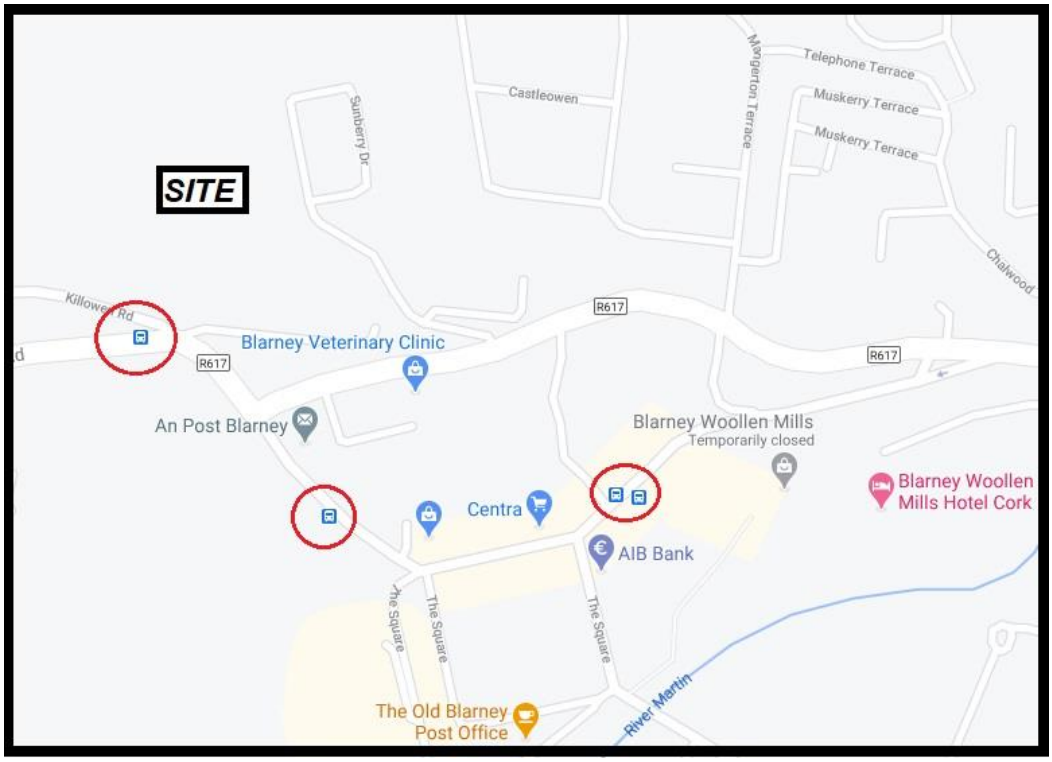

Figure 2.6 – Town Centre Bus Stop Locations

2.18 Bus Eireann operate a commuter service #215 (Cloghroe – Blarney – Cork City Centre – Ballinlough – MahonPoint), and these 30min peak frequency services are in very close proximity to the site. The frequency and quality of service is clearly demonstrated by way of an AM timetable extract included below as ***Figure 2.7***.

Blarney (Filling Station)	07:47	08:18	08:48	09:18	09:48	10:18	10:50	11:20	11:50	12:20	12:56	13:26	13:56	14:26	14:56	15:26	15:56
Blarney Village (Woolen Mills)	07:48	08:19	08:49	09:19	09:49	10:19	10:51	11:21	11:51	12:21	12:57	13:27	13:57	14:27	14:57	15:27	15:57
Blarney (St Anne's Road)	07:49	08:20	08:50	09:20	09:50	10:20	10:52	11:22	11:52	12:22	12:58	13:28	13:58	14:28	14:58	15:28	15:58
St. Annes Road (Pauls Cross)	07:50	08:21	08:51	09:21	09:51	10:21	10:53	11:23	11:53	12:23	12:59	13:29	13:59	14:29	14:59	15:29	15:59

Figure 2.7 – Service #215 – AM Timetable Extract

Cycle Parking

2.19 Clearly residents in houses will have cycle parking within their demise, and cycle parking for apartment residents is provided within the basements of the development consistent with the Local and National Guidelines.

2.20 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 in line with new national Design Standards. 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 CCC, as the ongoing provision of cycle facilities as set out above is fully implemented.

2.21 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 will be 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.

2.22 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).

Car Parking

2.23 There are a reduced number of private car parking spaces provided within the site, at surface level within the demise of the houses or within the apartment basement (which can include *Go-Car*, Residential Spaces, mobility impaired and visitor parking). This is considered appropriate in light of the location of the proposed development immediately adjacent reasonably high quality public transport. The development will also be managed on an on-going basis to ensure that the reduced car dependency nature of the development is continually promoted and enhanced.

2.24 A lower provision of car parking in itself acts as a demand-management measure, ensuring that a development is occupied in the most sustainable manner, being designed to be reliant on non-car modes of travel.

2.25 If considered appropriate, as part of a working MMP, additional priority spaces will in future be allocated to car-sharing workers when they travel together. These can be dedicated as some of the most accessible spaces and will be clearly visible as-such to other car park users.

Electric Vehicle Charging

2.26 The car parking spaces within the site can all easily be designed so that they can be upgraded to allow conversion for Electric Vehicle Charging. The entire car park areas of the subject scheme can and will be 'ducted' to accept cabling to serve a charging point for every car space. Conduits can be run on the walls, or buried within landscaped areas, where charging points can also be mounted.

2.27 In cases where residents request a charging point to be installed, the relevant charging point can be pre-wired back to their home electricity meter in the designated meter location. The socket point can have a lockable cover on it so that only that resident may use the power point. This provision around the parking area would allow future charging points to be installed at any of the car parking spaces with minimum works, as and when required.

Communication

2.28 Prior to moving in, the Travel Plan Coordinator will issue welcome packs to all new 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 time-slot to move in. The preparation of this information ensures residents are familiar with the operation of the development before moving in.

2.29 In terms of number of transport alternatives easily available to Residents, 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 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.

2.30 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.

2.31 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.

2.32 Working Residents 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.

2.33 With this in mind, the main focus of this 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 The Redevelopment is a proposed high quality Residential Development, as an extension to an established residential estate within the heart of Blarney.

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

3.3 Shortly after occupation of the new development, a detailed travel-questionnaire will be complied and distributed to New Residents for completion. The aim of the travel questionnaire will be to establish travel patterns between work and home and school travel demand. 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 sustainable location within a town centre and good transport links at this development, combined with the controlled car parking on site, there will be a high percentage of use accessing via public & alternative transport. 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%.

3.6 The Travel Plan is not seeking a radical change in terms of a modal shift; it is recognised that the use of the car is often essential for many users. Instead, the Plan seeks small but consistent increments of change in our approach to, and the use of, alternatives to the car.

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.

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

4.4 There are many local, global, and personal benefits to walking to work, 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.

4.5 Most adults will consider walking a maximum of 3.5 km (Approx 30/40 minutes) to work. Residents 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.

4.6 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 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

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

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

4.9 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.

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

4.11 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;
- It will publicise cycle parking availability by way of signage and on notice boards;
- It will display maps on notice boards areas so people can plan journeys;
- The development can provide free cycle accessories (panniers, lights, visi-vests, 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 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

4.12 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.

4.13 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, Timetables and Frequencies, 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.

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 - Car Sharing

4.14 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.

4.15 Although use of the car to get to work or to school is essential for a large proportion of people, car sharing schemes have the potential to deliver a significant reduction in private vehicle trips by promoting higher than average occupancy rates for each vehicle.

4.16 A locally run car sharing scheme relies on a database containing workplace information, working hours, and peoples preferences such as gender/driver/passenger and their preferred route to and from work. The car-sharing database can be a map showing where Residents work, a database of car-sharers' details hosted on an organisations intranet site, or an on map-based matching website.

4.17 Car sharing often happens informally, however some participants often prefer a formal scheme such as for example a Go Car facility which will normally generate a higher take-up for car sharing, and more efficiency in terms of increased occupancy rates. Car sharing is much easier promoted within a community such as is proposed here.

4.18 Encouraging more Residents 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.

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

- Provide incentives to sign up to a car sharing scheme with preferential parking spaces in the most convenient location;
- Draw up a car-sharing policy for how the scheme will operate, and issue car-sharing permits to those qualifying to use the car-sharing spaces;

- 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 using www.carsharing.ie.
- Allocate parking spaces for use solely by car sharers, for example near to building entrances.

Action Plan Summary Table

4.25 The Summary Action Plan is described in the Table below. Modal Split Targets will be determined following on from the first Residential 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

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

5.5 To ensure the plan is effective it is essential for a Travel Plan Coordinator to be appointed for the Development upon near 100% occupation.

5.6 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.

5.7 To support the Travel Plan Coordinator's efforts, they must 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

5.9 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.

5.10 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.

5.11 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.

5.12 The Coordinator can identify communication tools and networks used by the different audiences in the Residences, and use these to communicate about travel.

5.13 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.

5.14 The plan should not be anti-car - it should be about promoting equity among modes and offering choice and accessibility.

5.15 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.

5.16 Marketing drives which feature individual Residents 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 commitment to the Plan.

6.0 CONCLUSIONS

6.1 The development forming the subject of this application accords with the principles of sustainable development, being located within clear and easy access to alternative non-car modes of travel within a town centre. With controlled car parking provided, this also acts as a significant demand-management measure in the promotion of alternatives to the car as a first choice mode of travel. The Travel Plan Coordinator, 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 through identifying the current & future connections that are available . 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 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 and Residents. This will serve to spread the work load, and also give the Residents a valuable input into the operation of the Plan.

6.5 Successful Travel Plans require extensive 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 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 at full occupation. The plan should evolve and develop with the development, taking into account changing Residents 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.

APPENDIX F

DMURS Statement of Consistency

consulting engineers

NRB

DMURS Design Compliance Statement Technical Note

Appendix F

For

Proposed Residential Development

At

Sunberry Heights, Blarney.

SUBMISSION ISSUE

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

Registered in Ireland No. 491679

1.0 INTRODUCTION

1.1 It is NRB's opinion that the proposed residential development is consistent with both the principles and guidance outlined within the *Design Manual for Urban Roads and Streets* (DMURS) 2013 as amended in 2019. The scheme proposals are the outcome of an integrated design approach by the entire Design Team, as an extension to ab established neighbourhood in Blarney Town Centre. This approach sought to implement a sustainable community connected by well-designed links, layout and accesses - which combined deliver attractive, convenient and safe access in addition to promoting modal shift and viable alternatives to car based journeys.

1.2 The following section discusses design features which are incorporated within the proposed mixed residential scheme with the objective of delivering a design that is consistent with the principles of DMURS.

2.0 DESIGN ATTRIBUTES

2.1 The proposed layout strategy seeks to maximise connectivity between key local destinations through the provision of a high level of **permeability and legibility** for all journeys, particularly for sustainable forms of travel (cycling and walking). The proposed residential scheme delivers greater mode & route choices along direct, attractive and safe linkages to local amenities and schools/service destinations.

2.2 High Quality Connections between the proposed development and the local roads and public transport services within the town are provided. The internal road layout itself been designed to deliver a hierarchy which provide safe access within / across the proposed new residential community, linking the site and community with the established and proposed local network. Safe well designed routes are provided for pedestrians and for cyclists from the Town Centre.

2.3 As part of the development the movement function is designed to respect the different levels of motorised traffic whilst optimising access to/from alternative transport and catering for higher number of pedestrians & cyclists. In parallel, the adopted design philosophy has sought to consider the context / place status of the scheme in terms of level of connectivity provided, quality of the proposed design, level of pedestrian / cyclists activity and vulnerable users requirements whilst identifying appropriate 'transition' solutions particularly at street junctions.

2.4 The layout of the proposed development seeks to maximise permeability and enhances legibility, and the design of appropriately sized blocks actively contributes to a highly permeable and accessible community for both pedestrians and cyclists.

2.5 The proposed layout seeks to successfully create an appropriate balance between the functional requirements of different network users whilst enhancing the 'sense of place'. Design attributes of the proposed layout which contribute to achieving this ***DMURS objective*** include:

a) The main vehicular access roads to the development are by way of the established simple priority controlled junction from the established Sunberry Heights roadway,

b) The proposed scheme includes provision of well designed connections and links to the town centre, enhancing permeability for non-car modes.

c) Under ***Section 3.4.1 Vehicle Permeability***, DMURS states that 'Permeable layouts provide more frequent junctions which have a traffic-calming effect as drivers slow and show greater levels of caution'. This is clearly provided for within the layout design with a permeable street network.

d) DMURS also goes on to state that 'Designers may be concerned that more permeable street layouts will result in a higher rate of collisions. However, research has shown that there is no significant difference in the collision risk attributable to more permeable street layouts in urban areas and that more frequent and less busy junctions need not lead to higher numbers

e) The proposed design deliberately seeks to specify minimal signage and line markings along the internal layout, with such treatments used sensitively throughout and predominately at key nodes and ‘transition’ areas.

f) Footpaths no less than 1.8m (generally 2.0m or wider) will be provided throughout the scheme with connections and tie-ins to existing external pedestrian networks.

g) Appropriate clear unobstructed visibility splays, as per DMURS requirements, are provided at the site access junctions to the external road network, and internally within the site, with Forward Stopping Distance maintained around bends.

h) Well designed and frequent pedestrian crossing facilities will be provided along key travel desire lines throughout the scheme in addition to those located at street nodes where raised platforms are provided consistent with DMURS.

i) All courtesy crossings will be provided with either dropped kerbs with appropriate tactile paving, and/or raised tables, thereby allowing pedestrians to informally assert a degree of priority. The street activity and landscaping design within the open space aid in this aspect of the layout.

j) At the R617 Public Road Junction, further sightline, street lining and alignment improvements are proposed to enhance safety and traffic progression.

k) Internally within the site, all informal pedestrian crossing facilities will be at least 2.0m wide, whilst any required controlled pedestrian crossings will be a minimum of 2.4m wide.

l) With the objective of encouraging low vehicle speeds and maximising pedestrian safety and convenience, corner radii will be 6m where swept path analysis permits and will be of further reduced radii where feasible in line with DMURS guidance.

m) Internally within the development, where carriageway kerb are required, heights will be typically 75-80mm in accordance with the objectives of DMURS.

n) Within the development, as required, cyclists will share the carriageway with other street users as per the National Cycle Manual guidance for such situations and best practice for residential streets of this nature.

o) Any required street signage and road markings will be in accordance with the Department of Transport Traffic Signs Manual, and the location and form will be agreed in advance with Cork City Council.

NRB consulting engineers

APPENDIX G

Independent Stage 1 Road Safety Audit & Designer Feedback Form

Title: **STAGE 1 ROAD SAFETY AUDIT**

For;

Proposed Strategic Housing Development, Blarney

Client: **NRB Consulting Engineers**

Date: **September 2021**

Report reference: **0763R02**

VERSION: **FINAL**

Prepared By:

Bruton Consulting Engineers Ltd

Glaspistol
Clogherhead
Drogheda
Co. Louth.

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CONTENTS SHEET

Contents

1.0 Introduction

This report was prepared in response to a request from Mr. Eoin Reynolds, NRB Consulting Engineers, for a Stage 1 Road Safety Audit of a proposed strategic housing development at Sunberry, Blarney, Co. Cork.

The Road Safety Audit Team comprised of;

Team Leader: **Norman Bruton**, BE CEng FIEI, Cert Comp RSA.

TII Auditor Approval no. NB 168446

Team Member: **Owen O'Reilly** B.SC. Eng Dip Struct. Eng NCEA Civil Dip Civil.Eng CEng MIEI

TII approval number: OO 1291756

The Road Safety Audit comprised an examination of the drawings and reports by the Audit Team. A site visit was undertaken on the 3rd of July 2020 by the Audit Team, together. The weather at the time of the site visit was dry and the road surface was also dry.

This Stage 1 Road Safety Audit has been carried out in generally accordance with the requirements of TII, Publication Number GE-STY-01024, dated December 2017 and in accordance with TII advice during the Covid-19 pandemic.

The scheme has been examined and this report compiled in respect of the consideration of those matters that have an adverse effect on road safety. It has not been examined or verified for compliance with any other standards or criteria.

The problems identified in this report are considered to require action in order to improve the safety of the scheme for road users.

If any of the recommendations within this safety audit report are not accepted, a written response is required, stating reasons for non-acceptance. Comments made within the report under the heading of Observation are intended to be for information only. Written responses to Observations are not required.

A location map showing where each problem occurs is provided in **Appendix A.**

A list of the documents provided to the Audit Team is provided in **Appendix B.**

The feedback form for the Design Team Leader to complete is provided in **Appendix C.**

2.0 Background

It is proposed to construct a strategic housing development including 105 houses, 38 apartments and a small ancillary creche off Sunberry Drive in Blarney, Co. Cork.

It is proposed to upgrade the existing Sunberry Drive/Sunberry Heights Road from its junction with the R617 Regional Road.

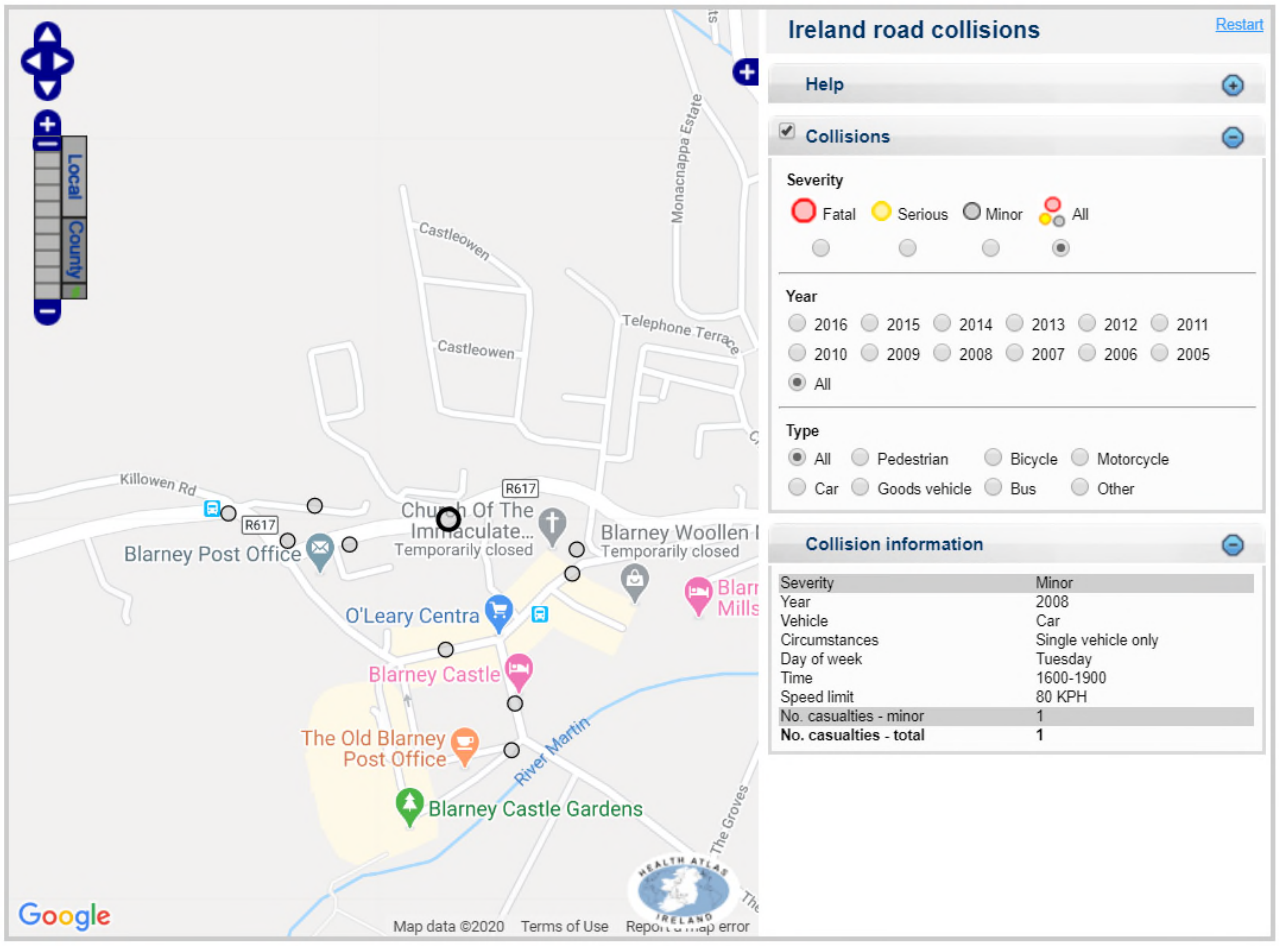
This road has a steep decline towards the R617. It is proposed to introduce traffic calming tables at the junction mouth and approximately 2/3 distance along the route.

The speed limit is 50km/hr. It is proposed that the speed limit within the development will be 30km/hr.

The site location map is shown below.

Image courtesy of openstreetmap.org

The Road Safety Authority's website www.rsa.ie gives details of the recorded injury collisions on the road network between 2005 and 2016. The mapping shows that there was only one minor injury collision at or close to the junction of the R617 and Sunberry Heights in 2008. That was single vehicle collision.



3.0 Items Raised in This Road Safety Audit.

3.1 Problem

Location

Drawing NRB-TA-002 Rev A.

Problem

The existing Sunberry Heights carriageway is very steep and may result in loss of traction for vehicles in wet or icy conditions. This could result in collisions with cyclists, other vehicles, loss of control or overshoot onto the R617.

Recommendation

It is recommended that a surfacing course with a high polished stone value (PSV) aggregate is provided on the carriageway, particularly on approach to the R617 junction. In addition, a salt storage container should be provided to facilitate salting/gritting in adverse weather conditions.

3.2 Problem

Location

Drawing NRB-TA-002 Rev A

Problem

There is an existing safety barrier on the western verge of the Sunberry Heights carriageway. The existing safety barrier does not appear to have suitable terminals to provide anchorage if the barrier is struck by an errant vehicle. It the barrier is struck the vehicle may not be contained which would result in higher severity injury outcomes for the vehicle occupants.

Recommendation

It is recommended that a safety barrier risk assessment is carried out. If barrier is required as a result of that risk assessment, then it should be installed in accordance with current standards including terminals and transitions.

3.3 Problem

Location

Drawing NRB-TA-002 Rev A

Problem

There is a proposed dropped kerb for an uncontrolled pedestrian crossing on the access to the development arm of the crossroads junction at Sunberry Driver however there is no corresponding provision from East to West. This could result in trips and falls as pedestrians have to mount high kerbs to access the new footpath.

Recommendation

It is recommended that an uncontrolled pedestrian crossing be provided from East to West across Sunberry Heights. Suitable inter-visibility between crossing pedestrians and drivers should be provided at the crossing point.

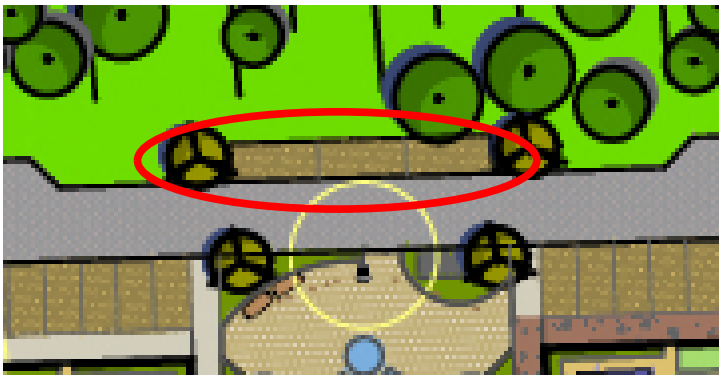
3.4 Problem

Location

Drawing NRB-TA-001 Rev A

Problem

There are three visitor parking spaces on the northern side of the site. These parking spaces do not have a footpath to the rear where vehicle users can use. This could lead to slips or falls on grassed areas during wet or frosty conditions.



Recommendation

It is recommended that a footpath be provided to the rear of the parking spaces with a dropped kerb suitable located to allow access to the footpath for the mobility impaired.

3.5 Problem

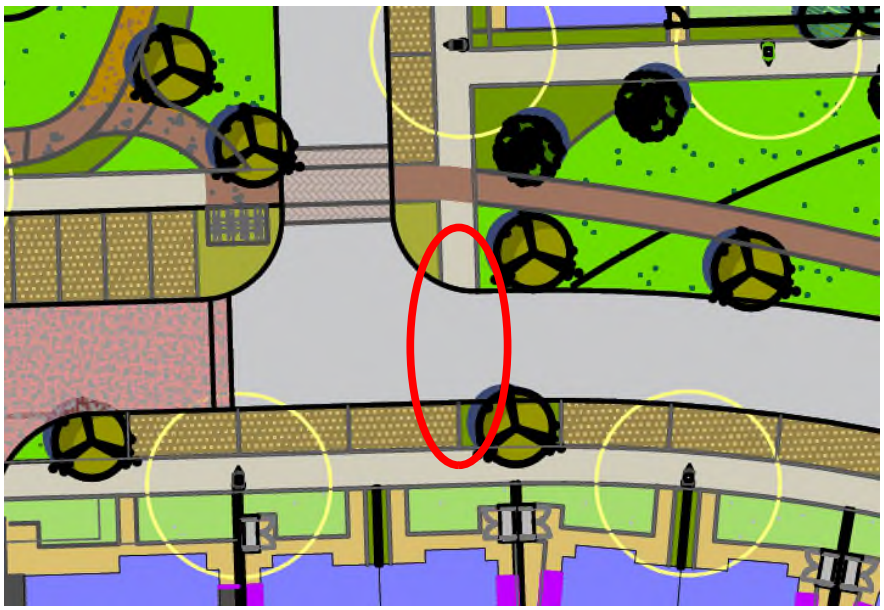
Location

Drawing NRB-TA-001 Rev A.

Problem

There will be a pedestrian desire line across the main access road within the development. There is no provision for an uncontrolled crossing. This could lead pedestrians to cross between parked vehicles or to

cross onto the grassed verge which could lead to slips and falls. This would also be a desire line to the creche which could lead to difficulties for those pushing buggies who may opt to stay on the carriageway.



Recommendation

It is recommended that an uncontrolled pedestrian crossing be provided along the desire line.

4.0 Observations

4.1 Observation

Drainage facilities for road surfaces will be required at the detailed design stage to ensure that surface water ponding does not occur particularly at the raised speed tables and at uncontrolled pedestrian crossing points with dropped kerbs.

4.2 Observation

The double yellow road markings will have to be reinstated on Sunberry Heights to prevent parking presumably associated with the nearby national school.

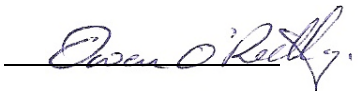
5.0 Audit Statement

We certify that we have examined the site and the information provided. The examination has been carried out with the sole purpose of identifying any aspects of the design which could be added, removed or modified in order to improve the safety of the scheme.

The problems identified have been noted in this report together with associated safety improvement suggestions which we would recommend should be studied for implementation. The audit has been carried out by the persons named below who have not been involved in any design work on this scheme as a member of the Design Team.

Norman Bruton **Signed:** 

(Audit Team Leader) **Dated: 8/9/2021**

Owen O'Reilly **Signed:** 

(Audit Team Member) **Dated: 8/9/2021**

Appendix A – Problem Location Map

Appendix B

Information Supplied to the Audit Team

- Drawing NRB-TA-001 Rev A
- Drawing NRB-TA-002 Rev A
- Drawing NRB-TA-003 Rev A
- Drawing NRB-TA-004 Rev A
- Drawing NRB-TA-005 Rev A
- For Information – Transport Assessment Report, NRB, April 2021.

Appendix C

Feedback Form

BRUTON CONSULTING ENGINEERS

BRUTON CONSULTING ENGINEERS

SAFETY AUDIT FORM – FEEDBACK ON AUDIT REPORT

Scheme: SHD, Blarney

Stage: 1 Road Safety Audit

Date Audit (Site Visit) Completed: 3-7-2020

Paragraph No. in Safety Audit Report	Problem accepted (yes/no)	Recommended measure accepted (yes/no)	Alternative measures (describe)	Alternative measures accepted by Auditors (Yes/No)
3.1 - Sunberry Heights Road Surface	Yes	Yes – The Road Surface/Texture will be discussed and agreed with Cork Co Council at detailed design stage, and the recommendations will be easily addressed.		
3.2 - Safety Barrier	Yes	Yes - It is proposed to replace the Barrier to modern requirements as shown on a separate OLS Engineering Drawing - Notwithstanding, a Risk Assessment can be undertaken, as recommended , if necessary, and a repaired or replaced safety barrier that meets current standards will then be provided - this will be dealt with at detailed design stage in consultation with Cork Co Co.		
3.3 - EW Ped Crossing	Yes	Yes - Drawings will be/are being revised and or annotated to address this in accordance with recommendations.		
3.4 - Footpath to rear of Parking spaces	Yes	Yes - The layout drawings will be/are being revised or annotated to show a footpath in accordance with recommendations.		
3.5 - Pedestrian Crossing	Yes	Yes - The layout drawings will be/are being revised or annotated to show a connecting pedestrian crossing as recommended.		

Observations

4.1 - Drainage - The Drainage will be addressed at detailed design stage, and normal standards dictate that surface water will be 'channelled' to gullies without standing water occurring

4.2 - Yellow Road Markings - The Markings can be reinstated as recommended in consultation with Cork Co Co.

BRUTON CONSULTING ENGINEERS

Signed
Design Team Leader

Date 07 Sept 2021

Signed.....
Audit Team Leader

Date.....8/9/2021

Signed.....
Employer

Date.....7/9/21

APPENDIX H

BUS SERVICES &
BUS CAPACITY ASSESSMENT REPORT

consulting engineers

NRB

Bus Services

&

Capacity Assessment Report

(Appendix H)

For

Proposed Residential Development

At

Sunberry Heights,

Blarney, Co Cork.

SUBMISSION ISSUE

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

Registered in Ireland No. 491679

Contents

Appendices.....

1.0 INTRODUCTION

1.1 NRB Consulting Engineers Ltd were appointed to address the Traffic & Transportation issues associated with the construction of a proposed residential development in Blarney, Co Cork. The scheme consists of a total of 105 private residential Housing Units, 38 Apartments and a small ancillary Crèche in the established town centre setting.

1.2 The NRB Commission includes this assessment of current & future Bus Capacity, a 'Bus Services & Capacity Assessment Report'.

1.3 The purpose of this Study is to review the potential impact of the development upon the existing and future bus services in the vicinity of the site.

1.4 The analysis of the existing and future bus services is based on an assessment methodology which includes trip generation assessment, modal split assumptions, and assignment/distribution. These assumptions have for the most part been based on real data extracted from the Central Statistics Office (CSO) 2016 Small Area Map Data, available through the online mapping tool. This data was used to quantify the anticipated demand for Buses as a result of the proposed development.

1.5 The first step was to review the current and future planned bus services. The bus stops within an easy walking distance of the subject site were identified, with the current bus services, bus service frequency and capacity studied and assessed.

1.6 Cork *Bus Connects* is expected to be implemented within the next decade. This initiative will reconfigure the bus services for Cork completely. This Study therefore considers both the existing bus network and the planned *Bus Connects* Network.

1.7 The Study focuses on the peak commuter periods, which represents the period of highest demand on the network consistent with the TII Traffic & Transport Assessment Guidelines (May 2014). It assumes that the trips will be assigned to the nearest available bus stops.

1.8 Whilst this Report contains an assessment of Bus Capacity, it should be remembered that Bus Operators are commercial in nature and services are generally provided based on demand. If there is an increased demand for services, or indeed if there is a deficit in a service provision, Operators generally react to improve facilities if it makes commercial sense to do so. More customers means more revenue generated.

2.0 BUS STOP LOCATIONS & BUS SERVICES (CURRENT & FUTURE)

CURRENT BUS SERVICES

2.1 For commuting, a walk distance to/ from Bus Stops of up to 1km is generally accepted as being acceptable. In the case of the subject site in Blarney, all of the nearby existing Bus Stops in Blarney are within an easy walk distance of the site. The Existing Bus Stop locations, together with the relevant Stop Reference Numbers, are as illustrated below as ***Figure 2.1***.

Figure 2.1 – Existing Bus Stops Nearby

2.2 All of the above existing Bus Stops are within an easy walk distance of the subject site. Google Street view walk distance/time feature, backed up by on-site measurements and checks, have been used to confirm the walking distance & time from the access to the subject lands. The walking distance from the Bus Stops to Sunbury Drive as a reference point, was confirmed as accurate, and is illustrated below as ***Figure 2.2*** and ***Figure 2.3***.

Figure 2.2 – 450m (5 min) Walk Distance to Bus Stop #213491 ('Blarney School')

Figure 2.3 – 500m (6 min) Walk Distance to Bus Stop #213501 ('Blarney Church')

2.3 The local Bus Stops are clearly within a very easy walk distance of the subject site, with a maximum walk time of 6 minutes from Sunbury Heights to any local stop. An image showing the existing facility provided at 'Blarney Church' together with the existing Bus Shelter for departing City Bound passengers is included below as ***Figure 2.4.***

Figure 2.4 – Existing Bus Stop Infrastructure at 'Blarney Church'

2.4 In terms of the Existing Bus Service Provision and Service Frequency, the site is served by Bus Service #215 which links Blarney with the City Centre and the range of other public and alternative transport services at the various hubs and interchanges. An extract from the Scheduled Service #215 (Cloghroe – Blarney – City – Mahon) timetable (accurate at the time of writing this Report) is included below as ***Figure 2.5.***

Blarney (Filling Station)	07:47	08:18	08:48	09:18	09:48	10:18	10:50	11:20	11:50	12:20	12:56	13:26	13:56	14:26	14:56	15:26	15:56
Blarney Village (Woolen Mills)	07:48	08:19	08:49	09:19	09:49	10:19	10:51	11:21	11:51	12:21	12:57	13:27	13:57	14:27	14:57	15:27	15:57
Blarney (St Anne's Road)	07:49	08:20	08:50	09:20	09:50	10:20	10:52	11:22	11:52	12:22	12:58	13:28	13:58	14:28	14:58	15:28	15:58
St. Annes Road (Pauls Cross)	07:50	08:21	08:51	09:21	09:51	10:21	10:53	11:23	11:53	12:23	12:59	13:29	13:59	14:29	14:59	15:29	15:59

Figure 2.5 – Extract Service #215 Timetable

2.5 Of course, there are Public Transport Apps that allow customers access up to date real information for Bus Arrivals and departures. Extracts from the Moovit App and Website are included below for information, which illustrate the type of information on Bus Arrivals and Departures on an individual stop basis for the entire day.

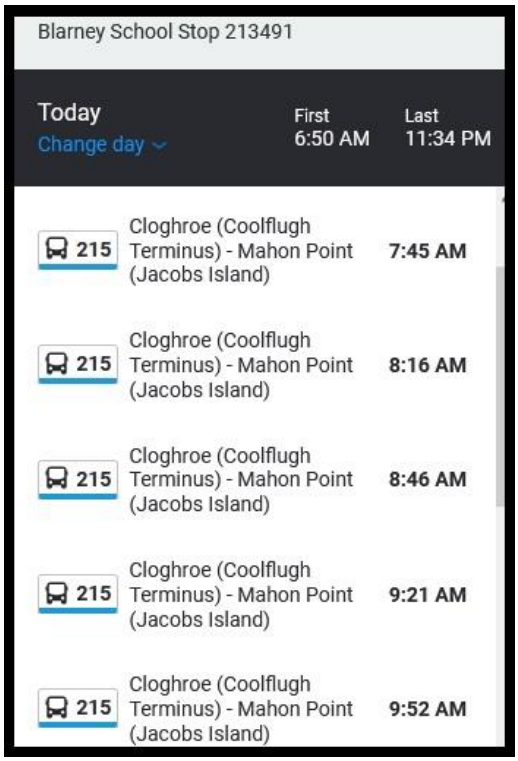


Figure 2.6 – Typical Moovit Extract (For Information)

2.6 The #215 Service consists of a fleet of high quality comfortable 'Double Decker' Buses, being accessible buses with 'low-floor' technology incorporated into their design. An image showing a typical #215 Bus is included as ***Figure 2.7.***

Figure 2.7 – #215 Double Decker Bus

2.7 The #215 Bus has a peak commuter period frequency of ~3 buses in each period. This provides the opportunity to connect Blarney residents to/from the City, but also creates a permeable service through connecting with the Greater Cork Public Transport Network. A Transport for Ireland Map of the network is included as ***Appendix A***, with an annotated extract below as ***Figure 2.8*** for ease of reference.

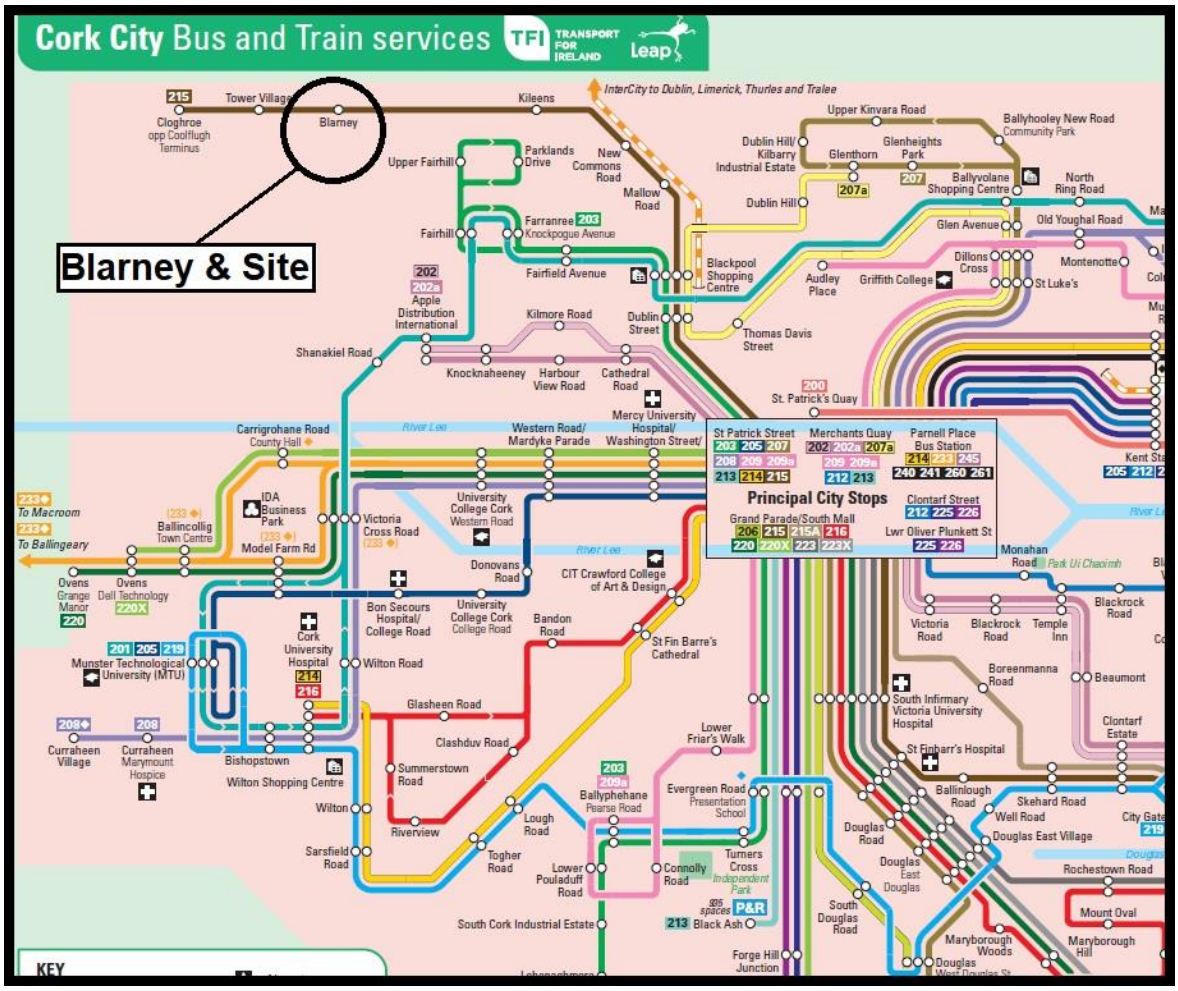


Figure 2.8 – Extract Cork City Bus and Train Services Network Map

FUTURE BUS SERVICES

2.8 As part of Cork Bus Connects, there is a proposed new route into the City, Blarney to Cork Bus Station via Kerry Pike, which will further facilitate access to/from the site and the City. The mid-day frequency for this potential future service is quoted at 120mins Monday to Saturday. There is no information available currently as to whether this frequency would be increased at peak commuter times. A map showing the current planned route for this service is included below as ***Figure 2.9***.

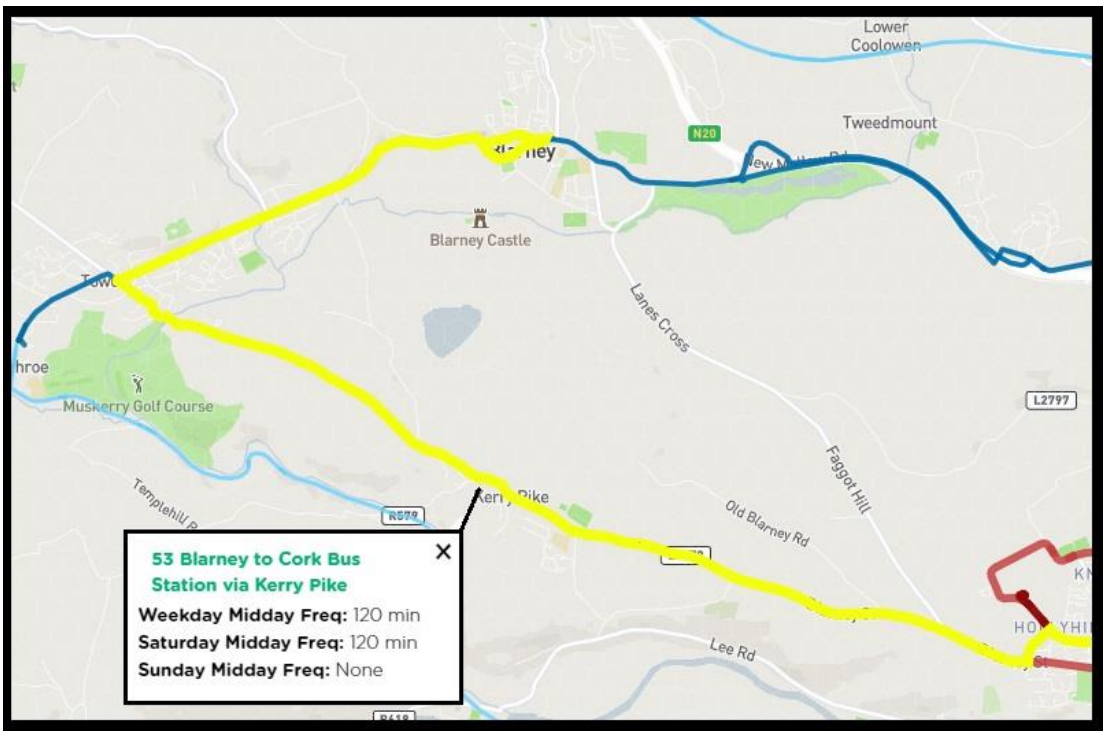


Figure 2.9 – Current Bus Connects Planned Service (Blarney-Cork-Blarney)

2.9 There is a further additional service also planned under Bus Connects, from Ballincollig to Blarney and onwards to/from the City Centre with a proposed frequency of 60 minutes throughout the day. A map showing the current planned route for this service is included below as ***Figure 2.10.***

Figure 2.10 – Current Bus Connects Planned Service (Ballincollig-Blarney-Ballincollig)

2.10 No further detail is available at the time of writing of this Report in relation to these services.

2.11 In terms of **Bus Passenger Capacity**, a typical Bus Eireann double decker bus has a capacity to accommodate ~90 passengers.

3.0 BUS USE PREDICTIONS, CAPACITY & DEMAND

3.1 We have used the CSO Local Small Area Mapping to establish the proportion of Bus Users within the area surrounding the site in order to estimate the additional demand for Buses. An annotated extract from the CSO Database used for this purpose is included below as ***Figure 3.1***

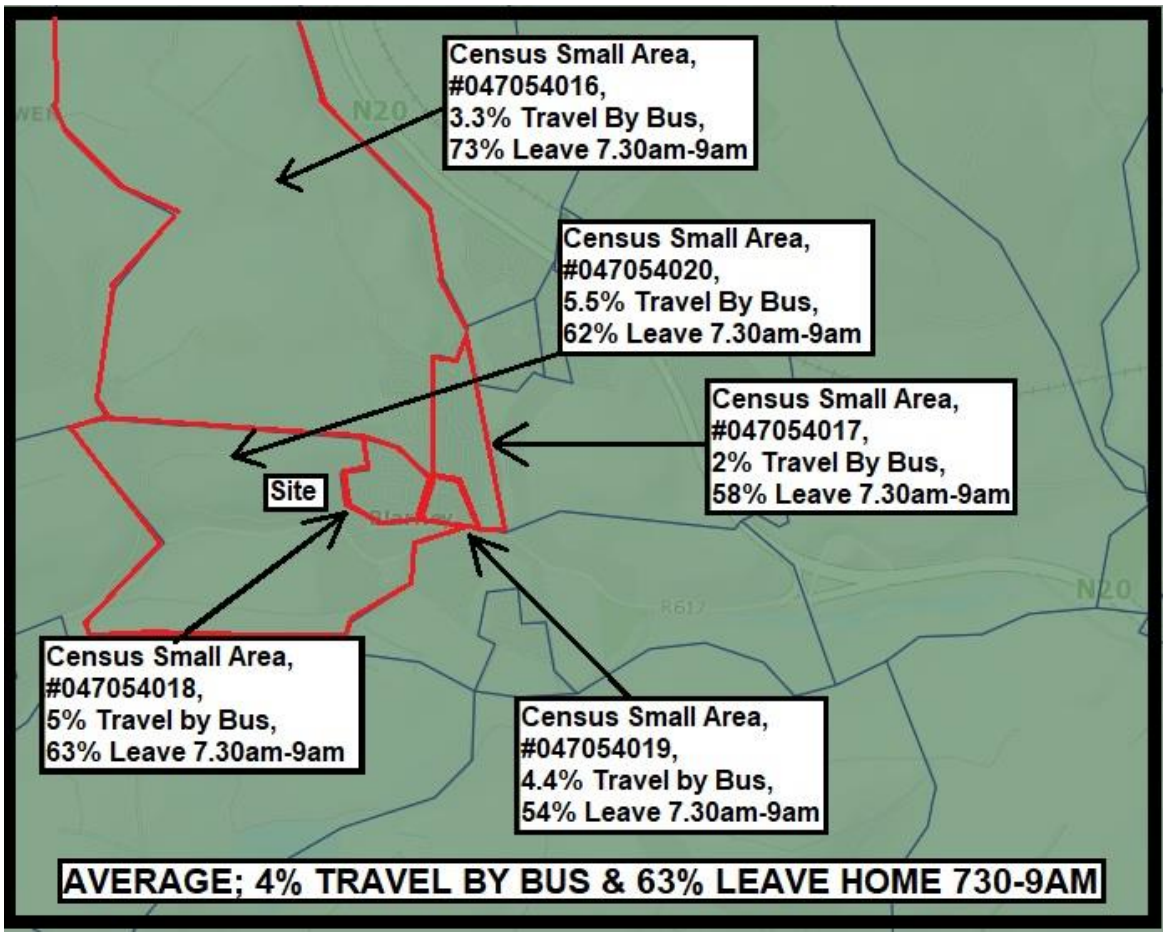


Figure 3.1 – Collated CSO Local Area Data

3.2 Utilising the CSO data, this confirms that on average 4% of people travel by Bus and 63% of these leave home at 730am to 9am. Utilising and interrogating the same Small Areas as illustrated above confirms that 58% of the population are aged 18+ and 61% of the total population are either students or working full time. It is expected that the proposed development will accommodate a total 'population' of 400 residents. Based on this information, an assessment of Capacity and Demand for Bus use can then be undertaken.

3.3 It is expected that the proposed development of 105 private residential Housing Units, 38 Apartments (and a small Creché) will together accommodate a maximum total of 400 residents. The resulting demand for bus seats has then been calculated using the information gathered from the CSO database in Figure 3.1 as illustrated and explained in **Table 3.1** below. Of course, there will possibly be a very low contra-flow demand for bus seats created by the small number of Creche Staff, a number which is considered by us to be negligible in the context of this calculation.

Table 3.1; Total Peak Commuter Hour Demand for Bus Seats Due to SHD Development

No. of New Residents	61% Of Which Residents are Working/Students	4% Travelling by Bus	63% Peak Period Commuters	Total Peak Period Demand for Bus Seats Created
400	244	10	7	7

BUS CAPACITY & DEMAND

3.4 Each of the existing Buses has a capacity for 90 people commuting on each service. There are 3 No. 215 bus services operating serving Blarney during each of the weekday AM and PM commuter peak periods. Based on CSO recorded Bus usage patterns locally, the proposed development will therefore create a demand for 2-3 seats per bus service travelling to and from Blarney.

3.5 A total requirement for 7 seats represents an increase in demand of 2.5%, and this should be considered in terms of the expected day-to-day variation of 10% in customer demand that traditionally occurs, and in terms of the increased uptake in Home-working which has reduced demand for commuting as a result of the Covid Pandemic. This demand can easily be accommodated within the existing #215 services based on our observation of current bus occupancy on the route adjacent the site. All observed #215 departing buses at the stops locally had 90%+ Empty Seats, with 7-8 max passengers awaiting a bus. This is unsurprising as Blarney is the start of the #215 route. Similarly, bus passengers to Blarney departing from the City would also benefit from being at the start of the route, with the resulting high seat-availability.

3.6 In Future, there are additional services to be created as part of Bus Connects as set out within Section 2.0 above. There will therefore also be more than adequate capacity on the further improved services for Blarney.

4.0 CONCLUSIONS

4.1 NRB Consulting Engineers Ltd were appointed to address the Traffic & Transportation issues associated with the construction of a proposed residential development in Blarney, Co Cork. The scheme consists of a total of 105 private residential Housing Units, 38 Apartments and a small ancillary Crèche in the established town centre setting.

4.2 The NRB Commission includes this assessment of current and future Bus Capacity, entitled 'Bus Services & Capacity Assessment Report'. The purpose of this Study is to review the potential impact of the development upon the existing and future bus services in the vicinity of the site serving Blarney.

4.3 The analysis of the existing and future bus services has been undertaken based on an assessment methodology which includes trip generation assessment, modal split assumptions, and assignment/distribution. These assumptions have been based on real data extracted from the Central Statistics Office (CSO) 2016 Small Area Map Data, available through the CSO online mapping tool. This data was used to quantify the anticipated demand for Buses as a result of the proposed development.

4.4 This Report contains details of current and future Bus Services and Bus Capacity serving the site and the Blarney Area.

4.5 The assessment confirms that the completion and full occupation of the development will result in an increased demand for bus seats, with an additional 7 customers during each of the weekday AM and PM Commuter peak periods. This represents a total of 2.5% of the number of bus seats or capacity available locally.

4.6 We conclude that the additional demand for Buses as a result of the proposed development can easily be accommodated on the existing and future improved bus services to/from Blarney.

4.7 Whilst this Report contains an assessment of Bus Capacity, it should be remembered that Bus Operators are Commercial Businesses, and services are generally provided based on demand. If there is an increased demand for services, or indeed if there is a deficit in a service provision, Operators generally react to improve facilities if it makes commercial sense to do so. More customers means more revenue generated.

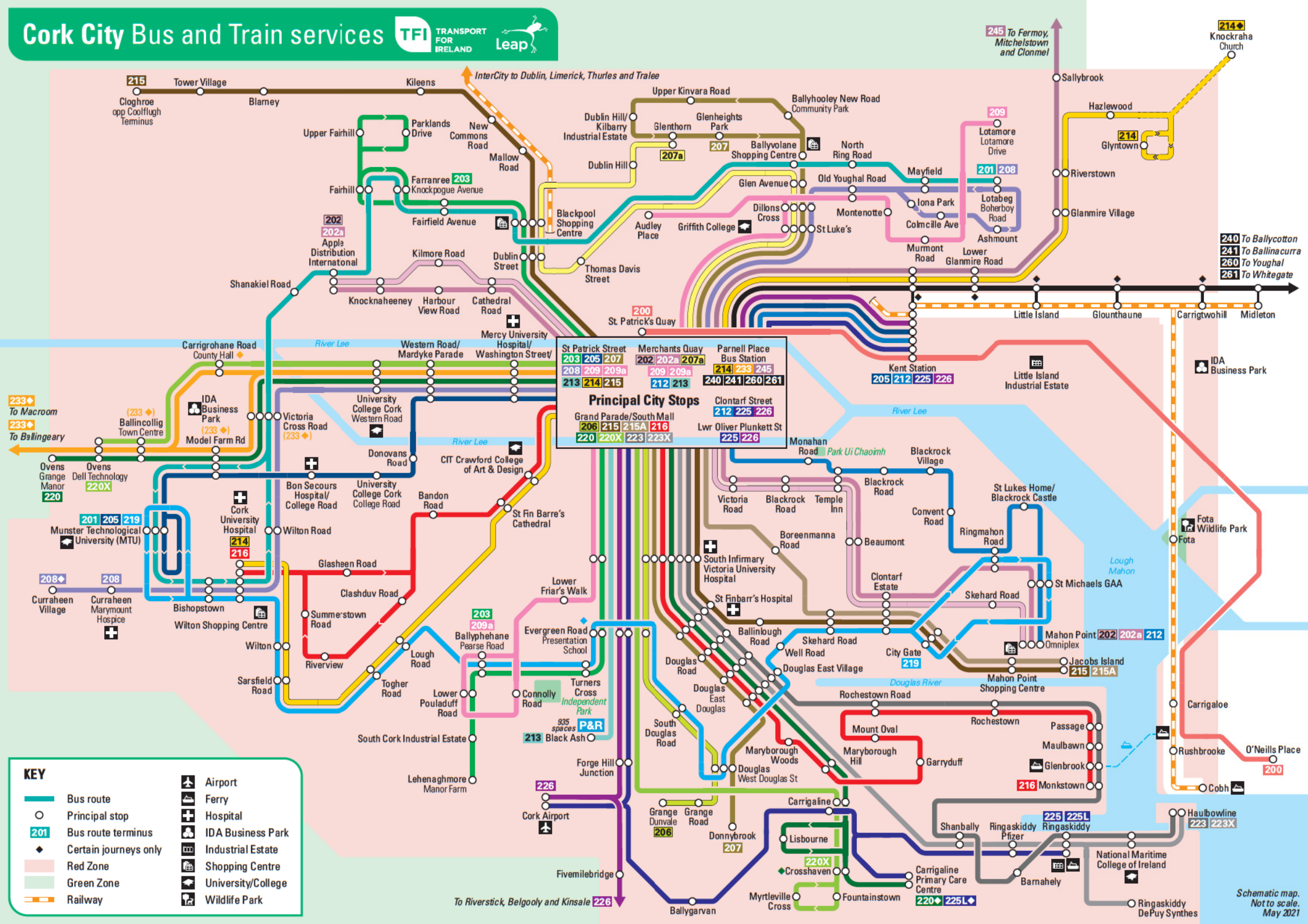
APPENDICES - CONTENT

APPENDIX A

Cork Bus/Rail Network Service Map

Cork City Bus and Train services

TFI TRANSPORT FOR IRELAND Leap



APPENDIX B

Bus Service #215 Details & Timetable

215 Cloghroe (Coolflugh Terminus) - Mahon Point (Jacobs Island)

View In Website Mode

The 215 bus line (Cloghroe (Coolflugh Terminus) - Mahon Point (Jacobs Island)) has 2 routes. For regular weekdays, their operation hours are:
(1) Cloghroe (Coolflugh Terminus) - Mahon Point (Jacobs Island): 6:30 AM - 11:30 PM (2) Mahon Point (Jacobs Island) - Patrick Street: 6:35 AM - 11:35 PM
Use the Moovit App to find the closest 215 bus station near you and find out when is the next 215 bus arriving.

Direction: Cloghroe (Coolflugh Terminus) - Mahon Point (Jacobs Island)

47 stops
VIEW LINE SCHEDULE

- Cloghroe Stop 213421
- St Philomena's Cres Stop 213431
- Tower Village Stop 213441
- St Annes Hill Stop 213451
- Riverview Estate Stop 213461
- St Annes Road Stop 213471
- Pauls Cross Stop 213481
- Blarney School Stop 213491
  Saint Anns Road, Blarney
- Blarney Church Stop 213501
- Blarney Stop 213511
- Killeens Stop 213521
- Sunset Place Stop 213531
- Commons Road Stop 213541
- Mallow Road Junction Stop 213551
- The Commons Inn Stop 213561
- West Link Stop 255131
- Redforge Road Stop 255161

215 bus Time Schedule

Cloghroe (Coolflugh Terminus) - Mahon Point (Jacobs Island) Route Timetable:

Sunday	8:30 AM - 11:30 PM
Monday	6:30 AM - 11:30 PM
Tuesday	6:30 AM - 11:30 PM
Wednesday	6:30 AM - 11:30 PM
Thursday	6:30 AM - 11:30 PM
Friday	6:30 AM - 11:30 PM
Saturday	6:30 AM - 11:30 PM

215 bus Info

Direction: Cloghroe (Coolflugh Terminus) - Mahon Point (Jacobs Island)
Stops: 47
Trip Duration: 61 min
Line Summary:

Dublin Street Stop 243551

Thomas Davis Street Stop 243561
Corkeran's Quay, Cork

Watercourse Road Stop 242631
Watercourse Road, Cork

Constellation Bar Stop 242601

Camden Quay Stop 237001
Camden Quay, Cork

St Patrick's Street Stop 241201
Saint Patrick Street, Cork

Princes Street Stop 240501
47 Saint Patrick's Street, Cork

Grand Parade Stop 242751
Grand Parade, Cork

South Mall Stop 241211
21 Cook Street, Cork

Cork City Hall Stop 250841

Southern Road Stop 241221
Thomond Square, Cork

Douglas Road Stop 241231

Laurel Grove Stop 241241

Ballinlough Road Stop 242761

Ballinlough Church Stop 210031

Ballinlough Comm Ctr Stop 242781

Sundrive Park Stop 242791

Shrewsbury Estate Stop 242801

Carrigmore Park Stop 242811

Churchyard Lane Stop 242821
The Village Green, Cork

Skehard Road Stop 235911

Ashleigh Rise Stop 242831

Clover Lawn Stop 242841

Clontarf Estate Stop 242851

Skehard Lawn Stop 242861
Ballinsheen Road, Cork

Mahon Point Road Stop 242871

City Gate Stop 242881

Mahon Point Stop 242891

Jacobs Island Stop 242911

The Sanctuary Stop 242901

Direction: Mahon Point (Jacobs Island) - Patrick Street

48 stops

VIEW LINE SCHEDULE

The Sanctuary Stop 242901

Jacobs Island Stop 242921
The Courtyard, Ireland

Mahon Point Stop 213201

City Gate Stop 242941

Cso Cork Stop 242951

Skehard Road Stop 242961

Clover Lawn Stop 242971

Old Cliff Stop 242981

Park Hill Stop 242991

Churchyard Lane Stop 288821
Churchyard Lane, Cork

Ballinlough Road Stop 288811

Shrewsbury Estate Stop 243001

Sundrive Park Stop 243011

Ballinlough Centre Stop 243021

Pic Du Jer Park Stop 243161

Lady Of Lourdes Stop 243031

Knockrea Lawn Stop 243041

Belair Junction Stop 241441

St Finbarr's Hosp Stop 213911

Southern Road Stop 241451
Douglas Road, Cork

Infirmary Road Stop 240901
Newenham Terrace, Cork

South Terrace Stop 240911
South Terrace, Cork

Georges Quay Stop 240921
George's Quay, Cork

215 bus Time Schedule

Mahon Point (Jacobs Island) - Patrick Street Route Timetable:

Sunday	8:00 AM - 11:30 PM
Monday	6:35 AM - 11:35 PM
Tuesday	6:35 AM - 11:35 PM
Wednesday	6:35 AM - 11:35 PM
Thursday	6:35 AM - 11:35 PM
Friday	6:35 AM - 11:35 PM
Saturday	7:30 AM - 11:35 PM

215 bus Info

Direction: Mahon Point (Jacobs Island) - Patrick Street
Stops: 48
Trip Duration: 63 min
Line Summary:

Cork City Library Stop 241461
Grand Parade, Cork

Drawbridge Street Stop 241991
118 Saint Patrick's Street, Cork

Upper John Street Stop 242331

Watercourse Road Stop 242341

Blackpool Health Ctr Stop 242351
38 Madden's Buildings, Cork

Blackpool Church Stop 242661
Corkeran's Quay, Cork

Dublin Street Stop 242361

Dublin Hill Junction Stop 242371

Redforge Road Stop 255141

Mallow Road Stop 255151

The Commons Hotel Stop 213271

Commons Road Stop 213281

Sunset Place Stop 213291

Kileens Village Stop 212611

Blarney Stop 213301

Blarney Church Stop 213311

St Annes Road Stop 213321
Saint Ann's Road, Blarney

Pauls Cross Stop 213331

St Annes Hill Stop 213341
Willison Meadows, Ireland

Riverview Estate Stop 213351

Matanatha Stop 213361

Primrose Hill Stop 213371

Tower Village Stop 213391

St Philomena's Cres Stop 213401

Cloghroe Stop 213411

215 bus time schedules and route maps are available in an offline PDF at moovitapp.com. Use the Moovit App to see live bus times, train schedule or subway schedule, and step-by-step directions for all public transit in Ireland.

Check Live Arrival Times