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PROPOSED HOUSING DEVELOPMENT AT BALLINDERRY ROAD

MULLINGAR, COUNTY WESTMEATH

TRAFFIC AND TRANSPORT ASSESSMENT

FINAL – REVISION G – FEBRUARY 18th 2022

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1 INTRODUCTION

1.1 Purpose of report

An SHD planning application is being submitted to An Bord Pleanala for planning permission to construct a housing development on a vacant site located on the west side of the L1132 Ballinderry Road in the south side of Mullingar, County Westmeath. The proposed development consists of 130 dwellings of mixed type. A detailed description of the site location and context is provided in the Statement of Consistency submitted with the application.

This report presents the method and results of a ***Traffic and Transport Assessment*** undertaken in order to determine the likely traffic impacts of the proposed development on the local highway network.

The report addresses the following traffic and transport related issues:

- The local highway network,
- Observed base year 2019, opening year (2024) and future year (2039) background traffic levels,
- Additional traffic volumes that will be generated by the proposed housing development,
- The assignment of the additional traffic generated by the proposed development onto the local highway network,
- Design of the access junction with the L1132 Ballinderry Road and the internal road and cycle network,
- Capacity assessment of the proposed access junction on L1132 Ballinderry Road,
- Access for sustainable modes of transport,
- Road Safety.

The study was commissioned by the scheme promoters Consdorf Investment ICAV, and was undertaken by Alan Lipscombe Traffic and Transportation Consultants Ltd.

1.2 Method and report structure

The report adopts the guidance for such assessments set out by Transport Infrastructure Ireland (TII)[1] and is set out as follows:

[1] Traffic and Transport Assessment Guidelines (PE-PDV-02045) TII, May 2014

- A review of the existing transport infrastructure in the vicinity of the proposed development, including an assessment of existing and future traffic flows ***(Section 2 - Receiving Environment)***,
- A description of the nature of the proposed development and the traffic volumes that will be generated ***(Section 3 – Proposed Development)***,
- A description of the proposed access junction and internal layout, together with a swept path analysis ***(Section 4 – Access junction and internal layout)***,
- A review of the impact of the development on the surrounding network ***(Section 5 – Impact of the proposed development on surrounding network)***,
- A review of the impacts and mitigation measures during construction ***(Section 6 – Traffic impacts during construction)***,
- A review of conditions for sustainable modes of travel ***(Section 7 – Provision for sustainable modes of travel).***
- A review of Road Safety issues, including a summary of the independent Stage 1 Road Safety Audit ***(Section 8 – Road Safety).***

The key findings of the assessment are summarised in the concluding Chapter 9.

1.3 Summary of changes resulting from consultation with An Bord Pleanala and Westmeath County Council

As part of the SHD process a tripartite meeting was held on Wednesday 27th September 2021, where the Applicants design team received feedback relating to the proposed development from An Bord Pleanala and Westmeath County Council. In relation to traffic and transport issues, comments were received at the meeting, and subsequently in the Inspector's Report on Recommended Opinion (ABP-310247-21) with respect to the following matters;

- A recommendation to reconsider the function and horizontal alignment of the "New Avenue" Link Street, in relation to DMURS,
- Consider options for the design of the cycle facilities in relation to National Cycle Manual and DMURS,
- Revisit cross section of route, including carriageway width, cycle facilities, verges, parallel parking and footways,
- Ensure continuous pedestrian connectivity with development land to the west,
- Consider options for pedestrian crossings at minor junctions,
- Recommendation to remove chicanes from local road network.

Each of these issues raised during the consultation process are addressed in this report.

Other changes made during the preparation of this revised assessment are,

- The proposed development content is reduced from 136 dwellings to 130 dwellings.
- The assessment years in terms of background traffic flows on the L1132 Ballinderry Road were updated from an assumed development opening year of 2022 to 2024, and a future assessment year from 2037 to 2039.

During the interim period traffic volumes have been significantly impacted by government travel restrictions as a result of the Covid-19 pandemic. It is, however, noted that base year traffic flow data on which this assessment is based was collected in June 2019, prior to the pandemic, and therefore remains relevant.

2 RECEIVING ENVIRONMENT

2.1 Location and network summary

The proposed residential development site is located on the west side of the L1132 Ballinderry Road approximately 1.7 kms south of Mullingar Town Centre and 1km north of the L1132 / N52 Ballinderry Road roundabout. The proposed development is shown in the context of the existing road network in Figure 1a, with the site layout plan prepared by the project designers (Coughlan Associates Architects and Doyle + O'Troithigh Landscape Architects), included as Appendix A.

The primary land use along the L1132 Ballinderry Road between the proposed site access and Mullingar Town Centre is residential, with access roads for residential estates provided off the road, in addition to single dwellings with direct access onto the Ballinderry Road.

While the L1132 Ballinderry Road provides direct access to the N52, existing traffic volumes are low, as discussed in Section 2.2, with the majority of traffic wishing to access the N52 utilising the R156 and R400 connections located to the north and south of the L1132 Ballinderry Road respectively.

It is noted that while there is a continuous footpath on the eastern side of the L1132 Ballinderry Road linking into Mullingar, there is currently no footpath on the western side to the north of the propose access junction. This will be remedied with the construction of the proposed development, which includes a section of footpath on the western side of the L1132 Ballinderry Road connecting into the existing footpath to the north of the site, as shown in the proposed layout included for information as Appendix A.

Isochrones radiating from the site are shown for 0.5km, 1.0km and 2.0 kms in Figure 1b. The figure indicates that there will be a continuous pedestrian link with Mullingar Town Centre and much of its amenities (including schools) which are within 2.0kms, or 24 minutes' walk from the proposed site. It is noted that local shops are located within 1.0km, or 12 minutes' walk, with a crèche located within 0.5 km, or 6 minutes' walk.

The existing setting is shown in Plates 1 to 3 appended to the back of this report.

Figure 1a Site location

Source: Bing Maps

2.2 Existing and future traffic flows

Observed 2019 flows

Peak period classified traffic counts and a speed survey were undertaken by Traffinomics Surveys Ltd on the L1132 Ballinderry Road at the location of the proposed access junction for the proposed housing development. The survey took place on Thursday 13th June, 2019, with the observed counts shown in terms of passenger car equivalent units (pcus) in Figure 2 for the AM and PM peak hours respectively, with the following the main points to note;

- The AM peak hour was observed to be 08:00 to 09:00 and the PM peak hour 17:00 to 18:00,
- While traffic volumes on the Ballinderry Road were observed to be light during all time periods, 2-way traffic flows were observed to be greater during the PM peak hour compared to the AM peak hour with 2-way flows of 139 pcus observed in the former, and 207 pcus in the latter.

- During both periods traffic flows were observed to be slightly higher in the northbound direction travelling towards Mullingar Town Centre, comprising of 54% of the 2-way flow during the AM peak hour and 53% during the PM peak hour.

These traffic counts were adopted as base flows for the purpose of the junction capacity tests discussed in Section 5 of this report. A full listing of the traffic counts and speed survey undertaken at the location of the proposed development access on the Ballinderry Road is provided in Appendix B. The results of the speed survey are discussed in Section 4.1.

A review of continuous Automatic Traffic Count (ATC) sites maintained by Transport Infrastructure Ireland (TII) indicates that a count on the N52 just to the north of Ballinderry Road in Mullingar is the most appropriate available source of continuous seasonal traffic count data. Data from 2018 shows that the month of September was recorded to be the busiest with traffic flows observed to be 6.9% higher than the survey month of June. The observed traffic flows were therefore seasonally adjusted by +6.9% to represent the busiest month, with these traffic flows shown in Figure 3 for the AM and PM peak hours. The TII data for the N52 counter is included as Appendix C.

Opening year 2024 and future year 2039 traffic forecasts

For the purpose of the traffic assessment it is assumed that the proposed housing development will open and be occupied in the year 2024. In addition to the opening year, in accordance with TII guidelines, the capacity assessment was also based on traffic conditions forecast for the year 2039, 15 years after it is proposed that the development will open.

Opening year 2024 and future year 2039 traffic volumes on the L1132 Ballinderry Road were derived by applying a growth factor to the seasonally adjusted traffic counts of 2019. Annual growth indices were updated in May 2019 by TII[2], with annual indices and cumulative growth forecasts shown for County Westmeath in Table 1. The derived growth factors applied to 2019 flows to determine background traffic flows for the study years are shown in Table 2. Based on TII growth factors for cars and light vehicles for the medium growth scenario, traffic is forecast to grow by 8.3% between 2019 and 2024, and by 24.8% between 2019 and 2039. These growth estimates were adopted for the purpose of this assessment. Background traffic forecasts for the years 2024 and 2039 are shown in Figures 4 to 5 respectively.

It is noted that the forecast opening year of 2024 could vary by 1 or 2 years, depending on the duration of the planning process. However, with background traffic growth forecast to increase by just 0.62% per annum by the future year 2039, the findings of this assessment would remain the same.

[2] *Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections, May 2019*

Table 1 TII traffic growth indices, County Westmeath

Year	Lights - Annual factor			Lights - Cumulative index		
	low	Medium	High	low	Medium	High
2019	1.0145	1.0161	1.0194	1.000	1.000	1.000
2020	1.0145	1.0161	1.0194	1.015	1.016	1.019
2021	1.0145	1.0161	1.0194	1.029	1.032	1.039
2022	1.0145	1.0161	1.0194	1.044	1.049	1.059
2023	1.0145	1.0161	1.0194	1.059	1.066	1.080
2024	1.0145	1.0161	1.0194	1.075	1.083	1.101
2025	1.0145	1.0161	1.0194	1.090	1.101	1.122
2026	1.0145	1.0161	1.0194	1.106	1.118	1.144
2027	1.0145	1.0161	1.0194	1.122	1.136	1.166
2028	1.0145	1.0161	1.0194	1.138	1.155	1.189
2029	1.0145	1.0161	1.0194	1.155	1.173	1.212
2030	1.0042	1.0062	1.0101	1.160	1.180	1.224
2031	1.0042	1.0062	1.0101	1.165	1.188	1.236
2032	1.0042	1.0062	1.0101	1.169	1.195	1.249
2033	1.0042	1.0062	1.0101	1.174	1.203	1.262
2034	1.0042	1.0062	1.0101	1.179	1.210	1.274
2035	1.0042	1.0062	1.0101	1.184	1.218	1.287
2036	1.0042	1.0062	1.0101	1.189	1.225	1.300
2037	1.0042	1.0062	1.0101	1.194	1.233	1.313
2038	1.0042	1.0062	1.0101	1.199	1.240	1.327
2039	1.0042	1.0062	1.0101	1.204	1.248	1.340

Source: TII Project Appraisal Guidelines - Unit 5.3, May 2019

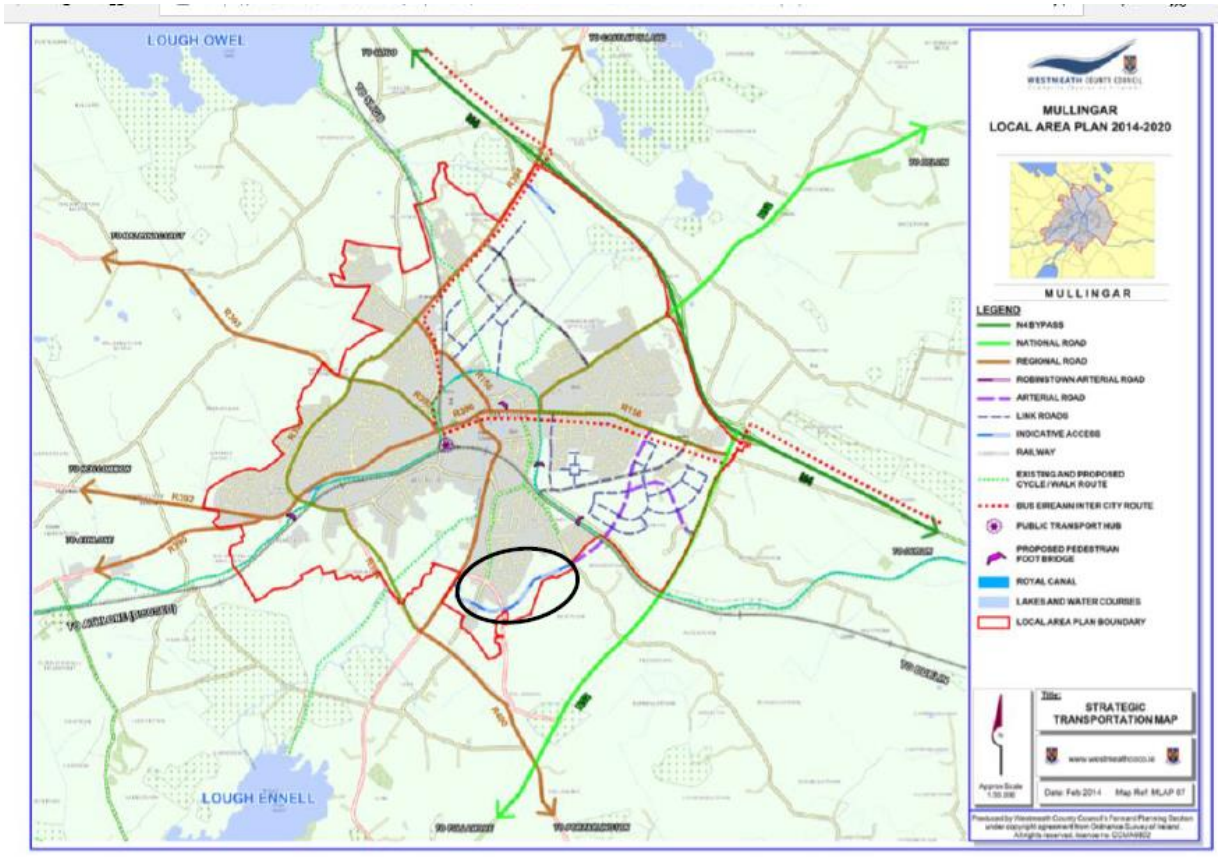
Table 2 Derived TII traffic growth rates, County Westmeath

Period	Factors		
	low	Medium	High
2019 – 2024	1.075	1.083	1.101
2019 - 2039	1.204	1.248	1.340

2.3 Future environment

From a review of the Mullingar Local Area Plan 2014 – 2020, and in particular the "Strategic Transportation Map" (inserted below), and from discussions with Westmeath County Council during the pre-planning process, it is proposed by the council that any new access road linking into the west side of L1132 Ballinderry Road at the location proposed as part of this application would be required to facilitate potential additional development to the west of the subject site. While no details of the content or scale of the additional development are available, a sensitivity test was undertaken in order to determine the potential traffic impact of the development of these lands, as set out in the junction capacity assessment included as Section 5 of this report.

Strategic Transportation Map, Mullingar Local Area Plan, 2014 - 2020



3 PROPOSED DEVELOPMENT

3.1 Proposed development content and trip generation

The proposed development comprises of a total of 130 dwellings, broken down as follows;

- 4 bedroom semi-detached houses = 33 units
- 3 bedroom semi-detached houses = 27 units
- 3 bedroom townhouses = 34 units
- 3 bedroom duplex units = 13 units
- 2 bedroom apartments = 23 units
- Total = 130 units

The development content, peak hour trip rates per dwelling and additional peak hour trip estimates are shown in Table 3.

The number of additional trips that will be generated during the AM and PM peak hours by each new dwelling may be determined from the TRICS database or from observations at existing residential developments. A review of the TRICS data base suggested that during the AM peak hour 0.22 car trips per household will arrive at each dwelling and 0.47 trips would leave each house, while corresponding figures of 0.51 and 0.3 were established for the PM peak hour.

In order to allow for site variation and a factor of safety it was assumed that each dwelling in the proposed site would generate 0.3 arrival car trips during the AM peak hour with 0.6 departure trips during the same hour. A reverse of 0.6 arrival trips per house and 0.3 departure trips was assumed for the PM peak hour. As shown in Table 3, based on these assumptions, with the introduction of the proposed development it is estimated that a total of 39 additional trips will arrive at the proposed development on Ballinderry Road during the AM peak hour, with 78 car trips leaving during the same hour. During the PM peak hour it is estimated that 78 trips will arrive at the proposed development while 39 trips will exit the site onto Ballinderry Road.

Table 3 Trip rates and generated trips for proposed residential development

Use	Content	Trip rates				Trips			
		AM		PM		AM		PM	
		in	out	in	out	in	out	in	out
Mixed dwellings	130	0.30	0.60	0.60	0.30	39	78	78	39

3.2 Traffic assignment

For the purpose of testing the impact of the additional traffic generated by the proposed residential development on the proposed access junction on the L1132 Ballinderry Road it was assumed that traffic would access and exit the site in the same proportions as the directional flows observed during the traffic surveys. The additional turning movements generated by the proposed development are shown on this basis in Figure 6.

The "with development" flows for the opening year 2024 and future year 2039 are set out in Figures 7 and 8. Traffic flows for the future year 2039, based on 3 times the forecast trip generation for the subject development, are set out in Figure 9 in order to test the potential of the junction to provide for additional development located to the west of the subject site. These traffic flows were used for the purpose of the junction capacity tests discussed in Section 5.

4 ACCESS JUNCTION AND INTERNAL LAYOUT

4.1 Proposed access junction on the L1132 Ballinderry Road

The proposed development will be accessed from the L1132 Ballinderry Road via a proposed simple priority junction as shown in Figure D1 of Appendix D. The proposed junction includes a 6m wide road accessing the proposed development and 6m junction radii in accordance with DMURS. Junction markings shown on the plan are in accordance with STOP markings and signs shown for a minor arm of a priority junction as set out in Figure 7.35 of the Traffic Signs Manual (TSM).

The access junction layout proposed as set out in Figure D1 includes the provision of a raised pedestrian crossing of the proposed link street to facilitate pedestrians crossing the junction on the west side of the L1132 Ballinderry Road. This arrangement is discussed further in Section 4.2 and is common to the pedestrian provision proposed at the internal junctions within the site. Depending on the potential for additional development located to the south of the subject development site that would generate additional pedestrian activity on this route, this could be replaced with dropped kerbs only to facilitate pedestrians crossing at this location if requested by Westmeath County Council.

As there are no cycle lanes on the L1132 Ballinderry Road at present it is necessary to stop the cycle lanes proposed for the link street accessing the proposed development prior to the junction, as shown in Figure D1. It was considered that this was a safer arrangement than bringing the cycle lane up to the stop line, where cyclists would be immediately turning onto an environment where there was no specific cycle provision. This layout could be updated in the event that cycle lanes are introduced by Westmeath County Council on the L1132 Ballinderry Road.

The speed limit on the L1132 Ballinderry Road is 50 km/h, although speeds observed on site appeared to exceed the limit. This was confirmed by the speed surveys undertaken as part of the assessment (and included as Appendix B) which show that 85th percentile speeds of 70 km/h were observed in both directions (69.7 km/h northbound and 71.3 km/h southbound). While it is likely that the extension of the urban environment and new access junction on the L1132 Ballinderry Road following the construction of the proposed development will have a traffic calming effect on this section of the L1132 Ballinderry Road, the following measures are recommended as mitigation measures;

- The introduction of speed monitoring sign which indicates speed to driver and advises speed reduction when over 50 km/h,

- The provision of 3m x 120m visibility splays in accordance with a 70 km/h design speed as set out in TII Guidelines[3].

The 3m x 120m visibility splays available are shown in both the horizontal and vertical planes in Drawing N0 C102 PL4 included in the submission made the Project Engineers, SDS Design Engineers.

An informal courtesy type crossing is proposed across the L1132 Ballinderry Road to provide pedestrian connectivity with the existing Newtown Lawns residential development located on the east side of the L1132 Ballinderry Road. The informal courtesy crossing will comprise dropped kerbs and tactile paving and will be undertaken in agreement with WMCC.

4.2 Internal layout

Proposed street hierarchy and design

The proposed development road network, together with road markings and signs is shown in Figure D2 of Appendix D of this report. Details of all dimensions, including road widths, junction radii, footpath width and parking space dimensions are provide in Drawing No 4 - Site Layout Dimensions, included as part of the submission presented by the Project Architects, Coughlan Associates Architects.

It is proposed that vehicle access to/from and through the site, is provided via a new road with cycle lanes and verges that traverses the site providing connectivity between L1132 Ballinderry Road through to the potential development lands situated to the west. Local streets then connect with this road via simple priority type junctions providing access to the main residential areas located in the proposed development.

One significant change to the scheme being presented in this current application compared to the previous version presented during the consultation process is the treatment of the main vehicular route that traverses the site. Due to the relatively low traffic volumes that this road will provide for, this route was originally considered to be local in nature, with various bends included in the horizontal alignment to self-enforce low speeds through the residential development, as recommended for local streets in DMURS. Following feedback received during the SHD consultation process, together with further consultations with Westmeath County Council's Road Section, it was subsequently agreed that this road should be considered to be a "Link Street" in the context of DMURS, as is presented in the site layout plan. Relevant recommendations presented

[3] DN – GEO – 03060, Geometric Design of Junctions, TII, April 2017

in DMURS in relation to the design and alignment of the Link Street, and adopted in the design process, include the following;

Carriageway width of Link Street

Vehicle lane widths of 2 x 3m lanes are proposed (as per Figure 4.55 of DMURS).

Horizontal alignment of Link Street

In relation to horizontal alignment, the proposed link street is now relatively straight, with gentle deflection provided at 2 locations in the centre of the site. This is in accordance with recommendations in set out in section 4.4.6 of DMURS which states the following;

- *"Designers should avoid major changes in the alignment of Arterial and Link Streets as these routes will generally need to be directional in order to efficiently link destinations",*
- *"Major changes in horizontal alignment of Arterial and Link Streets should be restricted to where required in response to the topography and constraints of a site",*
- *Designers should not rely on curvature alone to reduce speeds. Changes in horizontal alignment should be combined with contextual measures that reduce forward visibility, such as building lines and on-street parking.*

Based on the above it is concluded that the proposed alignment of the link street that traverses the site, with gentle deflection at 2 locations, with on-street parking and revised building and tree lines, as shown in Figure D2, meets all of these design criteria set out in DMURS.

Design of cycle facilities

There are various types of cycle provision that were considered, including options for segregated cycle-ways, provision of a 2-way cycle lane on one side of the road, and directional cycle lanes provided on each side of the Link Street. Segregated cycle lanes were ruled out for the following reasons;

- It was considered that divergence of a cycle facility from the alignment of the Link Street through the site would provide unnecessary diversion from the likely desire lines of cyclists, and,
- It was considered that the proposed local street network provides more than adequate connectivity off the link street to all destinations in the development.

The proposed option is to provide cycle lanes adjacent to each side of the road, in strict accordance with guidance set out in the National Cycle Manual (NCM)[4], as described below.

[4] National Cycle Manual, NTA

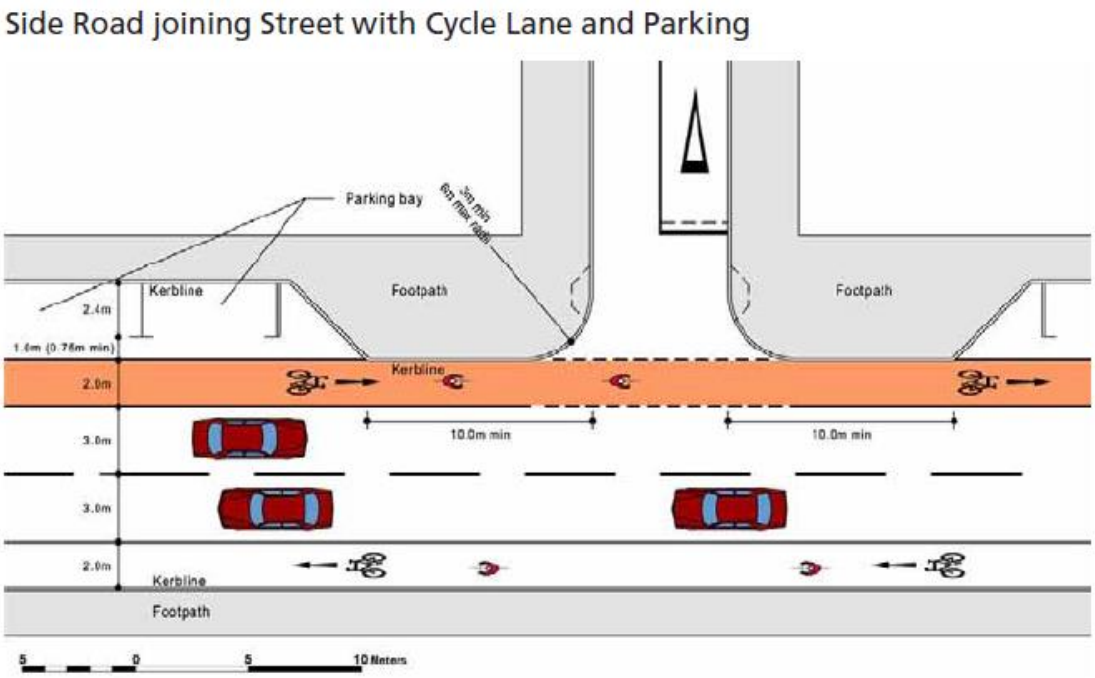
Cross-section of link street

The cross section of the proposed link road is as presented in page 138 of the National Cycle Manual, as overleaf for information. This prescribed layout is considered to be the optimum fit for the proposed link street, taking account of the provision of cycle-lanes in each direction, the class of the roads considered, including junctions with local streets, and the presence of on-street parking.

While details of the cross section are provided in Drawing No C131 PL3 included in the submission prepared by the Project Engineer, SDS Design Engineers, the proposed dimensions in accordance with the NCM are; 2 x 3m traffic lanes, 2 x 1.75m cycle lanes and at locations where there is parallel parking, a buffer strip between the parking spaces and the cycle lanes of 0.75m to allow for opening car doors. Also in accordance with the NCM, it is proposed that there will be a 50mm kerb segregating the cycle lane from the main carriageway.

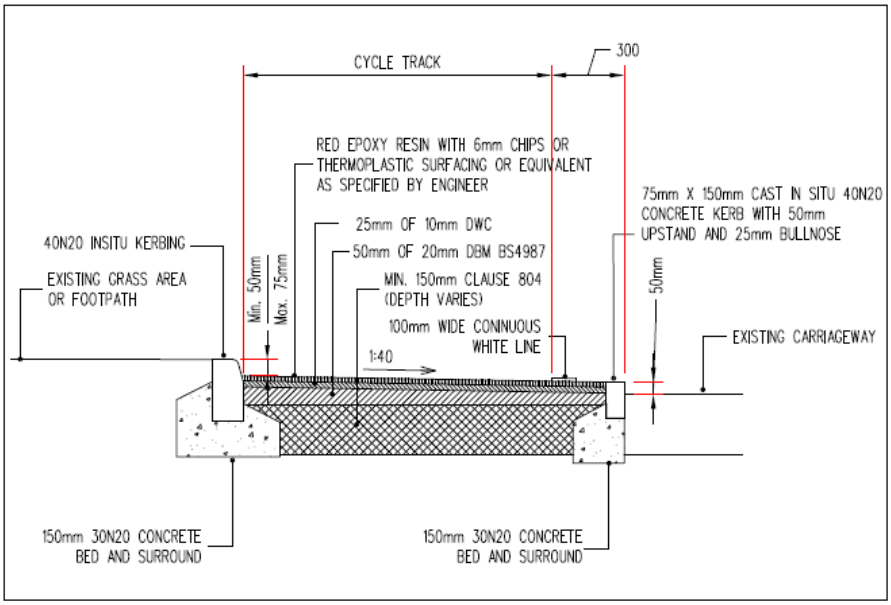
It is proposed that there will be one crossing of the link street which takes the form of a courtesy type crossing with dropped kerbs, with the crossing of the link street at the same level as the carriageway. The location of the crossing is shown in Figure D2.

Extract from National Cycle Manual – page 138



Extract from National Cycle Manual – page 192

Cycle Lane Construction

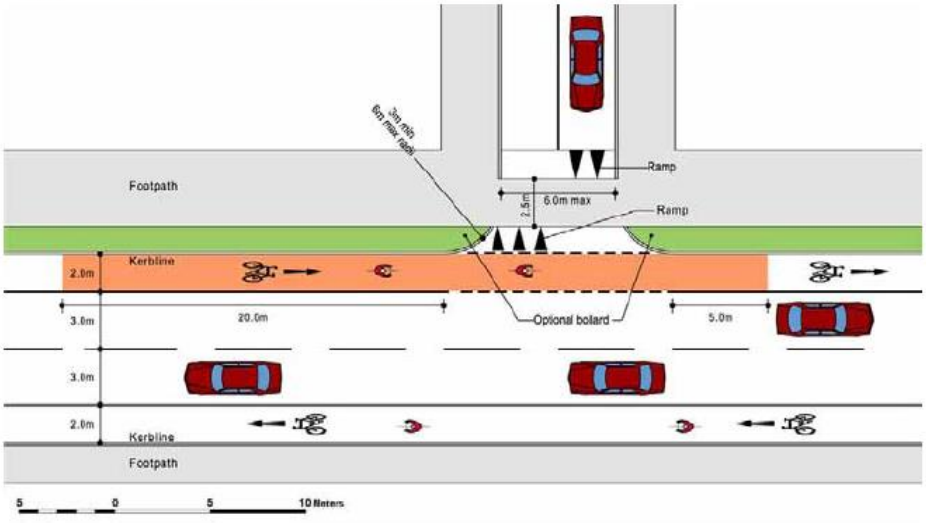


Design of internal priority junctions

The internal junctions between the link street and the local streets are simple priority junctions, with 4m junction radii. It is proposed that pedestrians are given priority across the link streets, in accordance with the layout set out in page 136 of the NCM, as shown in the extract below.

Extract from National Cycle Manual – page 136

Minor Side Road with Pedestrian Priority



Road markings and signage

All road markings and signs proposed for the development are shown in Figure D2, and are in accordance with the Traffic Signs Manual as follows;

Markings and signs at priority junctions are as per Figure 7.35 of the Traffic Signs Manual, including;

- Centreline RM 001,
- STOP line RRM 017, and,
- STOP lettering M114,
- STOP sign RUS 027.

Speed limit signs for 50 km/h (RUS 043) and 30 km/h (RUS 044) are provided on the links street local streets respectively.

Cycle lane markings and signs (RUS 009) are provided along the length of the cycle lane with an END sign (PO101) provided where the cycle lane ends at the junction with the L1132 Ballinderry Road.

Other design features in line with DMURS are as follows;

- All footpaths and pedestrian crossings are a minimum of 1.8m wide,
- All crossing points on the local street network have buff coloured tactile paving and dropped kerbs, or raised table,
- The width of the link road is 6m, with local internal roads reduced to 5m, in accordance with Figure 4.55 of DMURS,
- Junction radii for the link street / local street junctions are 4m.

Visibility splays at internal junctions and forward visibility requirements at bends on the local streets are shown in Figure D3. They include visibility splays of 2.4m x 45m in accordance with the 50 km/h speed limit on the link street, and splays of 2.4m x 23m at junctions in the local street network where a 30 km/h speed limit applies. Forward visibility of 23m is shown at bends on the local street network. These splays shall be kept clear of all obstruction over 1.05m in height in accordance with visibility design guidelines.[5]

A swept path analysis was undertaken to test the turning requirements of a refuse vehicle, a large delivery vehicle, a fire tender and a large family car. Figures E1 to E8 included as Appendix E show that the turning movements for each of these vehicles are accommodated in the proposed

[5] DN – GEO – 03060, Geometric Design of Junctions, TII, April 2017

layout. It is noted that larger vehicles are required to cross the centre-line at junctions, which is permissible for infrequent movements, as set out in DMURS.

All dimensions relating to the proposed development access junction off the Ballinderry Road and for the internal pedestrian, cycle and road infrastructure, are included in Drawing No 4 - Site Layout Dimensions, included as part of the submission presented by the Project Architects, Coughlan Associates Architects.

4.3 Parking supply

The rationale for the parking provision within the development site is presented in the Architectural Design Statement prepared Coughlan Associates Architects, and is summarised as follows;

- 63 dwellings have 2 private on-site spaces = 126 spaces
- For the remaining 67 units, 89 parking spaces are provided = 89 spaces
- Total spaces = 215 spaces

It is noted that this is in excess of the requirements set out in Westmeath Development Plan 2021 – 2027 Table 16.2, which requires 1 space per dwelling and 1 visitor space per 3 dwellings, with a total requirement of 173 parking spaces

5 IMPACT OF THE PROPOSED DEVELOPMENT ON THE SURROUNDING NETWORK

5.1 Impact on link flows

The impact that the proposed development is forecast to have on link flows on the surrounding road network during the AM and PM peak hours is shown for both the opening year 2024 and future year 2039 in Table 4. The table shows that the impact of the additional traffic generated by the proposed development with respect to link flows in the opening year 2024 will range from +23.8% (+57 pcus) on the Ballinderry Road in the direction of Mullingar during the PM peak hour, to +37.3% (+60 pcus) on the same road during the AM peak hour.

TII guidelines suggest that a detailed capacity assessment should be undertaken for junctions where the proposed development is forecast to result in an increase in traffic volumes of +10%, or +5% in instances where the network is already congested. A detailed capacity test, as set out in the remainder of this section was therefore undertaken for the development access junction on the L1132 Ballinderry Road.

Table 4 Link flows for without and with proposed development, by time period and year

Junction	Arm	Year 2024				Year 2039			
		No Dev	With dev	Difference	% diff	No Dev	With dev	Difference	% diff
AM peak hour	Ballinderry Road (to Mullingar)	161	221	60	37.3%	185	245	60	32.4%
	Development access	0	117	117	NA	0	117	117	NA
	Ballinderry Road (to N52)	161	218	57	35.4%	185	242	57	30.8%
PM peak hour	Ballinderry Road (to Mullingar)	240	297	57	23.8%	276	333	57	20.7%
	Development access	0	117	117	NA	0	117	117	NA
	Ballinderry Road (to N52)	240	300	60	25.0%	276	336	60	21.7%

5.2 Junction capacity assessment method

The traffic impact of the proposed residential development was assessed at the proposed access junction on the L1132 Ballinderry Road using the industry recognised junction analysis programme PICADY for priority junctions. The programme permits the capacity of any junction to be assessed with respect to existing or forecasts traffic movements for a given time period. The capacity for each movement possible at the junction being assessed is determined from geometric data with the output used in the assessment as follows:

- Ratio of flow to capacity (RFC) – As suggested, this offers a measure of the amount of available capacity being utilised for each movement. Ideally each movement should operate at a level of no greater than 0.85, or at 85% of capacity.
- Queue – This is the average queue forecast for each movement and is useful to ensure that queues will not interfere with adjacent junctions.
- Delay – Output in minutes, this gives an indication of the forecast average delay during the time period modelled for each movement.

5.3 Scenarios modelled

Tests were undertaken for the proposed access junction on the Ballinderry Road for the AM and PM peak hours for traffic conditions in the proposed opening year 2024, and design year 2039. Test were undertaken for the with proposed development scenario, and for a sensitivity tests based on the proposed development x 3 (ie 390 dwellings) in order to test the capacity of the junction to provide for additional development on lands to the west of the subject site. It is considered that this is a reasonable estimate based on an approximate area of total developable land of 14 hectares, which if developed in full, based on a density of 35 dwellings per hectare, would accommodate approximately 500 dwellings. It is noted that as the additional development land would also be accessible from the west, it is considered that this sensitivity test represents a worst case scenario.

5.4 Capacity test results

The results of the capacity tests for the Ballinderry Road access junction are shown for the AM and PM peak hours in Table 5. The results show that by the future year 2039 the maximum ratio of flow to capacity (RFC) will apply to traffic turning right into the proposed development and will reach a maximum of 8.6% during the PM peak hour in the future year 2037. This is forecast to increase to 27.0% with the introduction of the additional development lands located to the west of the subject site.

Queues and delays at the junction are forecast to be minimal with the proposed development in place, with a maximum for the future year 2039 forecast to be 0.13 pcus, and 0.15 minutes (9 seconds) respectfully. For the scenario tested based on 3 times the proposed level of development these are forecast to increase to a maximum queue of 0.46 pcus and delay of 0.19 minutes (12 seconds) in the year 2039.

With up to 85% considered to be within capacity, it is forecast that the proposed access junction on the L1132 Ballinderry Road will operate well within capacity for all scenarios.

The PICADY model printout is included for the worst case with development scenario for the year 2039 PM peak hour is included as Appendix F.

Table 5 Junction capacity test results – Ballinderry Road / development access junction, by time period and year

Year	Movement	Opening year 2024 With development			Future year 2039 With development			Future year 2039 With development x 3		
		RFC (%)	Queue (pcus)	Delay (mins)	RFC (%)	Queue (pcus)	Delay (mins)	RFC (%)	Queue (pcus)	Delay (mins)
AM peak hour	Right out from development	8.0	0.09	0.13	8.1	0.09	0.13	25.2	0.33	0.17
	Left out from development	7.3	0.08	0.10	7.3	0.08	0.10	23.1	0.30	0.13
	Right turn into development	3.6	0.05	0.10	3.6	0.05	0.10	11.1	0.15	0.11
PM peak hour	Right out from development	4.7	0.05	0.15	4.8	0.05	0.15	15.9	0.19	0.19
	Left out from development	4.1	0.04	0.11	4.1	0.04	0.11	12.9	0.15	0.13
	Right turn into development	8.4	0.12	0.11	8.6	0.13	0.11	27.0	0.46	0.14

6 TRAFFIC IMPACTS DURING CONSTRUCTION

6.1 Traffic generation during construction

It is estimated that the construction phase for the 130 dwellings will last for 18 months. During this period it is estimated that the following volume of trips will be generated;

- Site staff – For the first 6 months there will be an average of 60 construction staff on site reducing to 35 per day for the remaining 12 months,
- Deliveries of materials – For the first month approximately 70 deliveries will be made to the site by trucks or HGV's, averaging at 3 to 4 deliveries to / from the site per day. For the next five months approximately 50 deliveries will be made to the site by trucks or HGV's, averaging at 2 to 3 deliveries to / from the site per day. For the remaining 12 months it is estimated that deliveries will average out at 3 per week, or less than one per day.

Staff will be encouraged to travel to the site using sustainable modes of travel, or to car share, and all staff cars will be parked within the proposed development site. All deliveries will be made within the site boundary. All turning manoeuvres undertaken by delivery vehicles will be undertaken within the confines of the development site.

6.2 Outline construction traffic management plan

6.2.1 Introduction

This section sets out a series of construction traffic management measures proposed as part of an Outline Construction Traffic Management Plan (OCTMP) for the development of 130 residential units, located on the west side of the L1132 Ballinderry Road. The requirement for the plan is enhanced due to all construction traffic generated by the proposed development requiring to gain access to the site via the existing L1132 Ballinderry Road, which is directly accessed by existing residential developments and single dwellings.

The OCTMP sets out a series of measures that the Applicant (Consdorf Investment ICAV) will commit to prior to, and during, the construction phase of the project. A detailed CTMP will be prepared by the Contractor appointed by the Applicant to construct the proposed development to be agreed with Westmeath County Council and will include, as a minimum, the commitments set out in this section.

It is intended that this OCTMP complements the additional measures that will be implemented by the Developer and Contractor as part of the Health and Safety plans for the proposed development.

The delivery route for this development is via the existing populated L1132 Ballinderry Road, and it is noted that this environment presents normal challenges that must be addressed and adhered to by all relevant parties, including the Developer, the Contractor and its employees, those delivering and extracting materials to/from the site, and existing residents. While the impact to residents will be kept to a minimum, some temporary measures, including signage and flagmen on the delivery route, are recommended in the interest of safety for existing residents and their visitors.

The proposed measures are set out under the following headings;

- Construction period duration and estimated trip generation,
- Hours of operation and scheduling of deliveries,
- Temporary traffic management measures,
- Instruction to providers,
- Information to residents,
- Tyre cleaning facilities,
- Provision of traffic management coordinator,
- Repairs to route resulting from construction.

6.2.2 Hours of operation and scheduling of deliveries

All staff related traffic movements will take place between the hours of 07:00 and 18:00 Monday to Friday, and 08:00 to 15:00 on Saturday. It is proposed that all deliveries by large vehicles should be undertaken during periods when there is the least pedestrian activity. It is therefore recommended that as far is as possible, deliveries are made to the site between the hours of 10:00 to 15:00 on weekdays only, and that no deliveries are made during the weekends.

The delivery of all materials will be made to / from the site using vehicles the size of a standard sized articulated HGV or smaller (15.4m long by 2.50 wide).

Given the residential nature of this part of the delivery route it is recommended that a member of site staff will operate as a “Flagman” at the site access on the L1132 Ballinderry Road in order to ensure the safety of all concerned. For this reason it is recommended that, wherever possible, deliveries to the site are scheduled to take place during concentrated periods, in order to minimise the time required to man these locations.

6.2.3 Temporary traffic management measures

Temporary traffic measures will be put in place on the delivery route on the L1132 Ballinderry Road in order to ensure that a safe environment is provided for all residents and visitors to the street. The measures will not impact on the general flow of traffic on the road, as they will be limited to warning signs and the presence of a site staff member "flagman" located at the site access at peak delivery times.

While the details of the traffic management measure will be prepared in detail prior to the construction phase by the Contractor and agreed with Westmeath County Council, all measures will be in strict accordance with the ***"Traffic Signs Manual, Section 8 – Temporary Traffic Measures and Signs for Road Works"*** (DoT, now DoTT&S), and **"Guidance for the Control and Management of Traffic at Roadworks"** (DoTT&S, Local Government Service Management Board and NRA, now TII). The Contractor will prepare a detailed site plan, including proposed type and location of temporary signing for agreement with Westmeath County Council. It is envisaged that the plan, at a minimum, will include temporary traffic signs along the route and at the access serving the development site on the L1132 Ballinderry Road, including those shown below.

WK 052		**Site Access on Left:** this sign should be used to indicate the position of a site entrance and/or exit to the left. On roads with a speed limit of >80km/h., an additional sign WK 052 should be positioned 100m in advance of the entrance, with a Supplementary Plate P001 stating the distance. At sites with several entrances, a supplementary colour code or numbering system may be used with this sign.
WK 061		**Flagman Ahead:** this sign should be used to indicate the presence ahead of manual or automated traffic control by means of Stop & Go/Téigh discs. This sign may be used with a Supplementary Plate P 001 stating the distance if forward visibility is poor and on roads with speed limits of >80km/h.
P 080		**Slow:** this plate may be used in conjunction with any roadworks sign to highlight to the road user that speed should be reduced when passing a particular hazard or operation.

6.2.4 Instruction to providers

All companies delivering to the site will be requested to provide all drivers with instruction to strictly adhere to all traffic signs, and to be particularly vigilant for pedestrians, children and other vulnerable users when driving on the L1132 Ballinderry Road.

6.2.5 Information to residents

All residents within the proximity of the proposed development site will be informed of all upcoming traffic related matters (e.g. the duration of the construction phase, temporary traffic management signs etc), via letter drops. Information will include the contact details of the Traffic Management Co-ordinator, who will be the main point of contact for all queries from the public or local authority during normal working hours.

6.2.6 Tyre cleaning facilities and road sweeper

Tyre cleaning facilities will be located on site to ensure all vehicles exiting the site onto the L1132 Ballinderry Road are free from mud and debris. A road sweeper will also be on site to ensure the site access and the Ballinderry Road is kept clear with monitoring undertaken on a daily basis.

6.2.7 Provision of traffic management coordinator

A competent Traffic Management Co-ordinator will be appointed by the Contractor for the duration of the project and this person will be the main point of contact for all matters relating to traffic management.

6.2.8 Repairs to route resulting from construction

During both the construction phase, and once construction is complete, inspections will be made by the Contractor of the L1132 Ballinderry Road in the proximity of the proposed development site, including the carriageway, verges and boundaries. Any locations where damage has occurred due to the construction of the proposed development will be identified to Westmeath County Council and identified for remedial works. All repair work will be undertaken by the Contractor and completed before the Contractor leaves the site.

6.2.9 Covid – 19 guidelines during construction

All staff will adhere to current Covid- 19 Guidelines whilst travelling to the site and when engaging with members of the public.

7 PROVISION FOR SUSTAINABLE MODES OF TRAVEL

7.1 Walking and cycling

As shown in the site layout prepared by the project Architects, included for information in Appendix A, footpaths are provided on both sides of the proposed link road, including raised tables and tactile paving across all minor junctions, and at the main access junction on the L1132 Ballinderry Road, providing continuous pedestrian routes to all dwellings in the proposed development site. Dropped kerbs and tactile paving are proposed at all crossing locations on the minor road network. Continuous pedestrian connections are also provided from the proposed development site to the existing residential area (Chestnut Drive) bordering the site to the north, and the potential development lands to the west.

In order to provide a continuous pedestrian route into Mullingar Town Centre it is proposed to provide a continuous footpath on the west side of the Ballinderry Road, as shown in Drawing No C130 PL2 included in the submission prepared by the Project Engineers, SDS Design Engineers Ltd.

As indicated in Figure 1b and discussed previously, Mullingar Town Centre and much of its amenities (including schools) are within 1.7km and 24 minutes' walk from the proposed site. It is also noted that local shops are located within 1.0km, or 12 minutes' walk, with a crèche located within 0.5 km or 6 minutes' walk.

Access for cyclist travelling to and from the site will be provided via the proposed access junction off the L1132 Ballinderry Road and the internal access road, while cycle lanes are provided on both sides of the link street for those cycling within and through the site. With Mullingar located approximately 2km away, the site is located just 4 minutes cycle (at an average speed of 30 km/h) from the town centre and its amenities.

As set out in the Architectural Design Statement, a total of 79 secured covered bicycle parking bays are provided, based on the following requirements set out in Table 9.1 of the Mullingar Local Area Plan 2014 - 2020;

- 2 spaces for every 100m^2 of residential development, for 3061m^2 = 61 bays
- 1 visitor spaces for every 2 apartments (36 apartments) = 18 bays
- Total = 79 bays

These 79 spaces relate to the duplex/apartments and additional spaces are available on-curtilage for the houses. Additional cycle parking bays can be readily provided and the applicant would welcome a condition in this regard should An Bord Pleanála consider it appropriate.

Based on the above it is considered that walking and cycling are both viable and attractive modes of travel for trips generated by the proposed development, in accordance with the principles set out in DMURS.

7.2 Buses

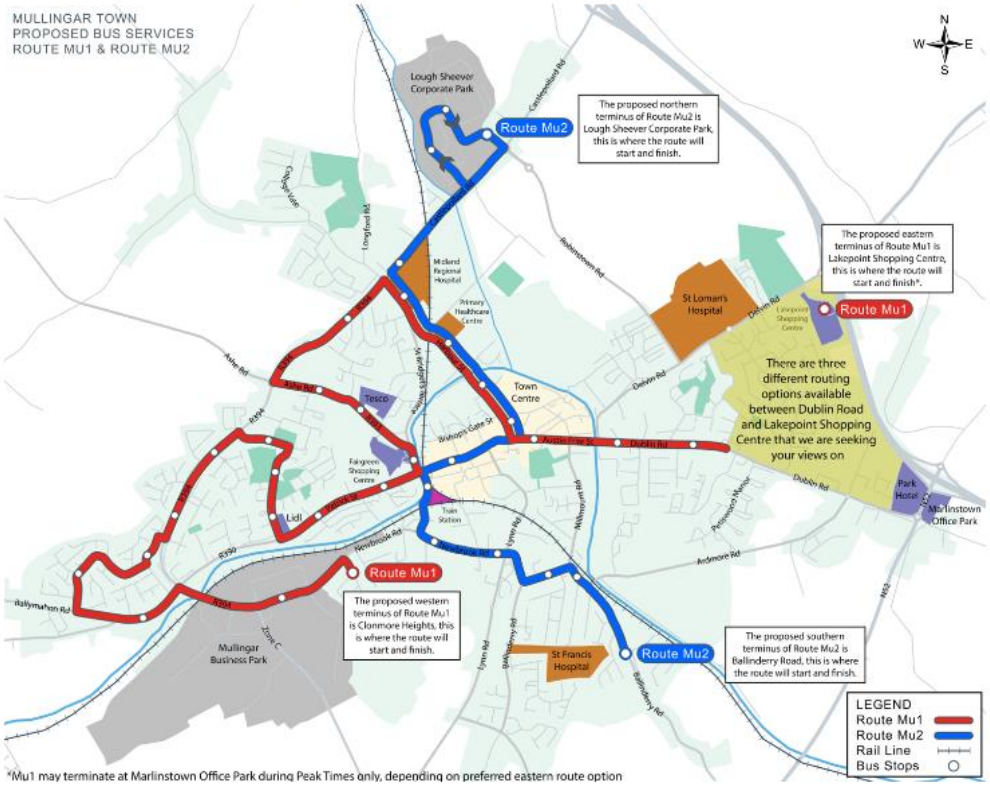
While there are currently limited local bus services within the town of Mullingar at present it is noted that the National Transport Authority and Westmeath County Council are proposing to introduce 2 cross-town bus routes to;

"support the sustainable and compact growth of the town, enable its development potential and provide a public transport option for residents and visitors".

One of the routes included in the public consultation undertaken in January / February 2012 (Blue Route Mu2, see insert overleaf) terminates on the Ballinderry Road adjacent to the proposed development site. The introduction of this service would provide an attractive public transport option for residents and visitors to the proposed development and is fully supported by the Applicant.

In the event that the proposed development is constructed together with the potential development lands located to the west, the proposed link street and the proposed junction with the L1132 Ballinderry Road will provide an ideal opportunity to extend the blue route to the south to serve this new population. It is noted that the proposed development will contribute towards the critical mass that will improve the viability of this bus route.

Proposed Mullingar Town Bus Service - Public Consultation



8 ROAD SAFETY

8.1 Road Safety Audit

A Stage 1 Road Safety Audit has been undertaken for the proposed development. The Audit was undertaken by Bruton Consulting Engineers Ltd and is included as part of this submission. Minor alterations proposed for the internal layout and access junction in response to the Stage 1 Road Safety Audit are shown in Figure D4 of Appendix D.

The issues raised by the Auditors together with the Design Team responses are summarised as follows.

Problem 3.1 – The auditors identify that there is a vertical crest on the L1132 Ballinderry Road situated to the south of the proposed access junction and recommend that the stopping sight distance should be checked in the vertical plane.

The Auditors were provided with Drawing No C102 PL4 prepared by SDS Design Engineers which demonstrates that the required 120m visibility is provided in the vertical plane. This response was accepted by the Auditors in the Feedback form included as the rear of the Audit report.

Problem 3.2 – The Auditors identify that the radii at the junction onto the Ballinderry Road should be 6m to be in accordance with DMURS.

It is confirmed that the junction radii at the junction are now 6m, as was accepted by the Auditors in the Feedback Form.

Problem 3.3 – The Auditors recommend that a pedestrian crossing facility is provided across the Ballinderry Road.

It is confirmed that dropped kerbs and tactile paving is proposed just to the north of the proposed access junction, as shown in Figure D4 of Appendix D, which shows minor changes proposed in response to the Stage 1 Road Safety Audit. This response was accepted by the Auditors in the Feedback Form.

Problem 3.4 – The Auditors identify a number of uncontrolled pedestrian crossings located at the rear of parking spaces and recommended that these should be relocated.

These locations have been identified with minor relocations or realignments proposed as shown in Figure D4 of Appendix D. This was accepted by the Auditors in the Feedback form.

Problem 3.5 - The Auditors recommend that the forward visibility areas shown in the local street network are kept clear of obstruction. This is identified in this TTA and it is confirmed that these areas will be kept clear of any obstruction above 0.9m. This was accepted by the Auditors in the Feedback form.

Problem 3.6 – The Auditors identify that any trees located within visibility splays should be appropriately spaced with suitable stem widths and canopy heights. It was confirmed that these issues have been considered by the landscape architects and that canopy heights of a minimum of 2.0m will apply, in accordance with DMURS. This was accepted by the Auditors in the Feedback form.

It is noted that there is an observation in the Stage 1 Road Safety Audit that there were inconsistences in the location of lighting columns when comparing the landscape and lighting drawings. It is confirmed that these inconsistences are resolved in all drawings presented in the application.

The Road Safety Audit Feedback form was completed by the Design Team and issued to the Audit Team, and is included in the Stage 1 Road Safety Audit report prepared by Bruton Consulting Engineers Ltd and included as part of the planning application submission to An Bord Pleanala.

9 SUMMARY AND CONCLUSIONS

9.1 Summary

An assessment of the traffic impact of a proposed development, comprising 130 dwellings, located on the L1132 Ballinderry Road, Mullingar, County Westmeath was undertaken. The proposed development is located approximately 2 kms south of Mullingar Town Centre.

Based on traffic count surveys undertaken for the proposed development, estimates of future traffic volumes on the surrounding road network were made for the proposed opening year of 2024, and the design year of 2039, based on TII growth rates revised in 2019. The number of trips likely to access the development site during peak hours was determined based on observations made at similar existing developments, with highway capacity tests undertaken at the proposed access junction on the L1132 Ballinderry Road. The junction was established to operate within capacity up to the year 2037 with the proposed development in place.

The proposed internal layout is designed in accordance with principles set out in DMURS, and the National Cycle Manual and is aimed at prioritising access for sustainable modes of transport. This includes the provision of cycle lanes adjacent to the proposed link road that traverses the site.

9.2 Conclusion

It is concluded from this assessment that the proposed residential development will be well served by sustainable modes of travel, and that any additional traffic generated will be adequately accommodated by the proposed access junction on the L1132 Ballinderry Road and the existing local highway network.

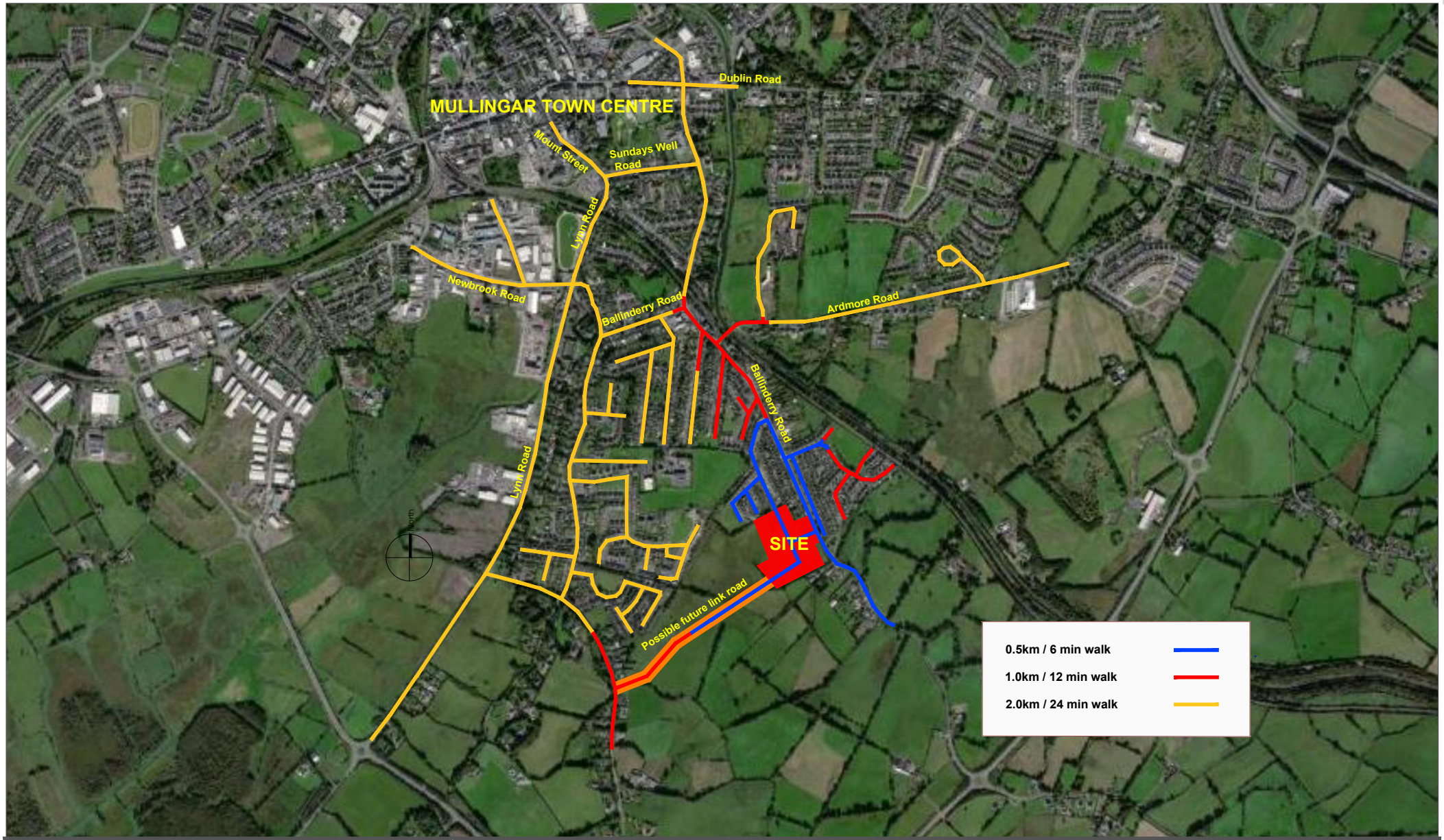
PLATES

Plate 1 Looking north along the L1132 Ballinderry Road, taken from location of proposed site access

Plate 2 Looking south along the L1132 Ballinderry Road, taken from location of proposed site access

Plate 3 Looking south along the L1132 Ballinderry Road, taken from south of proposed site

FIGURES



NOTES:

PLANNING DRAWING ONLY - NOT FOR CONSTRUCTION PURPOSES

Figure 1b Walk distances and times from site

PROJECT:	Proposed housing development at Ballinderry Road, Mullingar, County Westmeath		
CLIENT:	Consdorf Investments ICAV		SCALE: NTS
PROJECT NO: 8060	DATE: 10.03.22		DRAWN BY: AL

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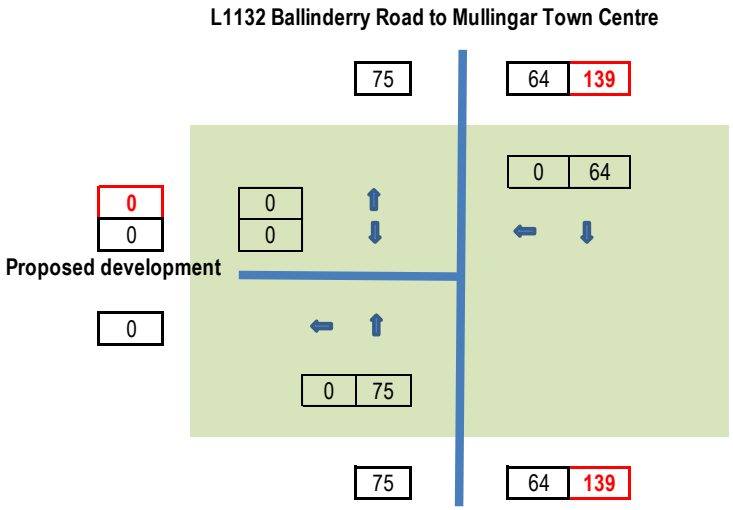
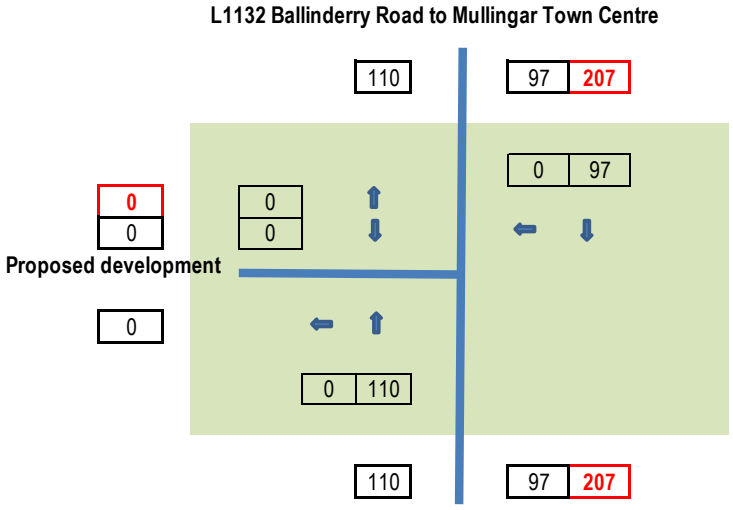


Observed traffic flows
June 2019
AM peak hour (08:00 to 09:00)

All flows in pcus



Observed traffic flows
June 2019
PM peak hour (17:00 to 18:00)

All flows in pcus

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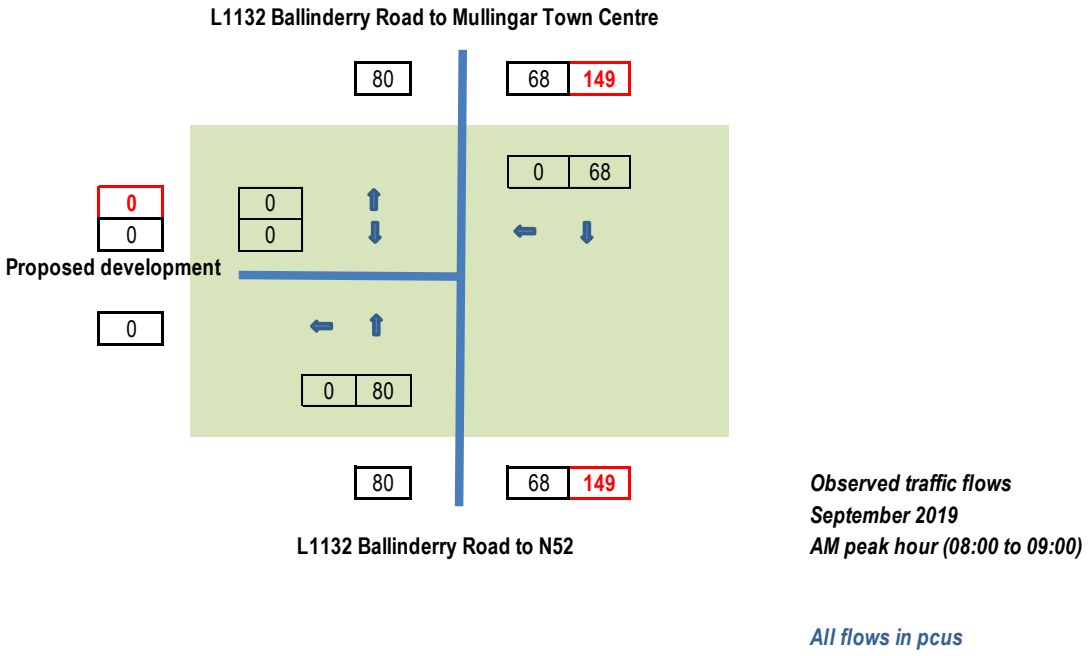
Figure 2 Observed traffic flows, AM and PM peak hours, June 2019, no development



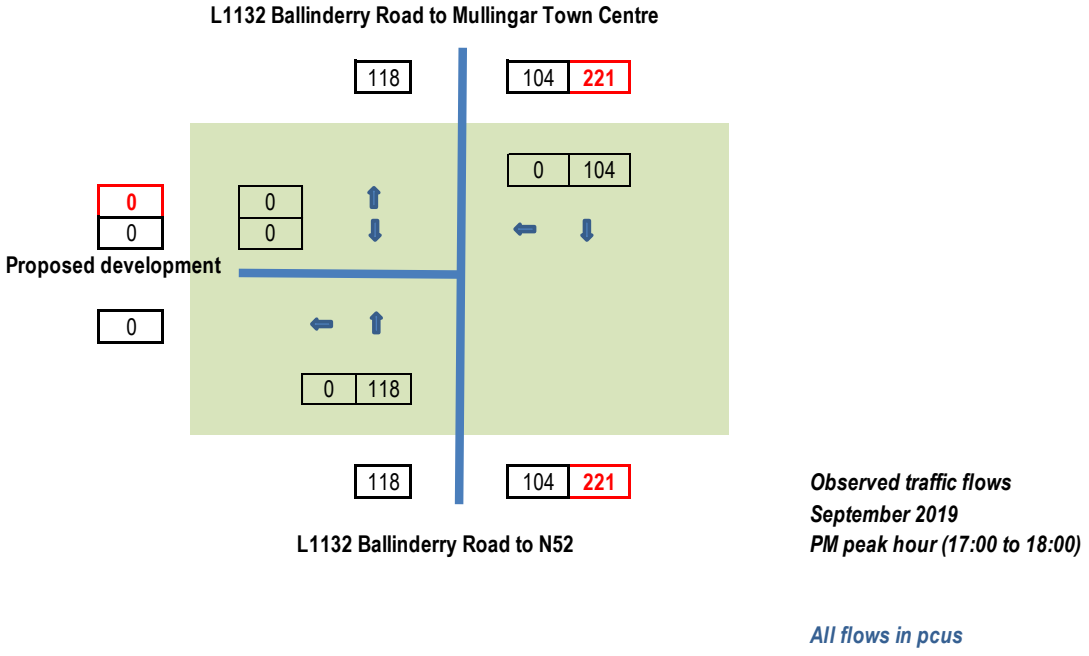


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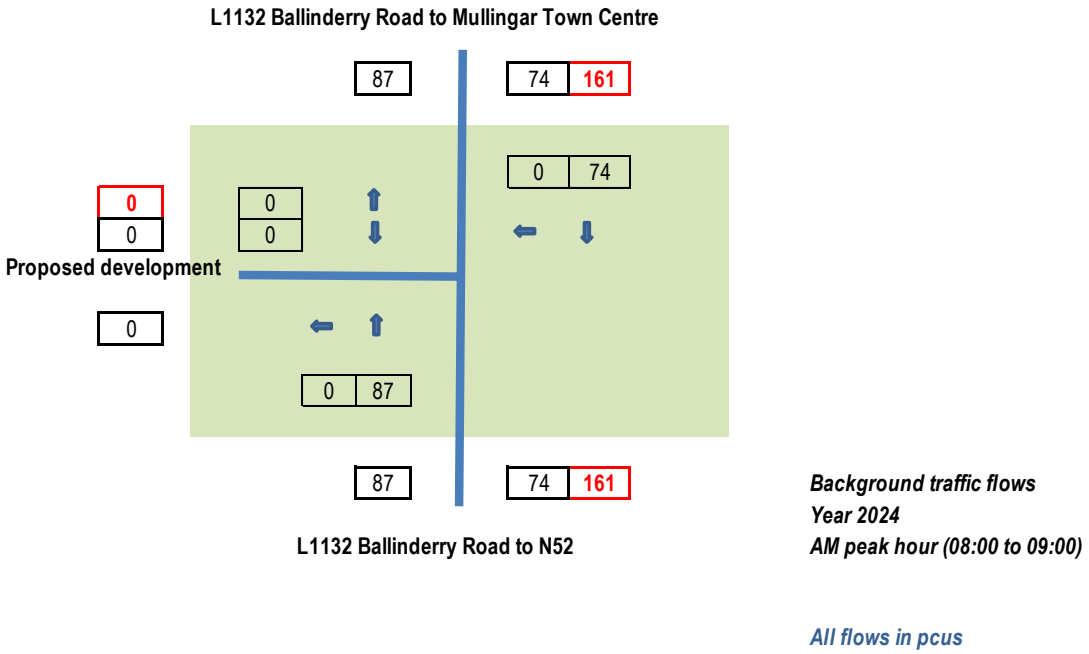
Figure 3 Seaasonally adjusted traffic flows, AM and PM peak hours, September 2019, no development



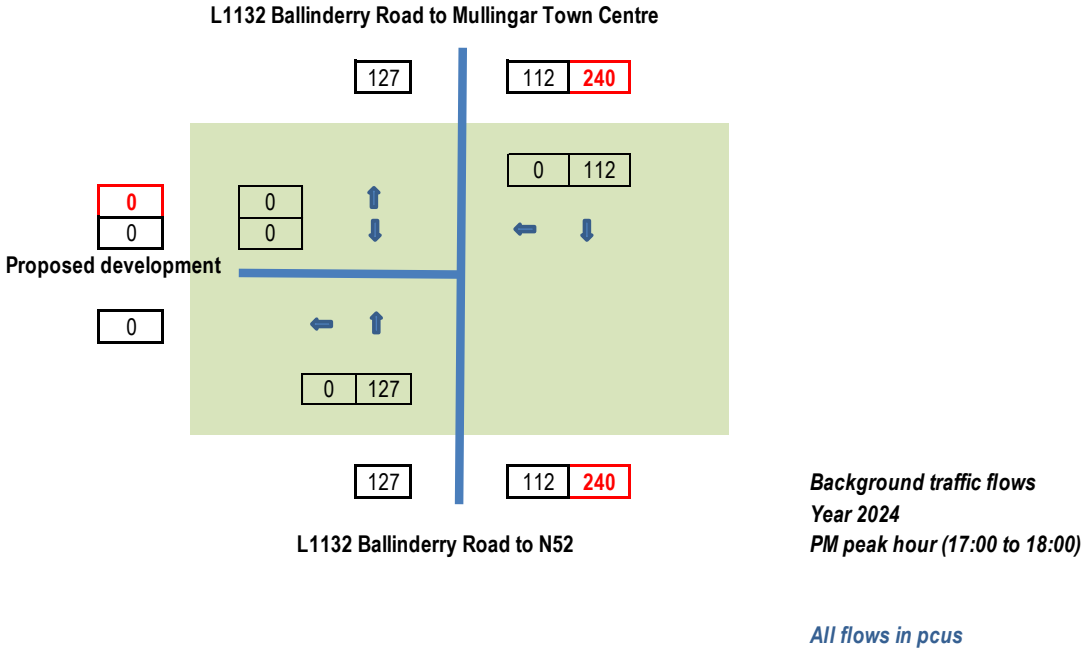


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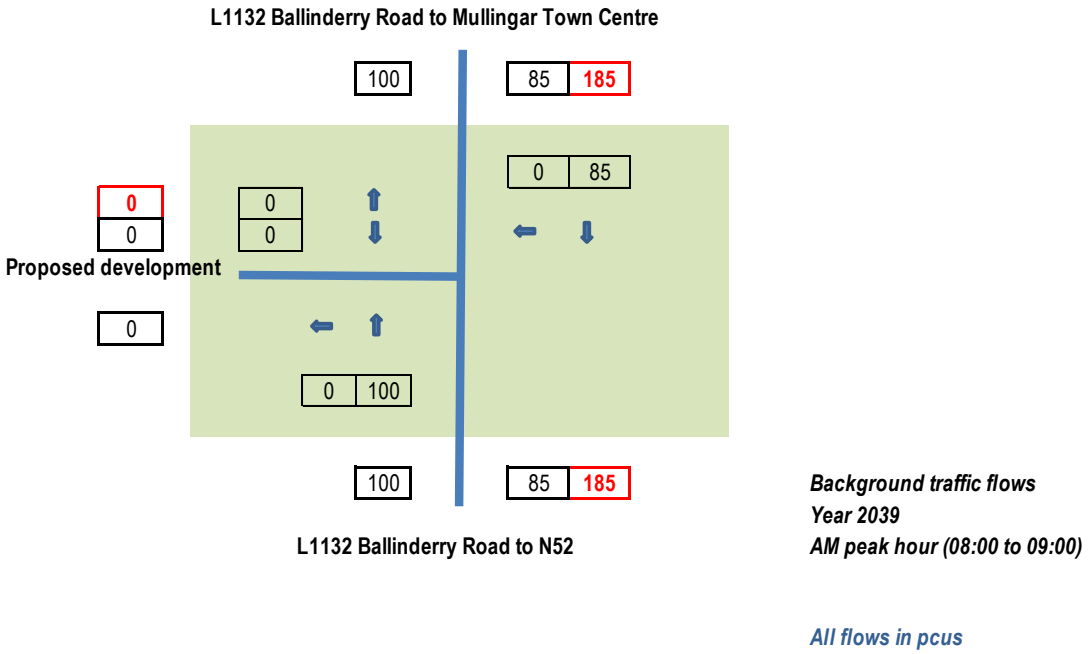
Figure 4 Opening year background traffic flows, AM and PM peak hou
Year 2024, no development



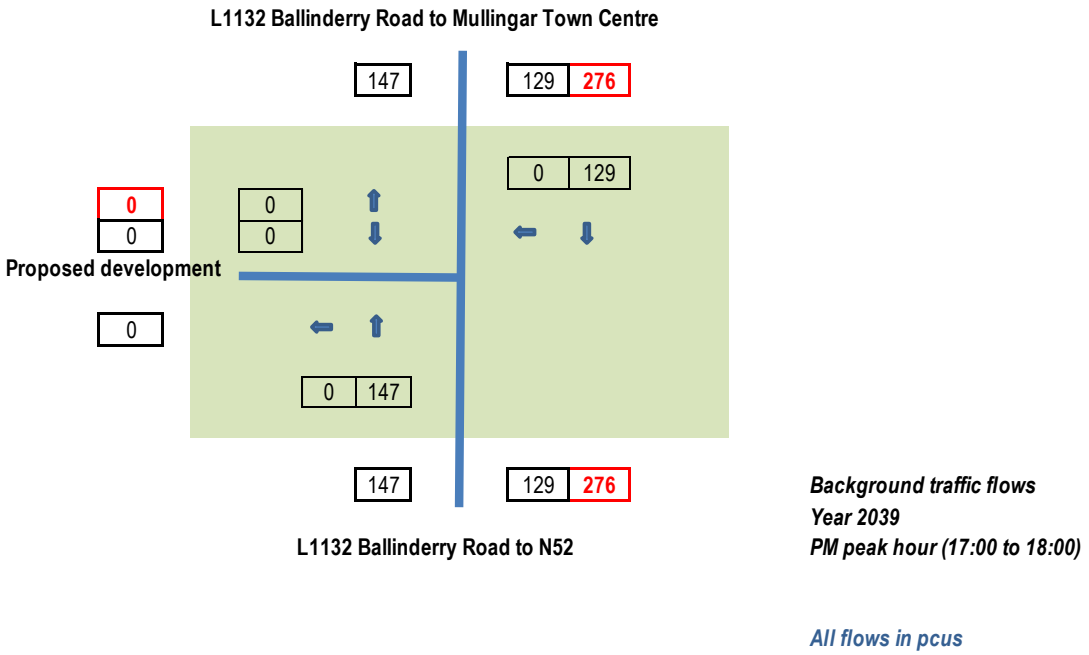


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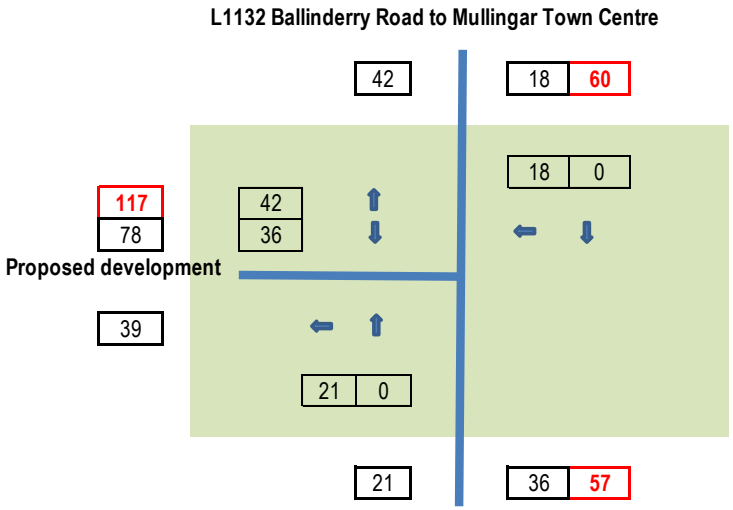
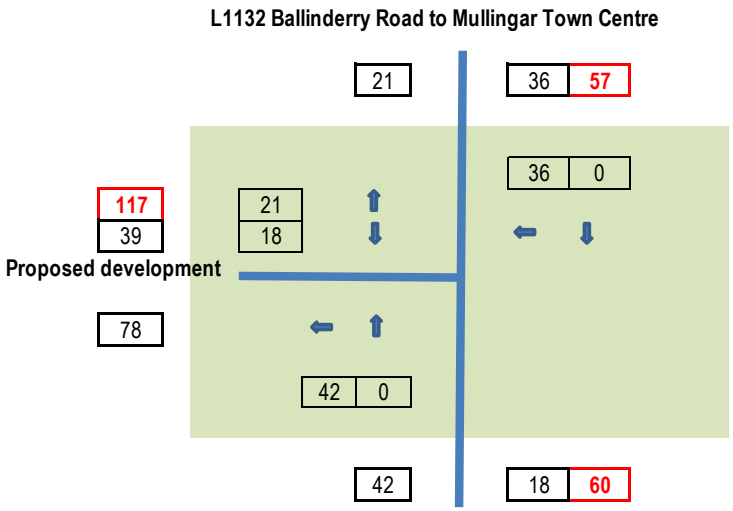
Figure 5 Future year background traffic flows, AM and PM peak hours, Year 2039, no development



Development traffic trip patterns

AM peak hour (08:00 to 09:00)

All flows in pcus

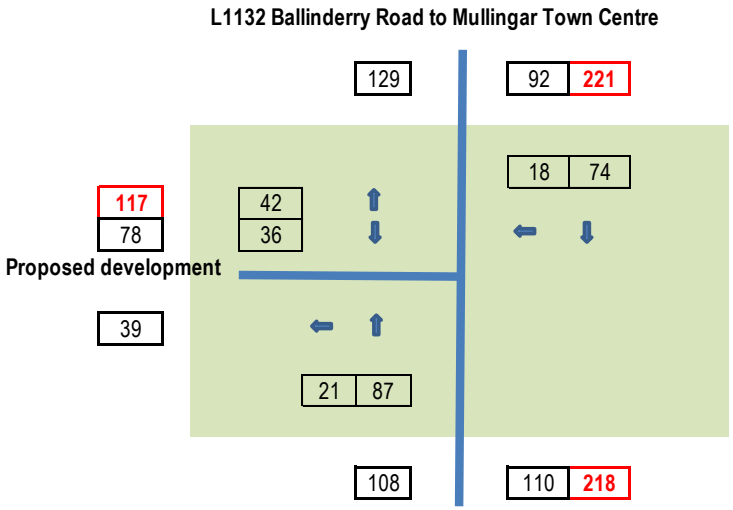


Development traffic trip patterns

PM peak hour (17:00 to 18:00)

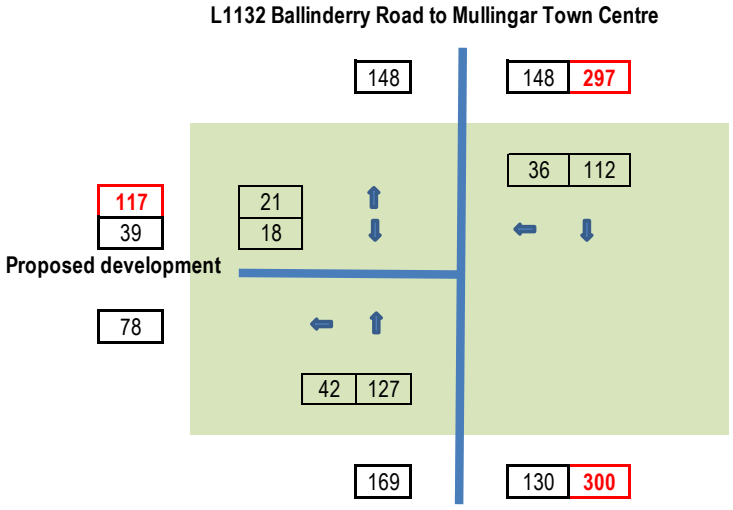
All flows in pcus

Figure 6 Development generated traffic, AM and PM peak hours



With development traffic flows
Year 2024
AM peak hour (08:00 to 09:00)

All flows in pcus



With development traffic flows
Year 2024
PM peak hour (17:00 to 18:00)

All flows in pcus

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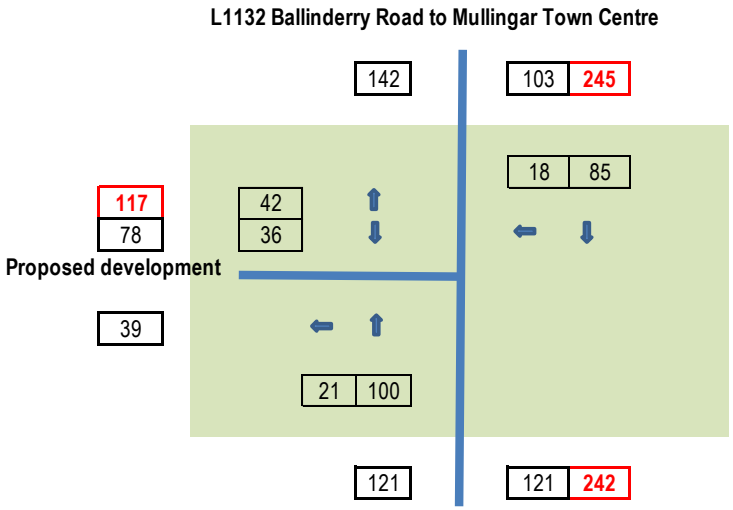
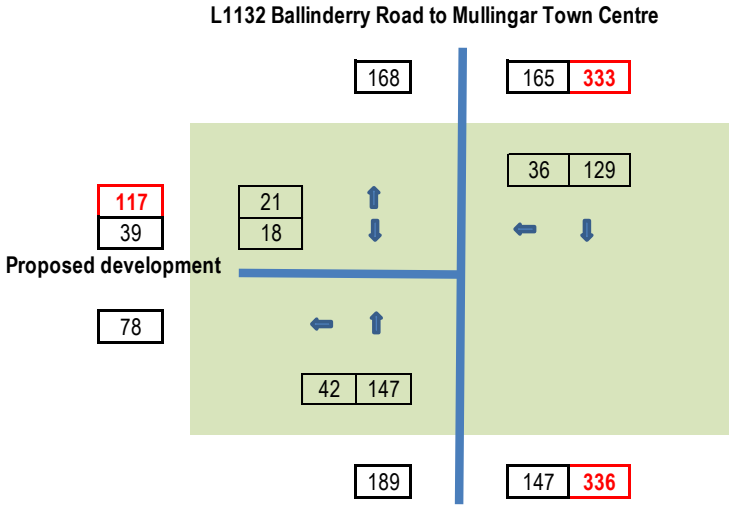
Figure 7 Opening year traffic flows, AM and PM peak hours, Year 2024, with development



With development traffic flows
Year 2039
AM peak hour (08:00 to 09:00)

All flows in pcus



With development traffic flows
Year 2039
PM peak hour (17:00 to 18:00)

All flows in pcus

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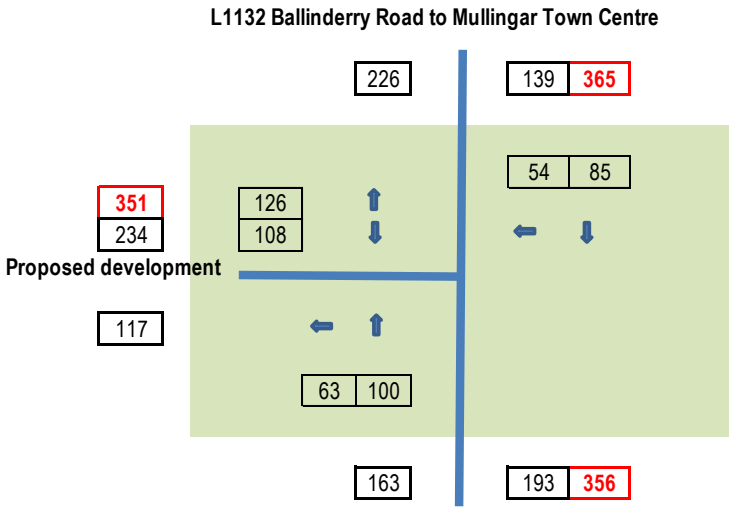
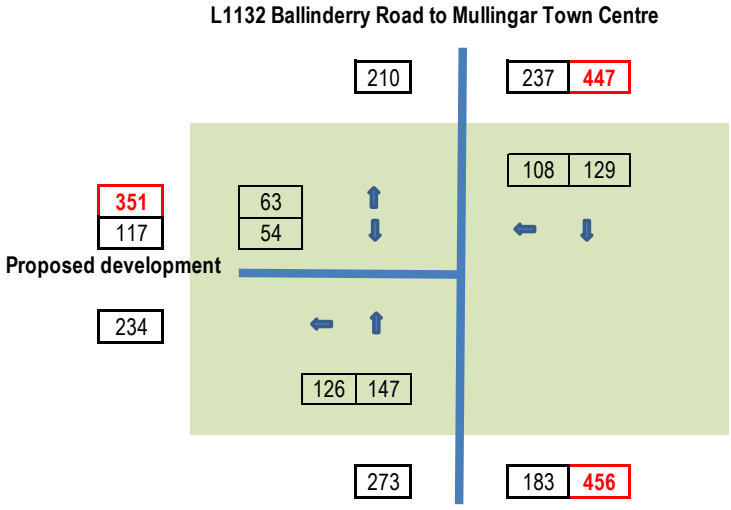
TRAFFIC & TRANSPORT CONSULTANTS

Figure 8 Future year traffic flows, AM and PM peak hours, Year 2039, with development



With development traffic flows
Year 2039
AM peak hour (08:00 to 09:00)

All flows in pcus



With development traffic flows
Year 2039
PM peak hour (17:00 to 18:00)

All flows in pcus

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TRAFFIC & TRANSPORT CONSULTANTS

Figure 9 Future year traffic flows, AM and PM peak hours, Year 2039, with development x 3 sensitivity

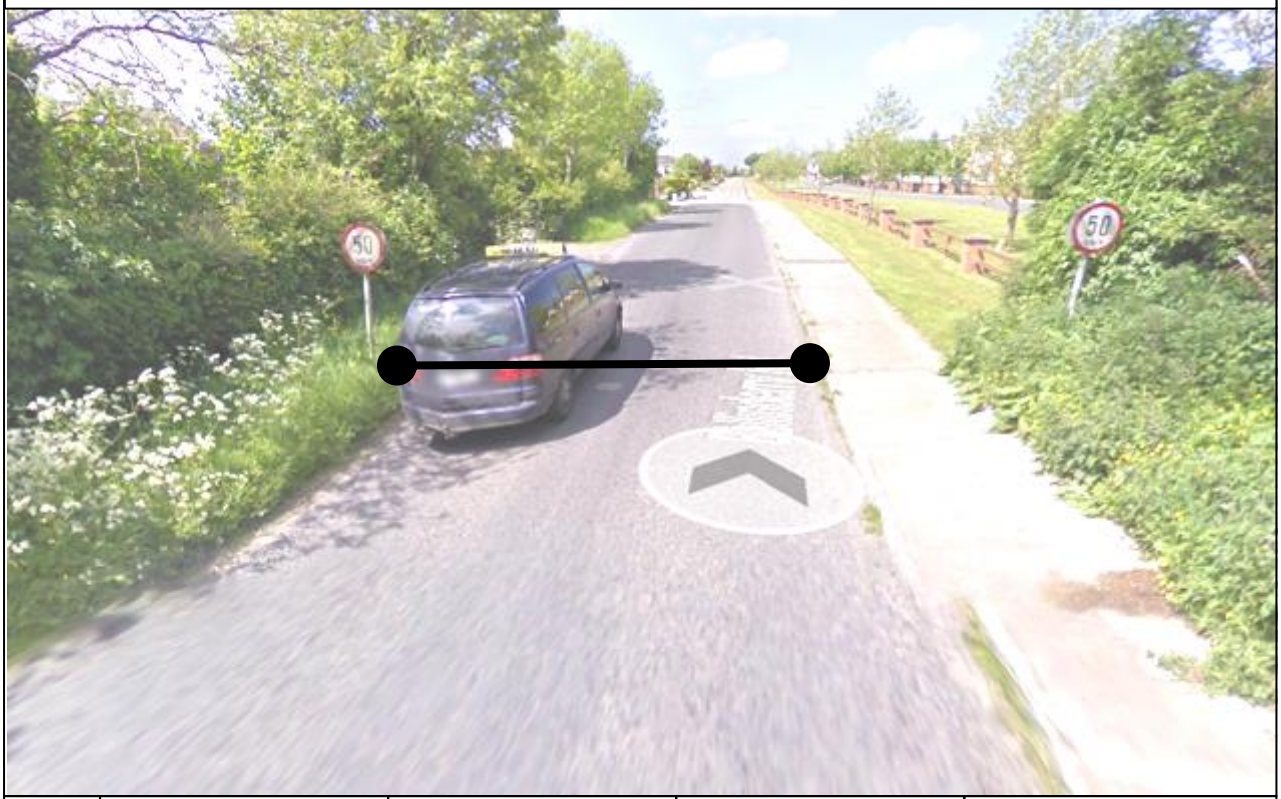
Appendix A Proposed Site Layout (Coughlan Associates Architects and Doyle + O'Troithigh Landscape Architects)

LP-03-PP
LP-04-PP
LP-02-PP
LP-05-PP
LP-06-PP
Open Space D
Open Space A
Open Space C
Open Space B
Open Space E
Pumpstation
BALLINDERRY ROAD
A
B
C
D
E
F
G
H
Legend
Note:
See Architects drawings for all boundary details.
Refer to supporting arboricultural drawing and reports package with regard to tree retention/removal
Please refer to PG-03-PP to PG-03-PP inclusive for play and exercise equipment
Refer to the section details drawings for further reference
Ballinderry Road, Mullingar
18-069
Overall Landscape Plan
LP-01-PP
1:500
kgl
ld
Planning
16.03.2022
doyle + o'troithigh
landscape - architecture

Appendix B Observed Traffic Count Survey Data, L1132 Ballinderry Road (Wednesday 12th June, 2019)

Site Location

Site Location



	Job number: TRA/19/145	Job Date: Week Commencing Wednesday 12th June 2019	Drawing No: TRA/19/145-01	traffinomics.ie
	Client: Alan Lipscombe		Author: SPW	

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MULLIGAR TRAFFIC COUNT/SPEED SURVEY **SUMMARY** **WEEK COMMENCING: Wednesday 12 June 2019**

AUTOMATIC TRAFFIC COUNT **TRA/19/145**

SITE 01

LOCATION: L1132 Ballinderry Road (Google Maps Ref: 53.512278, -7.327546)

SPEED SURVEY SUMMARY:

NORTHBOUND	85% Speed = 69.66 km/h, 95% Speed = 76.05 km/h, Median = 59.58 km/h	Maximum = 112.1 km/h, Minimum = 5.1 km/h, Mean = 59.0 km/h
SOUTHBOUND	85% Speed = 71.28 km/h, 95% Speed = 78.21 km/h, Median = 60.39 km/h	Maximum = 113.7 km/h, Minimum = 7.1 km/h, Mean = 60.2 km/h

VOLUMETRIC VEHICLE COUNTS:

Direction	Time	Wednesday 12 June 2019	Thursday 13 June 2019	Friday 14 June 2019	Saturday 15 June 2019	Sunday 16 June 2019	Monday 17 June 2019	Tuesday 18 June 2019	No. Vehicles	7 day Mean
NORTHBOUND	**07-19**	679	709	732	640	455	607	667	4489	641
SOUTHBOUND	**07-19**	650	695	720	655	506	623	692	4541	649
NORTHBOUND	**00-00**	856	850	901	818	627	750	817	5619	803
SOUTHBOUND	**00-00**	846	852	913	811	665	774	841	5702	815

PEAK FLOW SUMMARY:

Peak	AM	IP	PM
Most Frequent Peak Hour	0900	1300	1700
Average Vehicles per Peak Hour	62	64	82

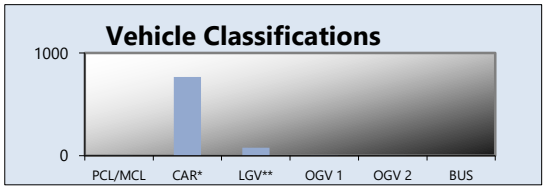
TRAFFINOMICS LIMITED

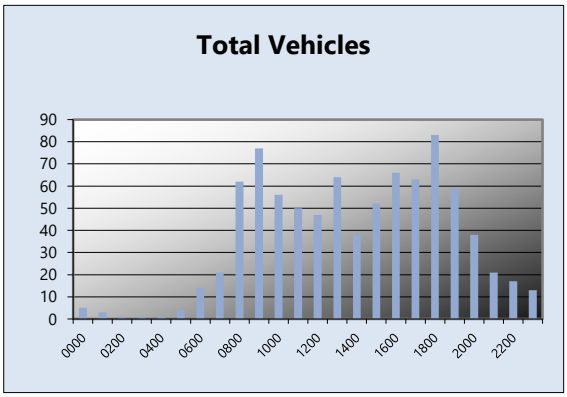
MULLIGAR TRAFFIC COUNT/SPEED SURVEY **Wednesday 12 June 2019**
AUTOMATIC TRAFFIC COUNT **TRA/19/145**

SITE 01
NORTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	5	0	0	0	0	5	5
0100	0	3	0	0	0	0	3	3
0200	0	1	0	0	0	0	1	1
0300	0	1	0	0	0	0	1	1
0400	0	1	0	0	0	0	1	1
0500	0	2	2	0	0	0	4	4
0600	0	11	3	0	0	0	14	14
0700	0	19	2	0	0	0	21	21
0800	0	55	5	1	1	0	62	64
0900	0	69	8	0	0	0	77	77
1000	0	53	3	0	0	0	56	56
1100	0	45	5	0	0	0	50	50
1200	0	43	4	0	0	0	47	47
1300	0	59	3	2	0	0	64	65
1400	0	32	6	0	0	0	38	38
1500	0	45	5	2	0	0	52	53
1600	0	60	5	1	0	0	66	67
1700	0	52	9	1	1	0	63	65
1800	2	73	7	0	1	0	83	83
1900	0	56	3	0	0	0	59	59
2000	0	33	5	0	0	0	38	38
2100	0	21	0	0	0	0	21	21
2200	0	17	0	0	0	0	17	17
2300	0	11	2	0	0	0	13	13
07-19	2	605	62	7	3	0	679	685
06-22	2	726	73	7	3	0	811	817
06-00	2	754	75	7	3	0	841	847
00-00	2	767	77	7	3	0	856	862

Peaks	Time	Vehicles	PCU's
AM	0900	77	77
IP	1300	64	65
PM	1800	83	82.7





Traffinomics Limited for
Alan Lipscombe Traffic

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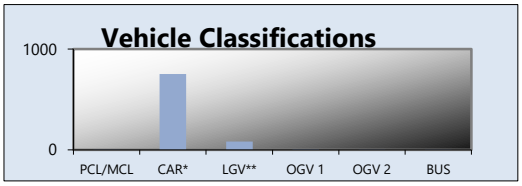
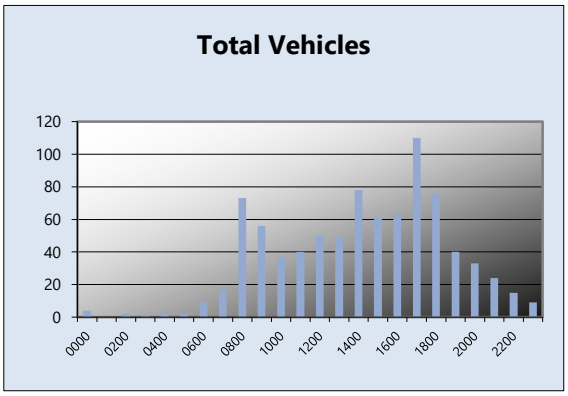
MULLIGAR TRAFFIC COUNT/SPEED SURVEY **Thursday 13 June 2019**
AUTOMATIC TRAFFIC COUNT **TRA/19/145**

SITE 01
NORTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	4	0	0	0	0	4	4
0100	0	0	0	0	0	0	0	0
0200	0	2	0	0	0	0	2	2
0300	0	0	1	0	0	0	1	1
0400	0	1	0	0	1	0	2	3
0500	0	1	1	0	0	0	2	2
0600	0	5	4	0	0	0	9	9
0700	0	15	2	0	0	0	17	17
0800	0	63	8	1	1	0	73	75
0900	0	47	9	0	0	0	56	56
1000	0	30	6	1	0	0	37	38
1100	0	36	4	0	0	0	40	40
1200	0	46	3	1	0	0	50	51
1300	0	44	5	0	0	0	49	49
1400	1	73	3	1	0	0	78	78
1500	0	56	4	1	0	0	61	62
1600	0	56	5	0	0	1	62	63
1700	1	98	10	1	0	0	110	110
1800	0	72	4	0	0	0	76	76
1900	0	34	6	0	0	0	40	40
2000	0	30	2	0	1	0	33	34
2100	0	21	3	0	0	0	24	24
2200	0	11	2	2	0	0	15	16
2300	0	9	0	0	0	0	9	9
07-19	2	636	63	6	1	1	709	713
06-22	2	726	78	6	2	1	815	820
06-00	2	746	80	8	2	1	839	845
00-00	2	754	82	8	3	1	850	857

Peaks	Time	Vehicles	PCU's
AM	0800	73	74.8
IP	1400	78	77.7
PM	1700	110	109.7





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Alan Lipscombe Traffic

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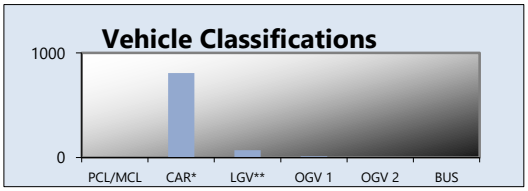
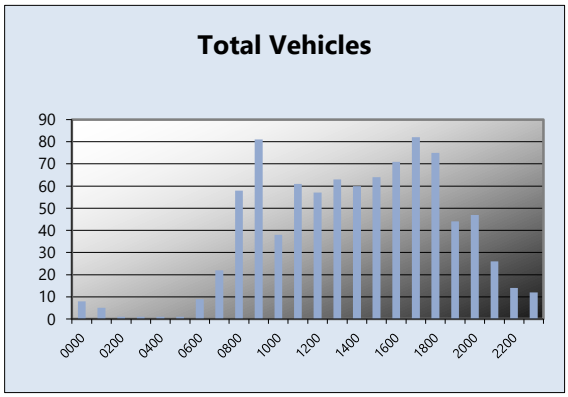
MULLIGAR TRAFFIC COUNT/SPEED SURVEY **Friday 14 June 2019**
AUTOMATIC TRAFFIC COUNT **TRA/19/145**

SITE 01
NORTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	7	1	0	0	0	8	8
0100	0	5	0	0	0	0	5	5
0200	0	1	0	0	0	0	1	1
0300	0	1	0	0	0	0	1	1
0400	0	1	0	0	0	0	1	1
0500	0	1	0	0	0	0	1	1
0600	0	7	2	0	0	0	9	9
0700	0	15	7	0	0	0	22	22
0800	1	57	0	0	0	0	58	57
0900	0	71	9	0	1	0	81	82
1000	0	35	1	2	0	0	38	39
1100	0	51	6	3	1	0	61	64
1200	0	49	8	0	0	0	57	57
1300	0	60	1	2	0	0	63	64
1400	0	49	9	1	0	1	60	62
1500	0	57	4	2	1	0	64	66
1600	1	66	2	1	1	0	71	72
1700	1	71	9	1	0	0	82	82
1800	0	70	5	0	0	0	75	75
1900	1	39	4	0	0	0	44	43
2000	0	45	2	0	0	0	47	47
2100	0	26	0	0	0	0	26	26
2200	0	14	0	0	0	0	14	14
2300	0	11	1	0	0	0	12	12
07-19	3	651	61	12	4	1	732	742
06-22	4	768	69	12	4	1	858	867
06-00	4	793	70	12	4	1	884	893
00-00	4	809	71	12	4	1	901	910

Peaks	Time	Vehicles	PCU's
AM	0900	81	82.3
IP	1300	63	64
PM	1700	82	81.7





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Alan Lipscombe Traffic

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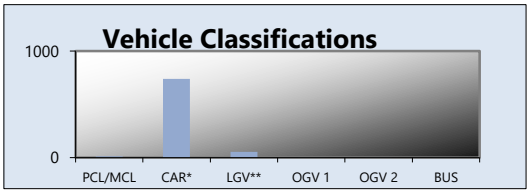
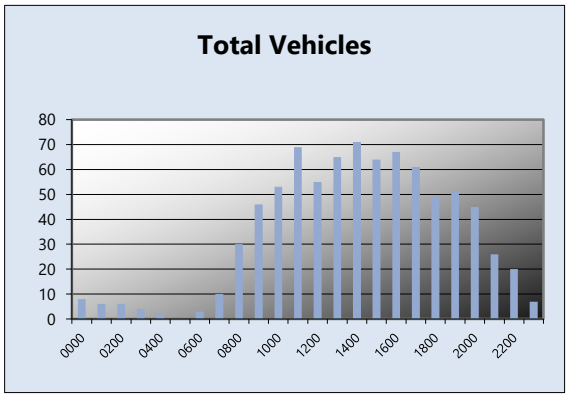
MULLIGAR TRAFFIC COUNT/SPEED SURVEY **Saturday 15 June 2019**
AUTOMATIC TRAFFIC COUNT **TRA/19/145**

SITE 01
NORTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	8	0	0	0	0	8	8
0100	0	5	1	0	0	0	6	6
0200	0	6	0	0	0	0	6	6
0300	0	4	0	0	0	0	4	4
0400	0	2	0	0	0	0	2	2
0500	0	0	0	0	0	0	0	0
0600	0	2	1	0	0	0	3	3
0700	0	7	3	0	0	0	10	10
0800	0	26	4	0	0	0	30	30
0900	0	41	5	0	0	0	46	46
1000	4	47	2	0	0	0	53	50
1100	1	64	1	1	1	1	69	71
1200	2	46	6	0	0	1	55	54
1300	0	58	6	0	1	0	65	66
1400	0	69	2	0	0	0	71	71
1500	2	57	3	0	1	1	64	65
1600	0	61	4	1	1	0	67	69
1700	2	55	4	0	0	0	61	59
1800	0	47	1	1	0	0	49	50
1900	0	45	5	1	0	0	51	52
2000	0	40	5	0	0	0	45	45
2100	0	25	1	0	0	0	26	26
2200	0	18	2	0	0	0	20	20
2300	0	7	0	0	0	0	7	7
07-19	11	578	41	3	4	3	640	641
06-22	11	690	53	4	4	3	765	766
06-00	11	715	55	4	4	3	792	793
00-00	11	740	56	4	4	3	818	819

Peaks	Time	Vehicles	PCU's
AM	0900	46	46
IP	1400	71	71
PM	1600	67	68.8





Traffinomics Limited for
Alan Lipscombe Traffic

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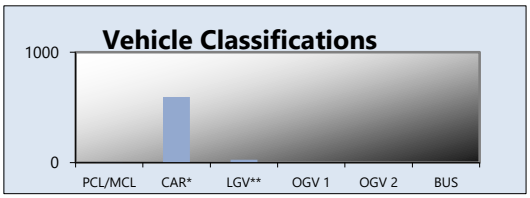
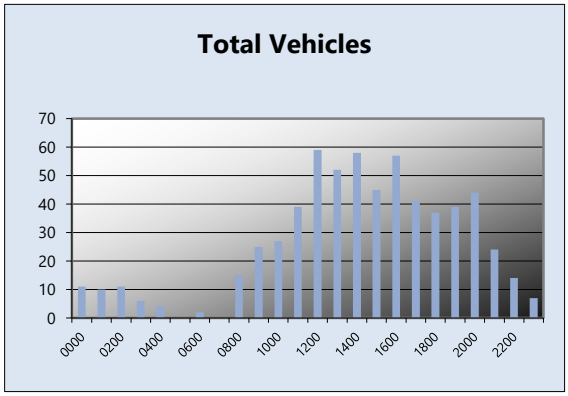
MULLIGAR TRAFFIC COUNT/SPEED SURVEY **Sunday 16 June 2019**
AUTOMATIC TRAFFIC COUNT **TRA/19/145**

SITE 01
NORTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	11	0	0	0	0	11	11
0100	0	9	1	0	0	0	10	10
0200	0	10	1	0	0	0	11	11
0300	0	6	0	0	0	0	6	6
0400	0	4	0	0	0	0	4	4
0500	0	0	0	0	0	0	0	0
0600	0	2	0	0	0	0	2	2
0700	0	0	0	0	0	0	0	0
0800	0	14	1	0	0	0	15	15
0900	1	20	4	0	0	0	25	24
1000	1	24	2	0	0	0	27	26
1100	0	39	0	0	0	0	39	39
1200	0	56	3	0	0	0	59	59
1300	0	50	2	0	0	0	52	52
1400	3	51	4	0	0	0	58	56
1500	0	43	2	0	0	0	45	45
1600	1	55	1	0	0	0	57	56
1700	0	40	1	0	0	0	41	41
1800	0	35	2	0	0	0	37	37
1900	0	39	0	0	0	0	39	39
2000	0	42	2	0	0	0	44	44
2100	0	24	0	0	0	0	24	24
2200	0	14	0	0	0	0	14	14
2300	0	6	1	0	0	0	7	7
07-19	6	427	22	0	0	0	455	450
06-22	6	534	24	0	0	0	564	559
06-00	6	554	25	0	0	0	585	580
00-00	6	594	27	0	0	0	627	622

Peaks	Time	Vehicles	PCU's
AM	0900	25	24.2
IP	1200	59	59
PM	1600	57	56.2





Traffinomics Limited for
Alan Lipscombe Traffic

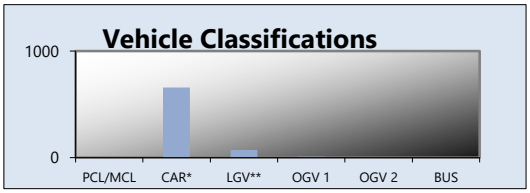
TRAFFINOMICS LIMITED

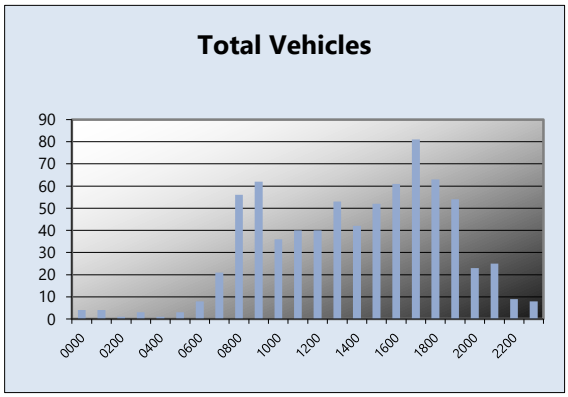
MULLIGAR TRAFFIC COUNT/SPEED SURVEY **Monday 17 June 2019**
AUTOMATIC TRAFFIC COUNT **TRA/19/145**

SITE 01
NORTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	2	2	0	0	0	4	4
0100	0	3	1	0	0	0	4	4
0200	0	1	0	0	0	0	1	1
0300	0	3	0	0	0	0	3	3
0400	0	1	0	0	0	0	1	1
0500	0	2	1	0	0	0	3	3
0600	0	6	2	0	0	0	8	8
0700	0	20	1	0	0	0	21	21
0800	0	52	3	1	0	0	56	57
0900	0	50	8	3	0	1	62	65
1000	0	33	3	0	0	0	36	36
1100	0	33	4	1	1	1	40	43
1200	0	38	2	0	0	0	40	40
1300	1	43	8	0	1	0	53	54
1400	0	38	4	0	0	0	42	42
1500	0	49	0	2	0	1	52	54
1600	0	52	6	3	0	0	61	63
1700	0	74	6	0	1	0	81	82
1800	0	55	7	0	1	0	63	64
1900	0	50	4	0	0	0	54	54
2000	0	17	6	0	0	0	23	23
2100	0	23	2	0	0	0	25	25
2200	1	8	0	0	0	0	9	8
2300	0	6	2	0	0	0	8	8
07-19	1	537	52	10	4	3	607	619
06-22	1	633	66	10	4	3	717	729
06-00	2	647	68	10	4	3	734	746
00-00	2	659	72	10	4	3	750	762

Peaks	Time	Vehicles	PCU's
AM	0900	62	64.5
IP	1300	53	53.5
PM	1700	81	82.3





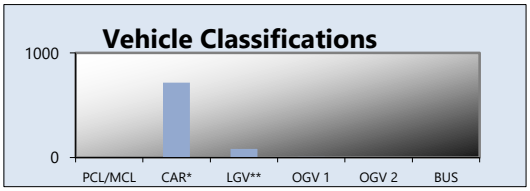
TRAFFINOMICS LIMITED

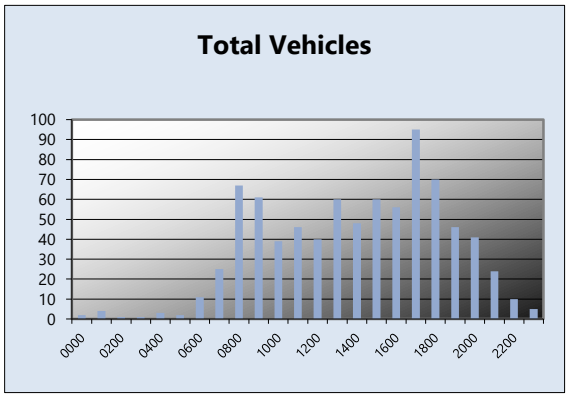
MULLIGAR TRAFFIC COUNT/SPEED SURVEY **Tuesday 18 June 2019**
AUTOMATIC TRAFFIC COUNT **TRA/19/145**

SITE 01
NORTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	2	0	0	0	0	2	2
0100	0	4	0	0	0	0	4	4
0200	0	1	0	0	0	0	1	1
0300	0	1	0	0	0	0	1	1
0400	0	2	0	0	1	0	3	4
0500	0	1	1	0	0	0	2	2
0600	0	7	4	0	0	0	11	11
0700	0	21	4	0	0	0	25	25
0800	0	61	6	0	0	0	67	67
0900	1	55	5	0	0	0	61	60
1000	0	36	3	0	0	0	39	39
1100	0	40	6	0	0	0	46	46
1200	0	37	3	0	0	0	40	40
1300	1	50	9	0	0	0	60	59
1400	0	42	6	0	0	0	48	48
1500	0	50	5	2	1	2	60	64
1600	0	51	4	1	0	0	56	57
1700	0	84	9	2	0	0	95	96
1800	0	63	5	1	1	0	70	72
1900	0	40	6	0	0	0	46	46
2000	3	33	5	0	0	0	41	39
2100	0	22	2	0	0	0	24	24
2200	0	10	0	0	0	0	10	10
2300	0	5	0	0	0	0	5	5
07-19	2	590	65	6	2	2	667	673
06-22	5	692	82	6	2	2	789	793
06-00	5	707	82	6	2	2	804	808
00-00	5	718	83	6	3	2	817	822

Peaks	Time	Vehicles	PCU's
AM	0800	67	67
IP	1300	60	59.2
PM	1700	95	96





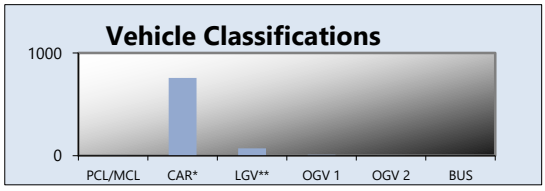
TRAFFINOMICS LIMITED

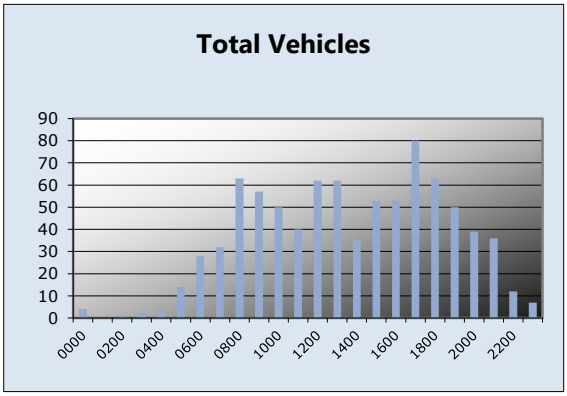
MULLIGAR TRAFFIC COUNT/SPEED SURVEY **Wednesday 12 June 2019**
AUTOMATIC TRAFFIC COUNT **TRA/19/145**

SITE 01
SOUTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	4	0	0	0	0	4	4
0100	0	0	0	0	0	0	0	0
0200	0	1	0	0	0	0	1	1
0300	0	2	0	0	0	0	2	2
0400	0	3	0	0	0	0	3	3
0500	0	11	3	0	0	0	14	14
0600	0	23	5	0	0	0	28	28
0700	0	30	2	0	0	0	32	32
0800	0	57	4	2	0	0	63	64
0900	0	51	4	1	0	1	57	59
1000	0	44	6	0	0	0	50	50
1100	1	37	2	0	0	0	40	39
1200	0	56	5	1	0	0	62	63
1300	1	55	6	0	0	0	62	61
1400	0	30	3	2	0	0	35	36
1500	0	48	4	1	0	0	53	54
1600	0	48	4	0	1	0	53	54
1700	0	70	9	1	0	0	80	81
1800	1	58	4	0	0	0	63	62
1900	0	48	2	0	0	0	50	50
2000	0	34	4	1	0	0	39	40
2100	2	30	4	0	0	0	36	34
2200	0	12	0	0	0	0	12	12
2300	0	7	0	0	0	0	7	7
07-19	3	584	53	8	1	1	650	654
06-22	5	719	68	9	1	1	803	806
06-00	5	738	68	9	1	1	822	825
00-00	5	759	71	9	1	1	846	849

Peaks	Time	Vehicles	PCU's
AM	0800	63	64
IP	1200	62	62.5
PM	1700	80	80.5





Traffinomics Limited for
Alan Lipscombe Traffic

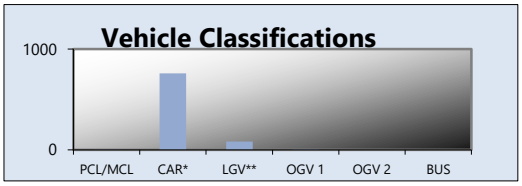
TRAFFINOMICS LIMITED

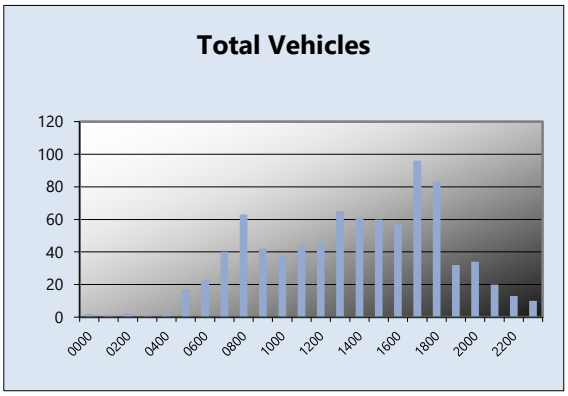
MULLIGAR TRAFFIC COUNT/SPEED SURVEY **Thursday 13 June 2019**
AUTOMATIC TRAFFIC COUNT **TRA/19/145**

SITE 01
SOUTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	2	0	0	0	0	2	2
0100	0	1	0	0	0	0	1	1
0200	0	1	1	0	0	0	2	2
0300	0	1	0	0	0	0	1	1
0400	0	1	1	0	0	0	2	2
0500	0	13	4	0	0	0	17	17
0600	0	21	2	0	0	0	23	23
0700	0	35	5	0	0	0	40	40
0800	0	55	6	2	0	0	63	64
0900	0	38	4	0	0	0	42	42
1000	1	34	3	0	0	0	38	37
1100	0	41	2	1	0	0	44	45
1200	0	43	3	0	0	0	46	46
1300	1	55	9	0	0	0	65	64
1400	0	56	5	0	0	0	61	61
1500	0	55	4	1	0	0	60	61
1600	0	53	3	1	0	0	57	58
1700	0	83	12	1	0	0	96	97
1800	0	76	7	0	0	0	83	83
1900	0	27	5	0	0	0	32	32
2000	0	29	4	1	0	0	34	35
2100	0	18	2	0	0	0	20	20
2200	0	12	1	0	0	0	13	13
2300	0	10	0	0	0	0	10	10
07-19	2	624	63	6	0	0	695	696
06-22	2	719	76	7	0	0	804	806
06-00	2	741	77	7	0	0	827	829
00-00	2	760	83	7	0	0	852	854

Peaks	Time	Vehicles	PCU's
AM	0800	63	64
IP	1300	65	64.2
PM	1700	96	96.5





Traffinomics Limited for
Alan Lipscombe Traffic

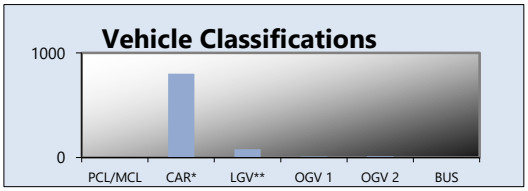
TRAFFINOMICS LIMITED

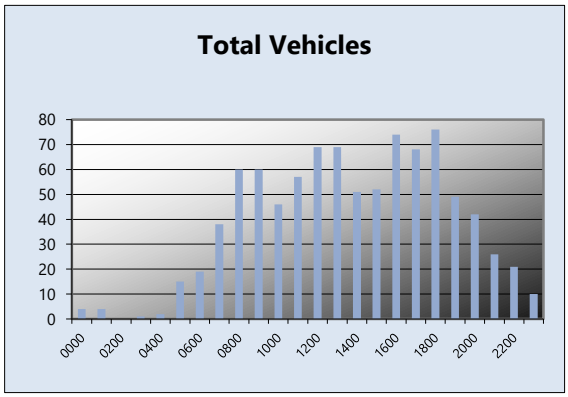
MULLIGAR TRAFFIC COUNT/SPEED SURVEY **Friday 14 June 2019**
AUTOMATIC TRAFFIC COUNT **TRA/19/145**

SITE 01
SOUTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	4	0	0	0	0	4	4
0100	0	4	0	0	0	0	4	4
0200	0	0	0	0	0	0	0	0
0300	0	1	0	0	0	0	1	1
0400	0	2	0	0	0	0	2	2
0500	0	11	4	0	0	0	15	15
0600	0	14	4	1	0	0	19	20
0700	0	33	3	0	2	0	38	41
0800	1	53	3	2	0	1	60	61
0900	1	53	6	0	0	0	60	59
1000	0	37	9	0	0	0	46	46
1100	0	47	7	1	2	0	57	60
1200	0	61	6	1	1	0	69	71
1300	0	62	4	2	1	0	69	71
1400	0	45	5	1	0	0	51	52
1500	1	46	3	0	1	1	52	54
1600	0	67	6	1	0	0	74	75
1700	0	62	4	1	1	0	68	70
1800	1	70	5	0	0	0	76	75
1900	0	42	6	0	1	0	49	50
2000	1	39	0	0	2	0	42	44
2100	0	23	2	0	1	0	26	27
2200	0	18	2	0	1	0	21	22
2300	0	9	1	0	0	0	10	10
07-19	4	636	61	9	8	2	720	734
06-22	5	754	73	10	12	2	856	875
06-00	5	781	76	10	13	2	887	907
00-00	5	803	80	10	13	2	913	933

Peaks	Time	Vehicles	PCU's
AM	0800	60	61.2
IP	1200	69	71.3
PM	1800	76	75.2





Traffinomics Limited for
Alan Lipscombe Traffic

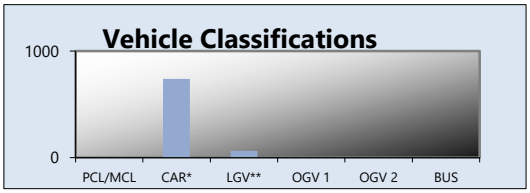
TRAFFINOMICS LIMITED

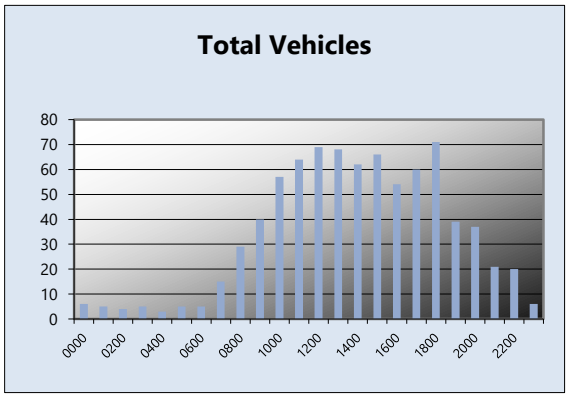
MULLIGAR TRAFFIC COUNT/SPEED SURVEY **Saturday 15 June 2019**
AUTOMATIC TRAFFIC COUNT **TRA/19/145**

SITE 01
SOUTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	6	0	0	0	0	6	6
0100	0	5	0	0	0	0	5	5
0200	0	4	0	0	0	0	4	4
0300	0	5	0	0	0	0	5	5
0400	0	2	1	0	0	0	3	3
0500	0	3	2	0	0	0	5	5
0600	0	3	2	0	0	0	5	5
0700	1	13	1	0	0	0	15	14
0800	0	22	7	0	0	0	29	29
0900	0	36	3	1	0	0	40	41
1000	0	54	3	0	0	0	57	57
1100	0	58	5	0	1	0	64	65
1200	0	61	7	1	0	0	69	70
1300	1	64	3	0	0	0	68	67
1400	0	59	3	0	0	0	62	62
1500	2	61	3	0	0	0	66	64
1600	0	49	5	0	0	0	54	54
1700	0	51	8	1	0	0	60	61
1800	0	64	7	0	0	0	71	71
1900	0	37	2	0	0	0	39	39
2000	0	36	1	0	0	0	37	37
2100	0	20	1	0	0	0	21	21
2200	0	19	1	0	0	0	20	20
2300	0	6	0	0	0	0	6	6
07-19	4	592	55	3	1	0	655	655
06-22	4	688	61	3	1	0	757	757
06-00	4	713	62	3	1	0	783	783
00-00	4	738	65	3	1	0	811	811

Peaks	Time	Vehicles	PCU's
AM	0900	40	40.5
IP	1200	69	69.5
PM	1800	71	71





Traffinomics Limited for
Alan Lipscombe Traffic

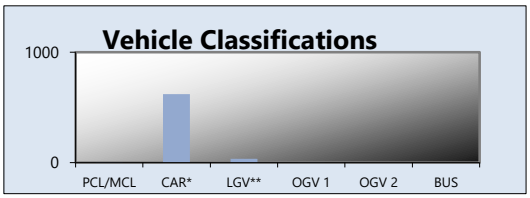
TRAFFINOMICS LIMITED

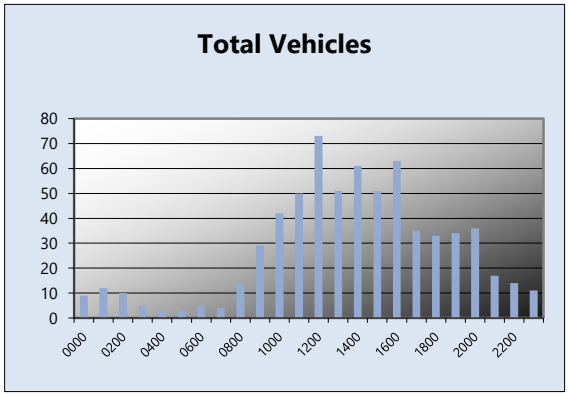
MULLIGAR TRAFFIC COUNT/SPEED SURVEY **Sunday 16 June 2019**
AUTOMATIC TRAFFIC COUNT **TRA/19/145**

SITE 01
SOUTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	8	1	0	0	0	9	9
0100	0	12	0	0	0	0	12	12
0200	0	10	0	0	0	0	10	10
0300	0	5	0	0	0	0	5	5
0400	0	3	0	0	0	0	3	3
0500	0	3	0	0	0	0	3	3
0600	0	4	1	0	0	0	5	5
0700	0	4	0	0	0	0	4	4
0800	0	12	2	0	0	0	14	14
0900	1	28	0	0	0	0	29	28
1000	2	34	5	1	0	0	42	41
1100	1	46	3	0	0	0	50	49
1200	0	69	4	0	0	0	73	73
1300	0	49	2	0	0	0	51	51
1400	2	56	3	0	0	0	61	59
1500	1	47	3	0	0	0	51	50
1600	0	60	3	0	0	0	63	63
1700	0	32	3	0	0	0	35	35
1800	0	33	0	0	0	0	33	33
1900	0	32	2	0	0	0	34	34
2000	0	35	1	0	0	0	36	36
2100	0	16	1	0	0	0	17	17
2200	0	13	1	0	0	0	14	14
2300	0	11	0	0	0	0	11	11
07-19	7	470	28	1	0	0	506	501
06-22	7	557	33	1	0	0	598	593
06-00	7	581	34	1	0	0	623	618
00-00	7	622	35	1	0	0	665	660

Peaks	Time	Vehicles	PCU's
AM	0900	29	28.2
IP	1200	73	73
PM	1600	63	63





Traffinomics Limited for
Alan Lipscombe Traffic

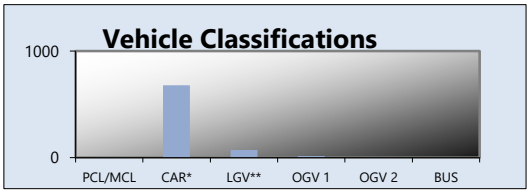
TRAFFINOMICS LIMITED

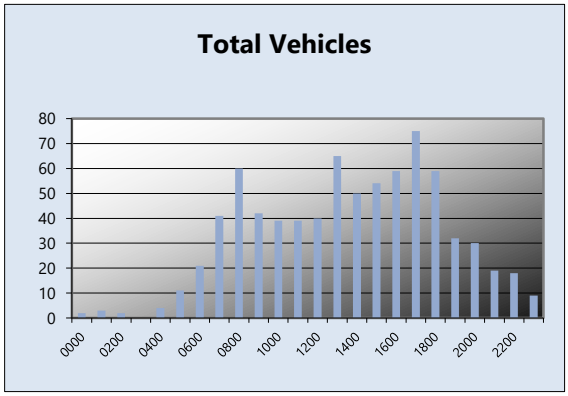
MULLIGAR TRAFFIC COUNT/SPEED SURVEY **Monday 17 June 2019**
AUTOMATIC TRAFFIC COUNT **TRA/19/145**

SITE 01
SOUTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	2	0	0	0	0	2	2
0100	0	2	1	0	0	0	3	3
0200	0	2	0	0	0	0	2	2
0300	0	0	0	0	0	0	0	0
0400	0	3	1	0	0	0	4	4
0500	0	8	3	0	0	0	11	11
0600	0	16	5	0	0	0	21	21
0700	0	37	3	1	0	0	41	42
0800	0	49	8	3	0	0	60	62
0900	1	35	6	0	0	0	42	41
1000	0	30	7	2	0	0	39	40
1100	0	35	3	0	0	1	39	40
1200	0	38	2	0	0	0	40	40
1300	0	54	9	2	0	0	65	66
1400	0	44	6	0	0	0	50	50
1500	1	46	3	3	1	0	54	56
1600	0	51	7	0	0	1	59	60
1700	0	73	2	0	0	0	75	75
1800	0	55	2	2	0	0	59	60
1900	0	30	2	0	0	0	32	32
2000	1	26	2	1	0	0	30	30
2100	0	19	0	0	0	0	19	19
2200	1	17	0	0	0	0	18	17
2300	0	8	1	0	0	0	9	9
07-19	2	547	58	13	1	2	623	631
06-22	3	638	67	14	1	2	725	733
06-00	4	663	68	14	1	2	752	759
00-00	4	680	73	14	1	2	774	781

Peaks	Time	Vehicles	PCU's
AM	0800	60	61.5
IP	1300	65	66
PM	1700	75	75





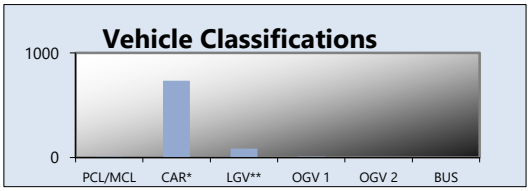
TRAFFINOMICS LIMITED

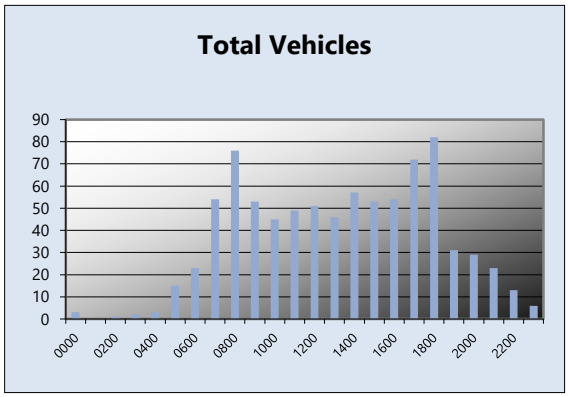
MULLIGAR TRAFFIC COUNT/SPEED SURVEY **Tuesday 18 June 2019**
AUTOMATIC TRAFFIC COUNT **TRA/19/145**

SITE 01
SOUTHBOUND

TIME	PCL/MCL	CAR*	LGV**	OGV 1	OGV 2	BUS	TOTAL	PCU
0000	0	3	0	0	0	0	3	3
0100	0	0	0	0	0	0	0	0
0200	0	1	0	0	0	0	1	1
0300	0	2	0	0	0	0	2	2
0400	0	2	1	0	0	0	3	3
0500	0	12	3	0	0	0	15	15
0600	0	18	3	2	0	0	23	24
0700	0	45	7	1	1	0	54	56
0800	0	70	5	1	0	0	76	77
0900	0	48	4	1	0	0	53	54
1000	1	38	6	0	0	0	45	44
1100	0	45	4	0	0	0	49	49
1200	1	42	7	1	0	0	51	51
1300	1	38	7	0	0	0	46	45
1400	0	53	4	0	0	0	57	57
1500	0	47	4	2	0	0	53	54
1600	0	46	8	0	0	0	54	54
1700	1	62	6	2	1	0	72	74
1800	3	74	5	0	0	0	82	80
1900	0	27	4	0	0	0	31	31
2000	0	25	4	0	0	0	29	29
2100	2	19	2	0	0	0	23	21
2200	0	13	0	0	0	0	13	13
2300	0	5	1	0	0	0	6	6
07-19	7	608	67	8	2	0	692	693
06-22	9	697	80	10	2	0	798	798
06-00	9	715	81	10	2	0	817	817
00-00	9	735	85	10	2	0	841	841

Peaks	Time	Vehicles	PCU's
AM	0800	76	76.5
IP	1400	57	57
PM	1800	82	79.6

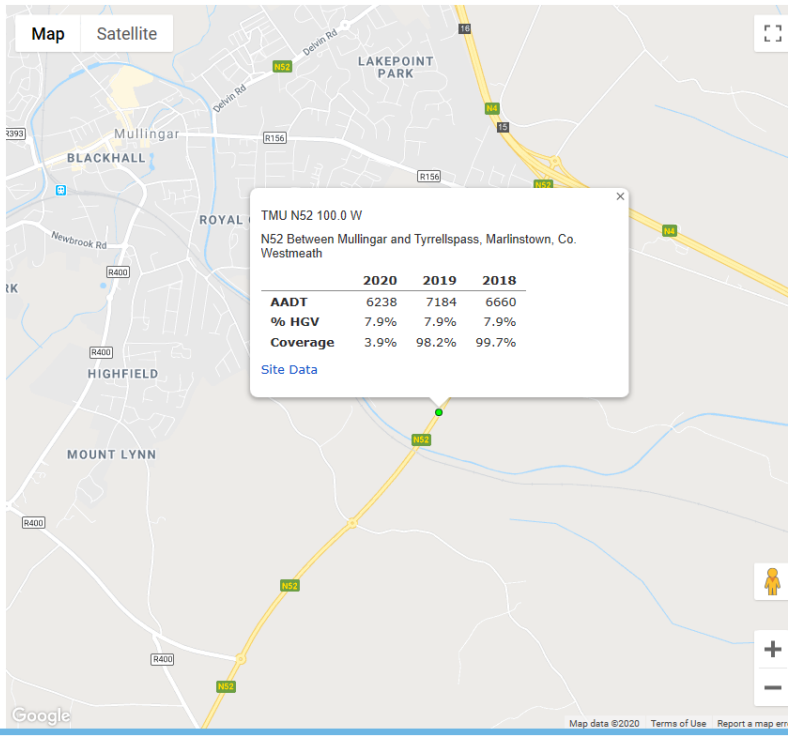




Appendix C TII Automatic Traffic Count Data for the N52, Mullingar, 2018

Bonneagar Iompair Éireann
Transport Infrastructure Ireland
Traffic

- ABOUT THE WEBSITE
- MAP INTERFACE
- SITE LIST
- SEARCH FUNCTION
- SITE DATA
- EXPLANATION OF REPORTS
- IMPORTANT NOTICE



TII Traffic Data Site

Transport Infrastructure Ireland
Parkgate Business Centre
Parkgate Street
Dublin 8
D08 DK10

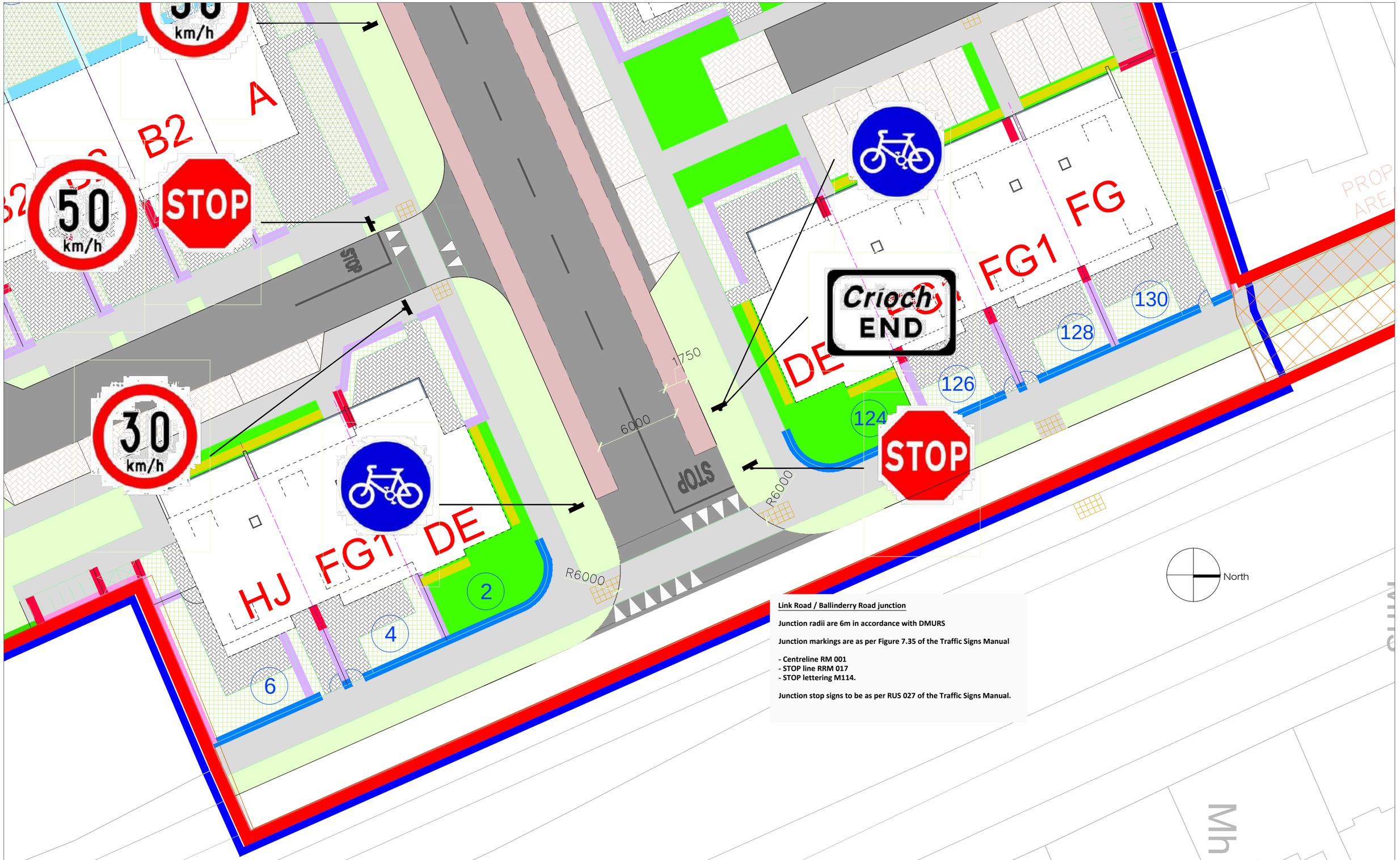
datainfo@tii.ie
P: +353 1 6602511
F: +353 1 6680009

Channel: All directions ▾ Precision: Normal ▾

Date	Monday - Friday 12Hr	16Hr	18Hr	24Hr	Monday - Sunday 12Hr	16Hr	18Hr	24Hr
Jan 2018	5269	6023	6147	6289	4819	5521	5644	5781
Feb 2018	5677	6490	6629	6785	5246	6005	6143	6303
Mar 2018	5255	6063	6207	6350	4748	5482	5618	5761
Apr 2018	5892	6875	7041	7208	5495	6416	6576	6745
May 2018	6276	7339	7539	7735	5940	6972	7176	7376
Jun 2018	6109	7137	7341	7528	5679	6657	6859	7045
Jul 2018	5811	6811	7008	7181	5436	6403	6600	6776
Aug 2018	5928	6963	7145	7319	5621	6628	6812	6990
Sep 2018	6645	7704	7868	8048	6002	6985	7144	7320
Oct 2018	6076	7006	7163	7329	5617	6483	6636	6806
Nov 2018	6218	7123	7274	7452	5696	6525	6671	6844
Dec 2018	5352	6125	6272	6423	5026	5743	5885	6043

Appendix D Internal layout

Figure D1 Proposed L1132 Ballinderry Road / development link street junction layout
Figure D2 Proposed internal junction markings and signs
Figure D3 Internal visibility splays and forward visibility
Figure D4 Proposed minor alterations in response to the Stage 1 Road Safety Audit



NOTES:

PLANNING DRAWING ONLY - NOT FOR CONSTRUCTION PURPOSES

Base mapping provided by Coughlan Associates and Doyle + O'Troithigh Landscape Architects

Figure D1 Proposed L1132 Ballinderry Road / development link street junction layout

PROJECT:	Housing Development, Ballinderry Road, Mullingar, County Westmeath		
CLIENT:	Consdorf Investment ICAV	SCALE:	1:250
PROJECT NO: 8060	DATE: 11.03.22	DRAWN BY:	AL

ALAN LIPSCOMBE
TRAFFIC & TRANSPORT CONSULTANTS

NOTES:

PLANNING DRAWING ONLY - NOT FOR CONSTRUCTION PURPOSES

Base mapping provided by Coughlan Associates and Doyle + O'Troithigh Landscape Architects

Figure D2 Proposed internal junction markings and signs

PROJECT:	Housing Development, Ballinderry Road, Mullingar, County Westmeath		
CLIENT:	Consdorf Investment ICAV	SCALE:	1:1000
PROJECT NO: 8060	DATE: 08.03.22	DRAWN BY:	AL

ALAN LIPSCOMBE
TRAFFIC & TRANSPORT CONSULTANTS

NOTES:

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Base mapping provided by Coughlan Associates and Doyle + O'Troithigh Landscape Architects

Figure D3 Internal visibility splays and forward visibility (2.4m x 45m for 50km/h and 2.4m x 23m for 30km/h)

PROJECT:	Housing Development, Ballinderry Road, Mullingar, County Westmeath		
CLIENT:	Consdorf Investment ICAV	SCALE:	1:1000
PROJECT NO: 8060	DATE: 11.03.22	DRAWN BY:	AL

ALAN LIPSCOMBE
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NOTES:

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Base mapping provided by Coughlan Associates and Doyle + O'Troithigh Landscape Architects

Figure D4 Proposed minor altertations in response to the Stage 1 Road Safety Audit

PROJECT:	Housing Development, Ballinderry Road, Mullingar, County Westmeath		
CLIENT:	Consdorf Investment ICAV	SCALE:	1:1000
PROJECT NO: 8060	DATE: 16.03.22	DRAWN BY:	AL

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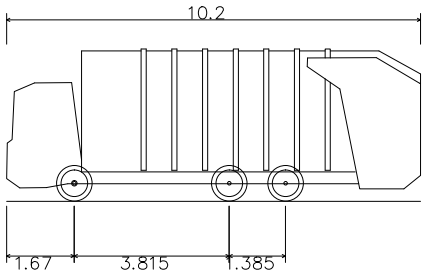
Appendix E Swept path analysis

Figure E1 Refuse vehicle profile (10.20m long by 2.53 wide)
Figure E2 Removals van profile (9.35m long by 2.46m wide)
Figure E3 Fire tender profile (8.7m long by 2.2m wide)
Figure E4 Estate car profile (4.7m long by 1.8m wide)
Figure E5 Refuse vehicle autotrack assessment
Figure E6 Removals van autotrack assessment
Figure E7 Fire tender autotrack assessment
Figure E8 Estate car autotrack assessment



Phoenix 2 Duo (P2–12W with Elite 6x4 chassis)	
Overall Length	10.200m
Overall Width	2.530m
Overall Body Height	3.751m
Min Body Ground Clearance	0.304m
Track Width	2.500m
Lock to Lock Time	4.00s
Kerb to Kerb Turning Radius	7.800m

NOTES:

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Base mapping provided by Coughlan Associates and Doyle + O'Troithigh Landscape Architects

Figure E1 Refuse vehicle profile (10.20m long x 2.53m wide)

PROJECT:	Housing Development, Ballinderry Road, Mullingar, County Westmeath		
CLIENT:	Consdorf Investment ICAV	SCALE:	NTS
PROJECT NO: 8060	DATE: 08.03.22	DRAWN BY:	AL

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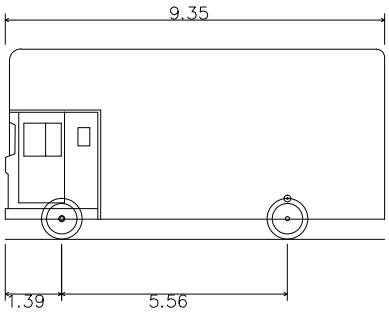

Removals Van	
Overall Length	9.350m
Overall Width	2.460m
Overall Body Height	4.680m
Min Body Ground Clearance	0.491m
Track Width	2.060m
Lock to Lock Time	5.00s
Kerb to Kerb Turning Radius	10.900m

NOTES:

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Base mapping provided by Coughlan Associates and Doyle + O'Troithigh Landscape Architects

Figure E2 Removals van profile (9.35m long x 2.46m wide)

PROJECT:	Housing Development, Ballinderry Road, Mullingar, County Westmeath		
CLIENT:	Consdorf Investment ICAV	SCALE:	NTS
PROJECT NO: 8060	DATE: 08.03.22	DRAWN BY:	AL

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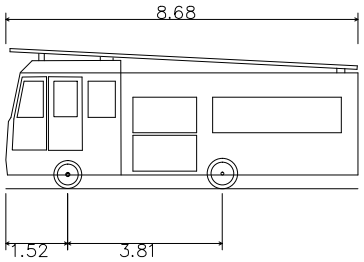

DB32 Fire Appliance	
Overall Length	8.680m
Overall Width	2.180m
Overall Body Height	3.452m
Min Body Ground Clearance	0.337m
Max Track Width	2.121m
Lock to Lock Time	6.00s
Kerb to Kerb Turning Radius	7.910m

NOTES:

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Base mapping provided by Coughlan Associates and Doyle + O'Troithigh Landscape Architects

Figure E3 Fire tender profile (8.70m long x 2.2m wide)

PROJECT:	Housing Development, Ballinderry Road, Mullingar, County Westmeath		
CLIENT:	Consdorf Investment ICAV	SCALE:	NTS
PROJECT NO: 8060	DATE: 08.03.22	DRAWN BY:	AL

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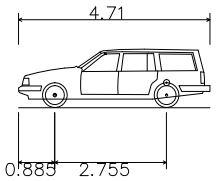

Estate Car (2006)	
Overall Length	4.710m
Overall Width	1.804m
Overall Body Height	1.442m
Min Body Ground Clearance	0.207m
Max Track Width	1.756m
Lock to Lock Time	4.00s
Kerb to Kerb Turning Radius	5.950m

NOTES:

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Base mapping provided by Coughlan Associates and Doyle + O'Troithigh Landscape Architects

Figure E4 Estate car profile (4.70m long x 1.80m wide)

PROJECT:	Housing Development, Ballinderry Road, Mullingar, County Westmeath		
CLIENT:	Consdorf Investment ICAV	SCALE:	NTS
PROJECT NO: 8060	DATE: 08.03.22	DRAWN BY:	AL

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NOTES:

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Base mapping provided by Coughlan Associates and Doyle + O'Troithigh Landscape Architects

Figure E5 Refuse vehicle autotrack assessment

PROJECT:	Housing Development, Ballinderry Road, Mullingar, County Westmeath		
CLIENT:	Consdorf Investment ICAV	SCALE:	1:1000
PROJECT NO: 8060	DATE: 08.03.22	DRAWN BY:	AL

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NOTES:

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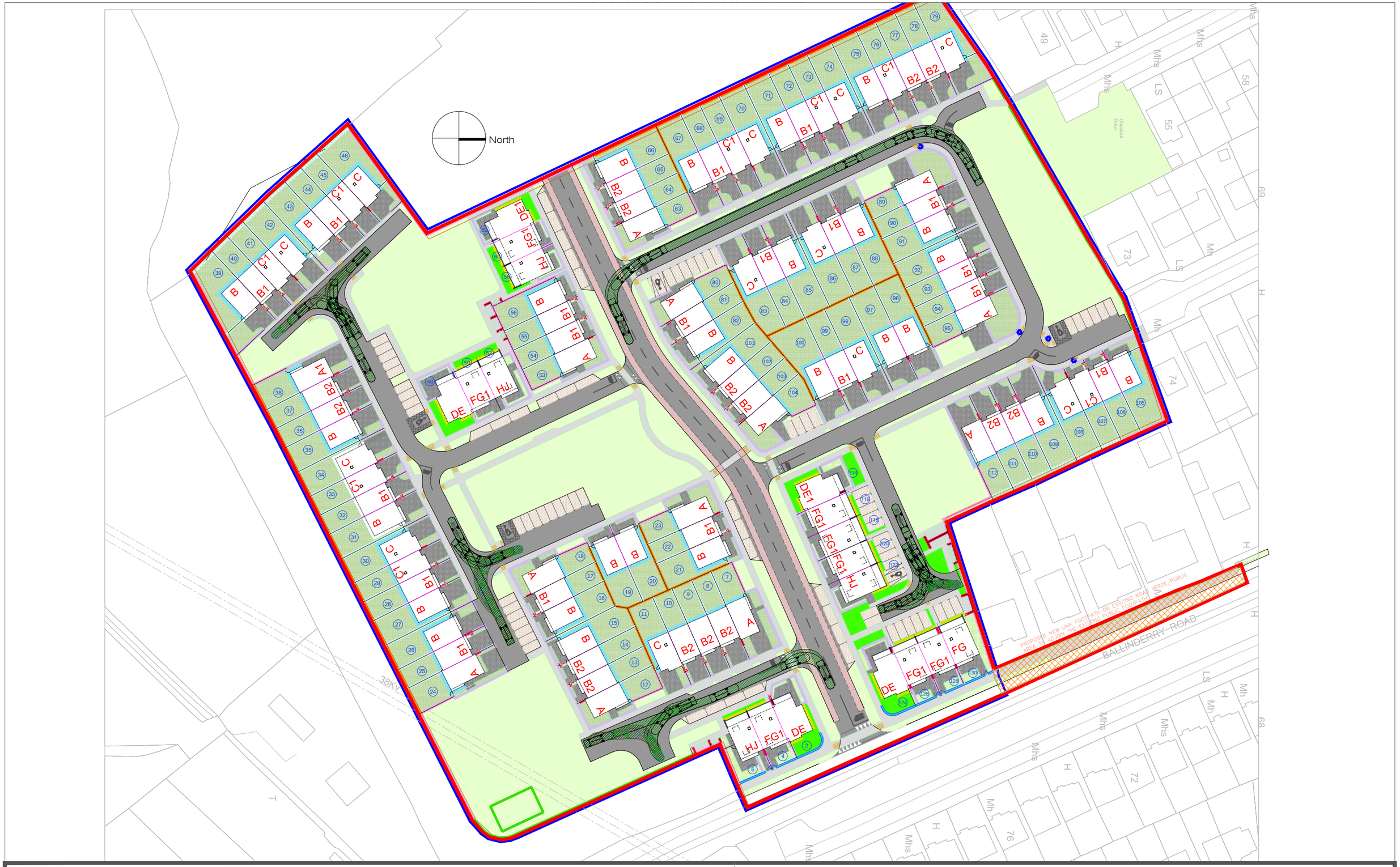
Base mapping provided by Coughlan Associates and Doyle + O'Troithigh Landscape Architects

Figure E6 Removals van autotrack assessment

PROJECT:	Housing Development, Ballinderry Road, Mullingar, County Westmeath		
CLIENT:	Consdorf Investment ICAV	SCALE:	1:1000
PROJECT NO:	8060	DATE: 08.03.22	DRAWN BY: AL

ALAN LIPSCOMBE
TRAFFIC & TRANSPORT CONSULTANTS



NOTES:

PLANNING DRAWING ONLY - NOT FOR CONSTRUCTION PURPOSES

Base mapping provided by Coughlan Associates and Doyle + O'Troithigh Landscape Architects

Figure E7 Fire tender autotrack assessment

PROJECT:	Housing Development, Ballinderry Road, Mullingar, County Westmeath		
CLIENT:	Consdorf Investment ICAV	SCALE:	1:1000
PROJECT NO: 8060	DATE: 08.03.22	DRAWN BY:	AL

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NOTES:

PLANNING DRAWING ONLY - NOT FOR CONSTRUCTION PURPOSES

Base mapping provided by Coughlan Associates and Doyle + O'Troithigh Landscape Architects

Figure E8 Estate car autotrack assessment

PROJECT:	Housing Development, Ballinderry Road, Mullingar, County Westmeath		
CLIENT:	Consdorf Investment ICAV	SCALE:	1:1000
PROJECT NO: 8060	DATE: 08.03.22	DRAWN BY:	AL

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Appendix F PICADY output for L1132 Ballinderry Road / access junction, with development, PM Peak hour, year 2039

PICADY
GUI Version: 5.1 AD Analysis Program Release: 4.0 (SEPT 2008) © Copyright TRL Limited, 2008 Adapted from PICADY/3 which is Crown Copyright by permission of the controller of HMSO
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TRL Limited Crowthorne House Nine Mile Ride Wokingham, Berks. RG40 3GA, UK Tel: +44 (0)1344 770758 Fax:+44 (0)1344 770864 E-mail: software@trl.co.uk Web: www.trlsoftware.co.uk
The user of this computer program for the solution of an engineering problem is in no way relieved of their responsibility for the correctness of the solution

Run Analysis

Parameter	Values
File Run	C:\AL Traffic jobs\Picady - Ballinderry Road\PM 2039 with dev.vpi
Date Run	09 March 2022
Time Run	11:08:39
Driving Side	Drive On The Left

Arm Names and Flow Scaling Factors

Arm	Arm Name	Flow Scaling Factor (%)
Arm A	Ballinderry Road (south)	100
Arm B	Development access	100
Arm C	Ballinderry Road (north)	100

Stream Labelling Convention

Stream A-B contains traffic going from A to B etc.

Run Information

Parameter	Values
Run Title	Ballinderry Road Development
Location	Mullingar
Date	17 January 2020
Enumerator	adl [ADL-PC]
Job Number	8060
Status	TIA
Client	-
Description	-

Errors and Warnings

Parameter	Values
Warning	No Errors Or Warnings

Geometric Data

Geometric Parameters

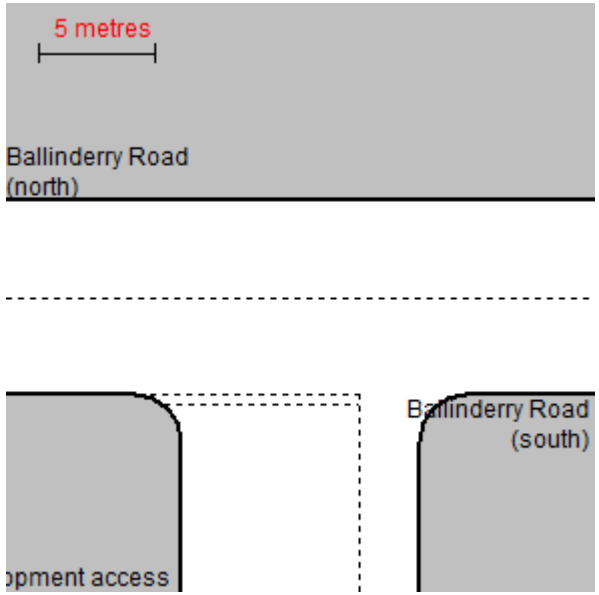
Parameter	Minor Arm B
Major Road Carriageway Width (m)	6.00
Major Road Kerbed Central Reserve Width (m)	0.00
Major Road Right Turning Lane Width (m)	2.20
Minor Road Width 0m Back from Junction (m)	7.50
Minor Road Width 5m Back from Junction (m)	3.70
Minor Road Width 10m Back from Junction (m)	3.00
Minor Road Width 15m Back from Junction (m)	3.00
Minor Road Width 20m Back from Junction (m)	3.00
Minor Road Derived Flare Length (PCU)	0.000
Minor Road Visibility To Right (m)	50
Minor Road Visibility To Left (m)	50
Major Road Right Turn Visibility (m)	60
Major Road Right Turn Blocks Traffic	Yes

Slope and Intercept Values

Stream	Intercept for Stream B-A	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B-A	0.000	0.000	0.000	0.000	0.000
B-C	0.000	0.000	0.000	-	-
C-B	608.710	0.236	0.236	-	-

Note: Streams may be combined in which case capacity will be adjusted
These values do not allow for any site-specific corrections

Junction Diagram



Demand Data

Modelling Periods

Parameter	Period	Duration (min)	Segment Length (min)
First Modelling Period	16:45-18:15	90	15

ODTAB Turning Counts

Demand Set: Ballinderry Road Development
Modelling Period: 16:45-18:15

From/To	Arm A	Arm B	Arm C
Arm A	0.0	42.0	147.0
Arm B	18.0	0.0	21.0
Arm C	129.0	36.0	0.0

ODTAB Synthesised Flows

Demand Set: Ballinderry Road Development
Modelling Period: 16:45-18:15

Arm	Rising Time	Rising Flow (veh/min)	Peak Time	Peak Flow (veh/min)	Falling Time	Falling Flow (veh/min)
Arm A	17:00	2.362	17:30	3.544	18:00	2.362
Arm B	17:00	0.488	17:30	0.731	18:00	0.488
Arm C	17:00	2.063	17:30	3.094	18:00	2.063

Heavy Vehicles Percentages

Demand Set: Ballinderry Road Development
Modelling Period: 16:45-18:15

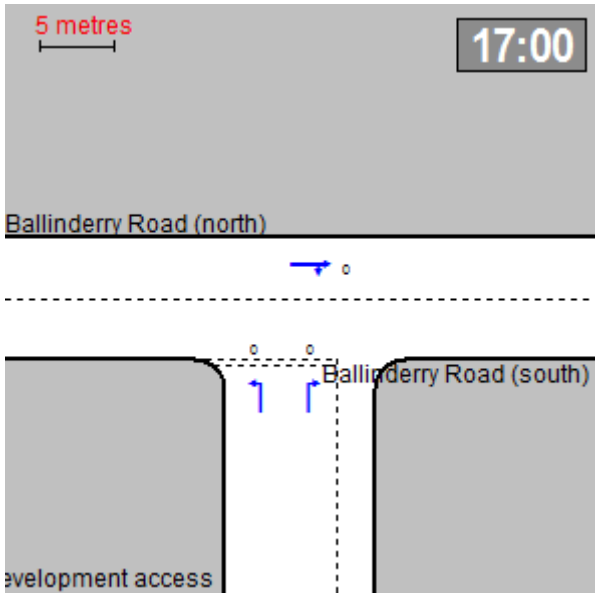
From/To	Arm A	Arm B	Arm C
Arm A	-	10.0	10.0
Arm B	10.0	-	10.0
Arm C	10.0	10.0	-

Default proportions of heavy vehicles are used

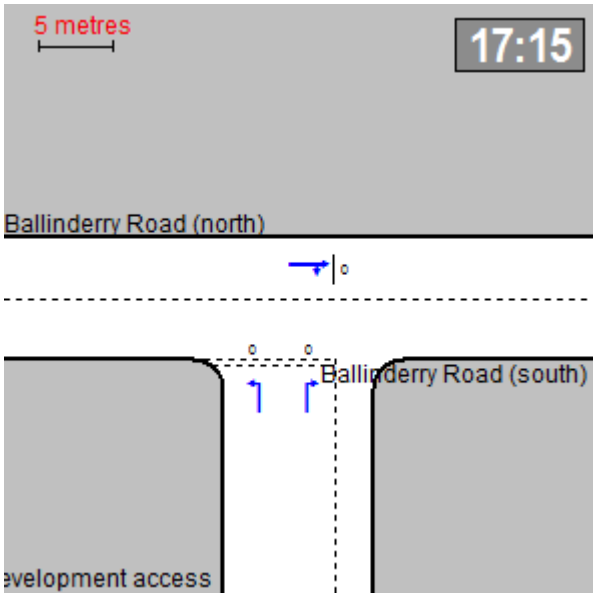
Queue Diagrams

Demand Set: Sum of Demand Sets for Modelling Period: 16:45 - 18:15
Modelling Period: 16:45-18:15
View Extent: 40m

Queue Interval 1: 16:45-17:00

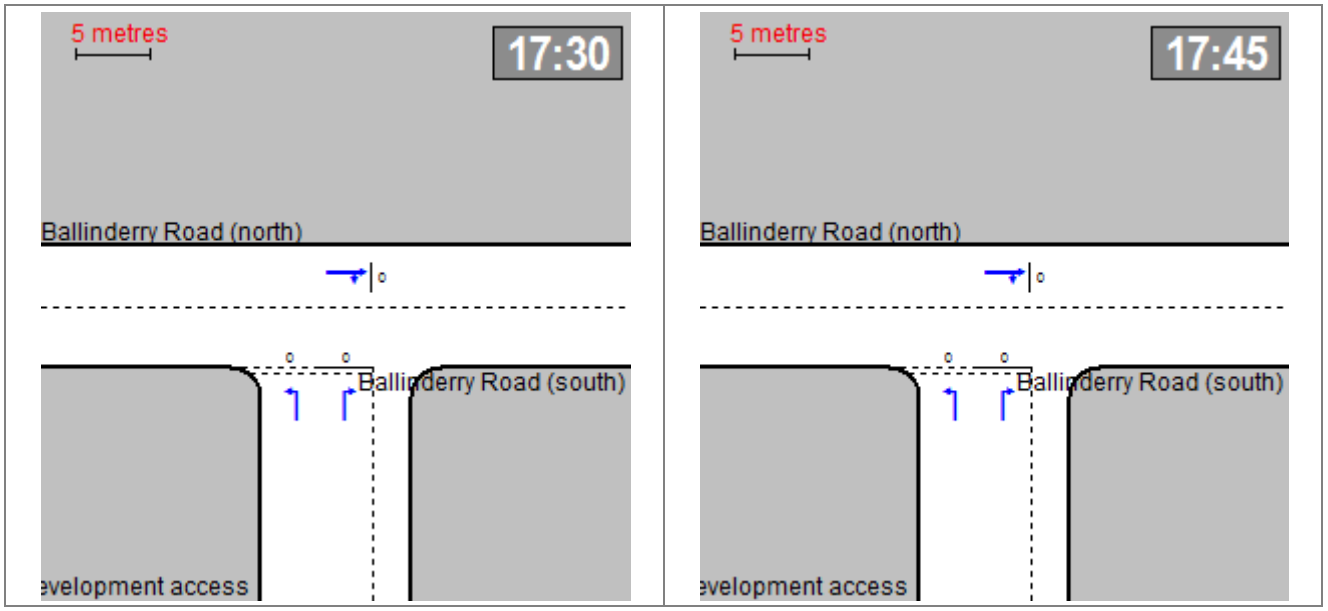


Queue Interval 2: 17:00-17:15

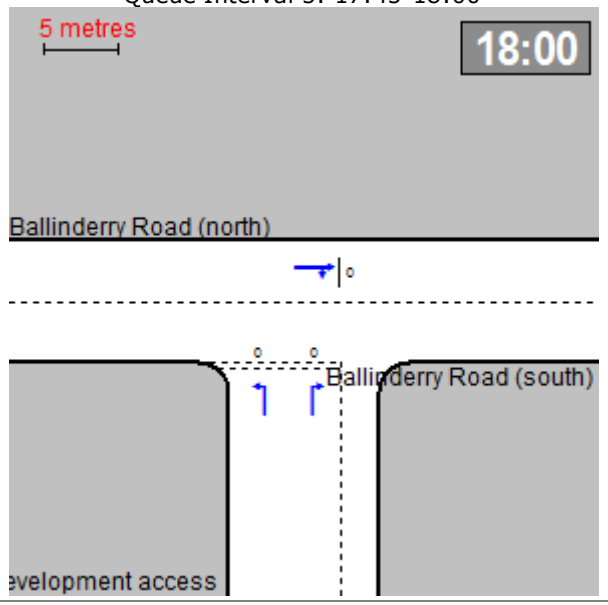


Queue Interval 3: 17:15-17:30

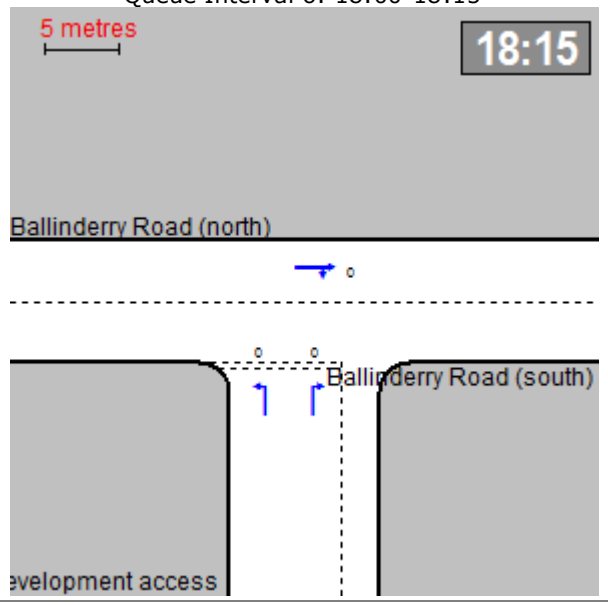
Queue Interval 4: 17:30-17:45


5 metres
17:30
Ballinderry Road (north)
Ballinderry Road (south)
evelopment access
5 metres
17:45
Ballinderry Road (north)
Ballinderry Road (south)
evelopment access

Queue Interval 5: 17:45-18:00

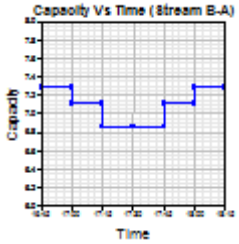


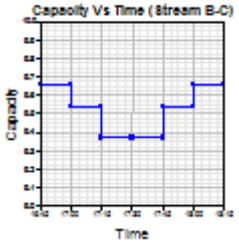
Queue Interval 6: 18:00-18:15

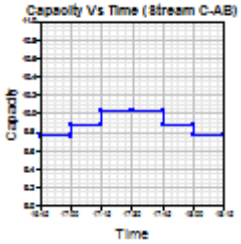


Capacity Graph

Demand Set: Sum of Demand Sets for Modelling Period: 16:45 - 18:15
Modelling Period: 16:45-18:15

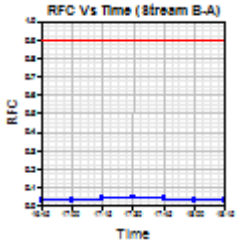


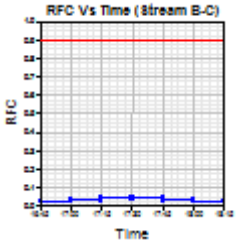


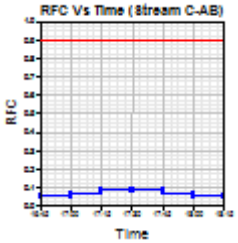


RFC Graph

Demand Set: Sum of Demand Sets for Modelling Period: 16:45 - 18:15
Modelling Period: 16:45-18:15

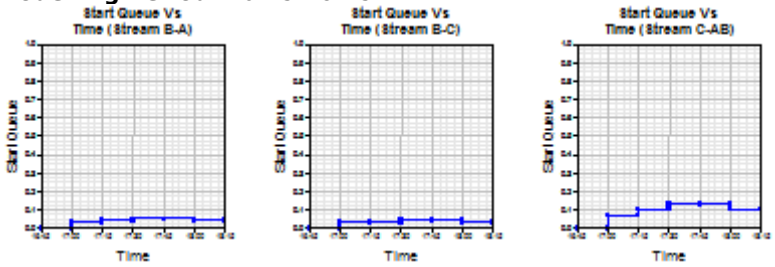






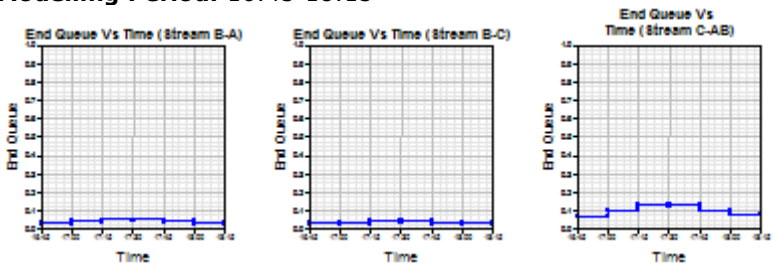
Start Queue Graph

Demand Set: Sum of Demand Sets for Modelling Period: 16:45 - 18:15
Modelling Period: 16:45-18:15



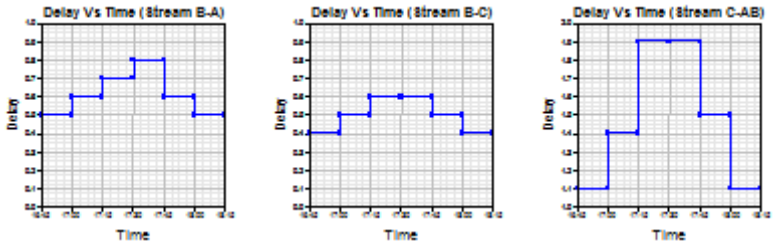
End Queue Graph

Demand Set: Sum of Demand Sets for Modelling Period: 16:45 - 18:15
Modelling Period: 16:45-18:15



Delay Graph

Demand Set: Sum of Demand Sets for Modelling Period: 16:45 - 18:15
Modelling Period: 16:45-18:15



Queues & Delays

Demand Set: Sum of Demand Sets for Modelling Period: 16:45 - 18:15
Modelling Period: 16:45-18:15

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/ segment)	Delay (veh.min/ segment)	Mean Arriving Vehicle Delay (min)
16:45-17:00	B-A	0.23	7.29	0.031	-	0.00	0.03	-	0.5	0.14
	B-C	0.26	9.66	0.027	-	0.00	0.03	-	0.4	0.11
	C-AB	0.54	9.76	0.055	-	0.00	0.07	-	1.1	0.11
	C-A	1.53	-	-	-	-	-	-	-	-
	A-B	0.53	-	-	-	-	-	-	-	-
	A-C	1.84	-	-	-	-	-	-	-	-
Segment	**Stream**	**Demand (veh/min)**	**Capacity (veh/min)**	**RFC**	**Ped. Flow (ped/min)**	**Start Queue (veh)**	**End Queue (veh)**	**Geometric Delay (veh.min/ segment)**	**Delay (veh.min/ segment)**	**Mean Arriving Vehicle Delay (min)**
17:00-17:15	B-A	0.27	7.11	0.038	-	0.03	0.04	-	0.6	0.15
	B-C	0.31	9.54	0.033	-	0.03	0.03	-	0.5	0.11
	C-AB	0.67	9.88	0.068	-	0.07	0.10	-	1.4	0.11
	C-A	1.80	-	-	-	-	-	-	-	-
	A-B	0.63	-	-	-	-	-	-	-	-
	A-C	2.20	-	-	-	-	-	-	-	-
Segment	**Stream**	**Demand (veh/min)**	**Capacity (veh/min)**	**RFC**	**Ped. Flow (ped/min)**	**Start Queue (veh)**	**End Queue (veh)**	**Geometric Delay (veh.min/ segment)**	**Delay (veh.min/ segment)**	**Mean Arriving Vehicle Delay (min)**
17:15-17:30	B-A	0.33	6.86	0.048	-	0.04	0.05	-	0.7	0.15
	B-C	0.39	9.37	0.041	-	0.03	0.04	-	0.6	0.11
	C-AB	0.86	10.03	0.086	-	0.10	0.13	-	1.9	0.11

	C-A	2.17	-	-	-	-	-	-	-	-
	A-B	0.77	-	-	-	-	-	-	-	-
	A-C	2.70	-	-	-	-	-	-	-	-
Segment	**Stream**	**Demand (veh/min)**	**Capacity (veh/min)**	**RFC**	**Ped. Flow (ped/min)**	**Start Queue (veh)**	**End Queue (veh)**	**Geometric Delay (veh.min/ segment)**	**Delay (veh.min/ segment)**	**Mean Arriving Vehicle Delay (min)**
17:30-17:45	B-A	0.33	6.86	0.048	-	0.05	0.05	-	0.8	0.15
	B-C	0.39	9.37	0.041	-	0.04	0.04	-	0.6	0.11
	C-AB	0.86	10.03	0.086	-	0.13	0.13	-	1.9	0.11
	C-A	2.17	-	-	-	-	-	-	-	-
	A-B	0.77	-	-	-	-	-	-	-	-
	A-C	2.70	-	-	-	-	-	-	-	-

Segment	Stream	Demand(veh/min)	Capacity(veh/min)	RFC	Ped.Flow(ped/min)	Start Queue(veh)	End Queue(veh)	Geometric Delay(veh.min/segment)	Delay(veh.min/segment)	Mean ArrivingVehicle Delay(min)
17:45-18:00	B-A	0.27	7.11	0.038	-	0.05	0.04	-	0.6	0.15
	B-C	0.31	9.54	0.033	-	0.04	0.03	-	0.5	0.11
	C-AB	0.67	9.88	0.068	-	0.13	0.10	-	1.5	0.11
	C-A	1.80	-	-	-	-	-	-	-	-
	A-B	0.63	-	-	-	-	-	-	-	-
	A-C	2.20	-	-	-	-	-	-	-	-

Segment	Stream	Demand(veh/min)	Capacity(veh/min)	RFC	Ped.Flow(ped/min)	Start Queue(veh)	End Queue(veh)	Geometric Delay(veh.min/segment)	Delay(veh.min/segment)	Mean ArrivingVehicle Delay(min)
18:00-18:15	B-A	0.23	7.29	0.031	-	0.04	0.03	-	0.5	0.14
	B-C	0.26	9.66	0.027	-	0.03	0.03	-	0.4	0.11
	C-AB	0.54	9.77	0.055	-	0.10	0.08	-	1.1	0.11
	C-A	1.53	-	-	-	-	-	-	-	-
	A-B	0.53	-	-	-	-	-	-	-	-
	A-C	1.84	-	-	-	-	-	-	-	-

Entry capacities marked with an '(X)' are dominated by a pedestrian crossing in that time segment.
In time segments marked with a '(B)', traffic leaving the junction may block back from a crossing so impairing normal operation of the junction.
Delays marked with '##' could not be calculated.

Overall Queues & Delays

Queueing Delay Information Over Whole Period

Demand Set: Sum of Demand Sets for Modelling Period: 16:45 - 18:15
Modelling Period: 16:45-18:15

Stream	Total Demand (veh)	Total Demand (veh/h)	Queueing Delay (min)	Queueing Delay (min/veh)	Inclusive Delay (min)	Inclusive Delay (min/veh)
B-A	24.8	16.5	3.6	0.1	3.6	0.1
B-C	28.9	19.3	3.1	0.1	3.1	0.1
C-AB	62.0	41.3	9.0	0.1	9.0	0.1
C-A	165.1	110.1	-	-	-	-
A-B	57.8	38.5	-	-	-	-
A-C	202.3	134.9	-	-	-	-

All	**540.9**	**360.6**	**15.7**	**0.0**	**15.7**	**0.0**

Delay is that occurring only within the time period.
Inclusive delay includes delay suffered by vehicles which are still queuing after the end of the time period.
These will only be significantly different if there is a large queue remaining at the end of the time period.

PICADY 5 Run Successful