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PROJECT: Proposed Residential Development and Car Park at Lands at
Railway Street, Portlaoise, Co. Laois

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EXECUTIVE SUMMARY

Jason Redmond Associates (JRA) were appointed by Ardain Developments Ltd to provide Civil Engineering Consultancy Services in respect of a planning application for a proposed residential development of approximately 68nr residential dwellings and 93 public car park spaces, to be constructed to a greenfield site at Railway Street, Portlaoise, Co Laois. Part of the brief was to advise on the Road Capacity, Road Safety, Layout and Design issues associated with a proposal to utilise existing road access.

The brief requires for JRA to produce a Traffic and Transport Assessment for the proposed extension works in respect of the Traffic Modelling, PICADY Analysis, Trip Generation Assignment and Distribution.

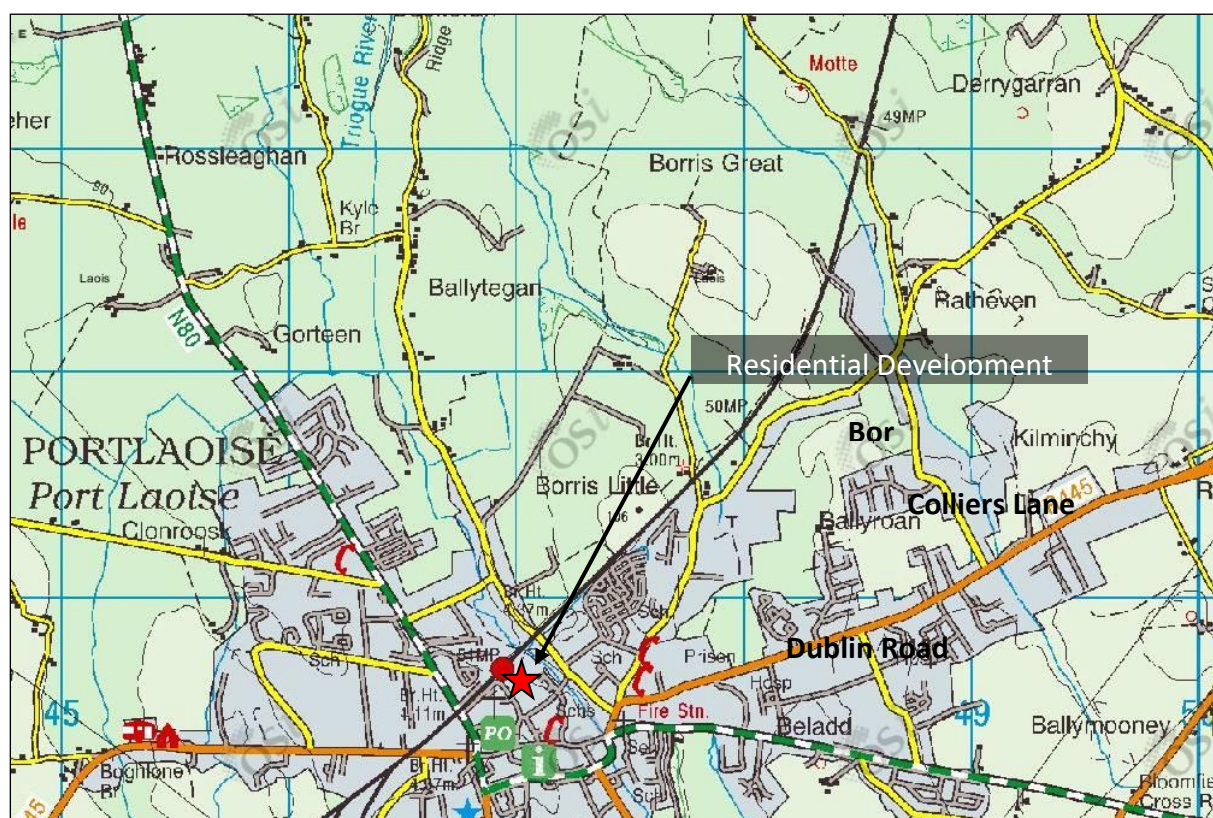
This TTA report addresses the capacity issues associated with the existing junction between Railway street and adjacent road access to Midlands Park Hotel and car park for vehicular traffic, both for the year of opening (2022) and for an assessment year of 10 years after the date of opening (2032). The analysis and assessment contained within this report confirms that there are no capacity concerns that would warrant refusal of the proposed scheme by Laois County Council (LCC)

This report will form part of the Part 8 planning application submission for the proposed residential development.

1. INTRODUCTION

In order to assess the current levels of operation of the existing road network, a traffic survey was carried out by JRA. This traffic survey was carried out on Thursday 5th March 2020, during a period of school opening, and consisted of a full traffic count at the Railway Street junction to be assessed during the A.M. hours of 8:00-9:30 and during the P.M. hours of 16:30-18:00.

As described, the development lands are located off the Railway Street, and a site location map is included as Figure 1.1 below.



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Figure 1.1 – Site Location Plan

The existing site consists of a greenfield site of approx. 2.98 hectares in size. The proposed Railway Street residential development is located to the west of Portlaoise Train Station, with Portlaoise Further Education and Training Centre located to the south-east of the site. A layout plan showing the existing junction location is included in **Appendix A**.

2. RAILWAY STREET. JUNCTION ANALYSIS

2.1 General information

The proposed access junction is located between the Portlaoise Train Station and the roundabout at Odeon Cinema (Portlaoise). The Railway Street currently operates as a 2-lane road, with 1 lane in either direction. The road has an urban speed restriction of 50kph with the width of approximately 6.75m. The overall width of the road adjacent to the junction is approximately 6.1m. This junction has been represented graphically in Figure 2.1 below.

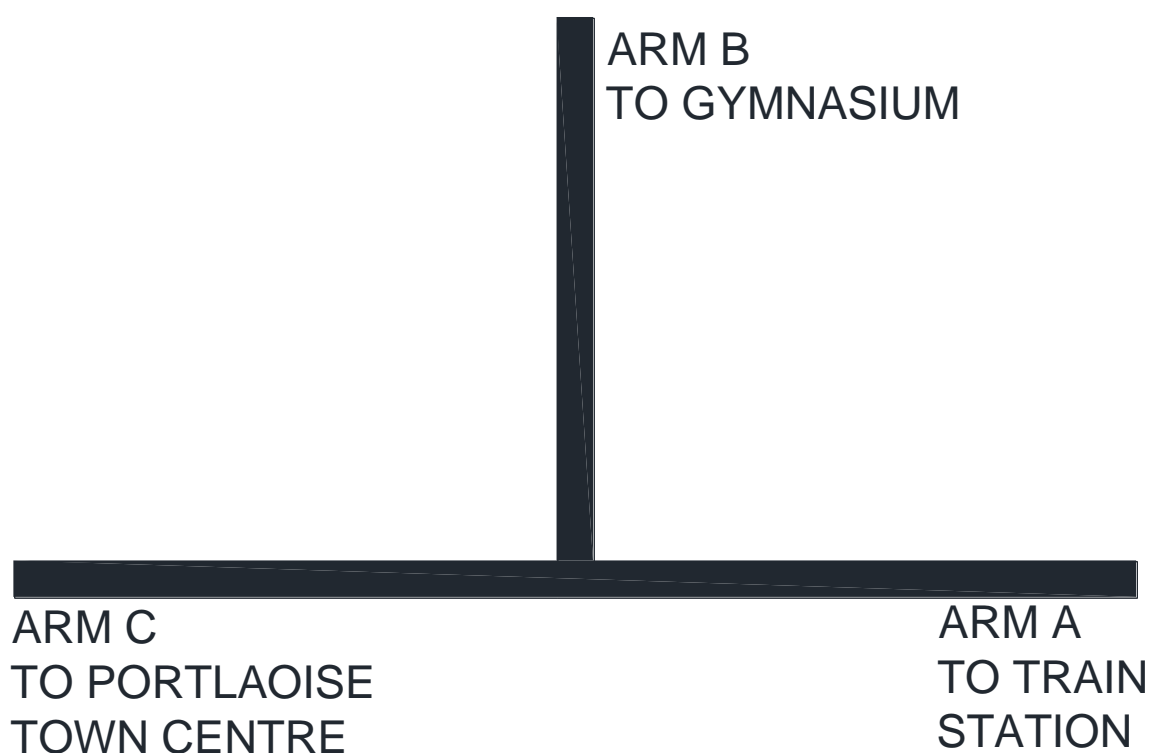


Figure 2.1 – Railway Street Junction. Schematic view.

This intersection consists of a 3-arm junction located at the entrance to the Gymnasium of Midlands Park Hotel. Proposed 4th arm will be built across Arm B.

There are footpaths present on either side of Railway Street and there is a footpath on the north side of the road heading to the Gymnasium of Midlands Park Hotel. There were many pedestrians and some cyclists noted along either road during the survey.

2.2 Morning Traffic levels

The March 2020 survey indicated that during the morning period a total of 332nr passenger car units travelled along the Railway Street towards Portlaoise Town Centre, with 79nr passenger car units travelling north-west towards Portlaoise Train Station. Of the 332nr passenger car units travelling towards Portlaoise Town Centre, 18nr passenger car units turned right towards Gymnasium, 314nr travelled straight through towards Odeon Cinema. The 79nr passenger car units travelling towards the Train station, 10nr passenger car units turned right towards Gymnasium, 69nr travelled straight through the junction, 28 cars came out from Gymnasium Road. These levels of traffic flow can be represented in tabular format, and this can be seen in table 2.1 below.

Table 2.1 – March 2020 Morning Flow (08.00-09.30), Railway Street Junction

| From | To | | |
|-------|-------|-------|-------|
| | Arm A | Arm B | Arm C |
| Arm A | 0 | 18 | 314 |
| Arm B | 12 | 0 | 16 |
| Arm C | 69 | 10 | 0 |

2.3 Morning Peak levels

It was found during the morning traffic count that the A.M. Peak occurred between 08:30-9:30. The A.M. Peak level of traffic flow has been represented below in tabular format in Table 2.2 below.

Table 2.2 – March 2020 A.M. Peak (08.30-09.30), Railway Street Junction

| From | To | | |
|-------|-------|-------|-------|
| | Arm A | Arm B | Arm C |
| Arm A | 0 | 12 | 233 |
| Arm B | 8 | 0 | 13 |
| Arm C | 46 | 10 | 0 |

2.4 Evening Traffic levels

The March 2020 survey indicated that during the evening period a total of 254nr passenger car units travelled along the Railway Street towards Portlaoise Town Centre, with 118nr passenger car units travelling north-west towards Portlaoise Train Station. Of the 254nr passenger car units travelling towards Portlaoise Town Centre, 16nr passenger car units turned right towards Gymnasium, 238nr travelled straight through towards Odeon Cinema. Hence, of the 118nr passenger car units travelling towards the Train station, 23nr passenger car units turned right towards Gymnasium, 95nr travelled straight through the junction, 134 cars came out from the Gymnasium Road. These levels of traffic flow can be represented in tabular format, and this can be seen in table 2.3 below.

Table 2.3 – March 2020 Evening Flow (16.30-18.00), Railway Street Junction

| From | To | | |
|-------|-------|-------|-------|
| | Arm A | Arm B | Arm C |
| Arm A | 0 | 16 | 238 |
| Arm B | 33 | 0 | 101 |
| Arm C | 95 | 23 | 0 |

2.5 Evening Peak levels

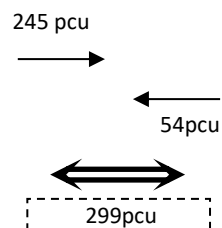
It was found during the evening traffic count that the P.M. Peak occurred between 16:45-17:45. The P.M. Peak level of traffic flow has been represented below in tabular format in Table 2.4 below.

Table 2.4 – March 2020 P.M. Peak (16.45-17.45), Railway Street Junction

| From | To | | |
|-------|-------|-------|-------|
| | Arm A | Arm B | Arm C |
| Arm A | 0 | 11 | 183 |
| Arm B | 21 | 0 | 74 |
| Arm C | 75 | 20 | 0 |

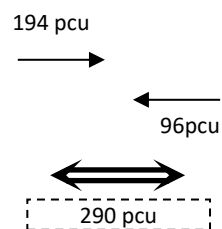
2.6 Arm A capacity

The survey indicated that, in the AM Peak, 54nr passenger car units travelled in a north-western direction along Railway Street from the surveyed junction towards Train Station, with 245nr passenger vehicles travelled south-east from Train Station towards the surveyed junction. These flows can be shown diagrammatically as follows:



Morning Peak Hour Flows (08.30 – 09.30)

The survey indicated that, in the PM Peak, 96nr passenger car units travelled in a north-western direction along Railway Street from the surveyed junction towards Train Station, with 194nr passenger vehicles travelled south-east from Train Station towards the surveyed junction. These flows can be shown diagrammatically as follows:



Evening Peak Hour Flows (16.45 – 17.45)

The maximum directional hourly flow along the Railway Street in the vicinity of the proposed development in the AM peak is estimated at 299 passenger car units per hour. The directional hourly flow for the PM peak was observed to be 290 vehicles per hour.

The advice note TA 79/99 'Traffic Capacity of Urban Roads' (DoT, 1999) gives the maximum hourly flow for an Urban All-purpose road Type 3 (UAP3), defined as a single carriageway road of variable

standard carrying mixed traffic with frontage access and side roads, bus stops and at-grade pedestrian crossings, as follows:

Table 2.5 – Capacity of UAP3 Roadway for Different Road Width

| | Width (m) | Capacity (veh/hr) |
|-------------|-----------|-------------------|
| UAP3 | 6.75 | 1110 |

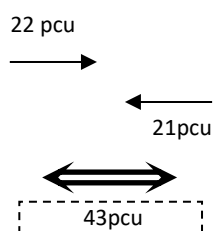
If one assumes that the Railway Street in the vicinity of the candidate site is 6.75 metres wide, its minimum capacity can be assumed to be 1110 vehicles per hour. Furthermore, the above UK capacity for such a road width assumes a HGV content of up to 15%.

The ratio of flow to capacity along Railway Street (Arm A) is estimated at 0.27 (27%) for the morning peak ($299 \div 1110$), with a value of 0.26 (26%) for the evening peak. These values indicate that traffic flows along the link are below the threshold at which capacity problems begin to become an issue.

2.7 Arm B capacity

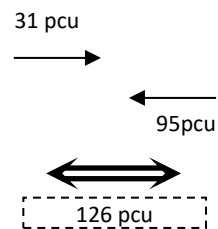
The survey indicated that, in the AM Peak, 22nr passenger car units travelled in a south-western direction from the surveyed junction towards Midlands Park Hotel Gymnasium, with 21nr passenger vehicles travelled north-east from Gymnasium towards the surveyed junction.

These flows can be shown diagrammatically as follows:



Morning Peak Hour Flows (08.30 – 09.30)

The survey indicated that, in the PM Peak, 31nr passenger car units travelled in a south-western direction from the surveyed junction towards Midlands Park Hotel Gymnasium, with 95nr passenger vehicles travelled north-east from Gymnasium towards the surveyed junction. These flows can be shown diagrammatically as follows:



Evening Peak Hour Flows (16.45 – 17.45)

The maximum directional hourly flow along the road to Gymnasium in the vicinity of the proposed development in the AM peak is estimated at 43 passenger car units per hour. The directional hourly flow for the PM peak was observed to be 126 vehicles per hour.

The advice note TA 79/99 'Traffic Capacity of Urban Roads' (DoT, 1999) gives the maximum hourly flow for an Urban All-purpose road Type 3 (UAP3), defined as a single carriageway road of variable standard carrying mixed traffic with frontage access and side roads, bus stops and at-grade pedestrian crossings, as follows:

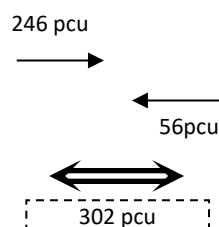
Table 2.6 – Capacity of UAP3 Roadway for Different Road Width

| | Width (m) | Capacity (veh/hr) |
|-------------|-----------|-------------------|
| UAP3 | 6.1 | 900 |

The ratio of flow to capacity along the road to Gymnasium (Arm B) is estimated at 0.05 (5%) for the morning peak ($43 \div 900$), with a value of 0.14 (14%) for the evening peak. These values indicate that traffic flows along the link are below the threshold at which capacity problems begin to become an issue.

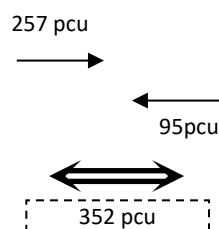
2.8 Arm C capacity

The survey indicated that, in the AM Peak, 246nr passenger car units travelled in a south-eastern direction along Railway Street from the surveyed junction towards Odeon Cinema, with 56nr passenger vehicles travelled north-west from Odeon Cinema towards the surveyed junction. These flows can be shown diagrammatically as follows:



Morning Peak Hour Flows (08.30 – 09.30)

The survey indicated that, in the PM Peak, 257nr passenger car units travelled in a south-eastern direction along Railway Street from the surveyed junction towards Odeon Cinema, with 95nr passenger vehicles travelled north-west from Odeon Cinema towards the surveyed junction. These flows can be shown diagrammatically as follows:



Evening Peak Hour Flows (16.45 – 17.45)

The maximum directional hourly flow along the Railway Street in the vicinity of the proposed development in the AM peak is estimated at 302 passenger car units per hour. The directional hourly flow for the PM peak was observed to be 352 vehicles per hour.

The ratio of flow to capacity along Railway Street (Arm A) is estimated at 0.27 (27%) for the morning peak ($302 \div 1110$), with a value of 0.32 (32%) for the evening peak. These values indicate that traffic flows along the link are below the threshold at which capacity problems begin to become an issue.

2.9 Future Transportation Plan for the Area

The current Portlaoise Local Area Plan and the Draft 2018-2024 LAP sets out the intention of Laois County Council to design and complete the Portlaoise Northern Orbital Route (PNOR). This route will skirt the northern edge of the proposed site. This route is proposed to consist of a 2-lane dual carriageway facility. The route will provide a link between the N80 at Clonreher and the R445 Dublin Road at Ballyclider and it will facilitate traffic movements that do not wish to travel through or near the town centre.

The timescale for the delivery of the completed PNOR is unknown at this stage, but when opened, it will attract the traffic from the other roads these are currently using the Railway Street to travel towards Portlaoise town centre, Mountmellick or M7 motorway. Therefore, on completion of the PNOR link, the traffic flows to Railway Street will decrease, which will aid in the operation levels of the proposed development.

3. TRAFFIC GENERATED BY THE PROPOSED DEVELOPMENT

3.1 General information

The proposed development consists of 68nr residential dwellings with 93 public car park spaces and associated roads, public open space and service infrastructure. Access to the site will be provided via a new connection to the existing link arm located to the north-east of Arm B.

The proposed approximate date of application for planning permission for this development is April 2020. It is anticipated that planning permission could be granted by July 2020. The application is intended to be a 10-year planning permission.

It is assumed then that works would commence on site in mid-2020. Working to an overall construction programme of 2 years yields a delivery of 50nr houses per year. Therefore, it has been determined that the day-of-opening assessment year for the Traffic Impact and Transport Assessment will be at 2022, with the future assessment year being set at 10 years from the commencement of works, set at 2032.

It is intended that the project will be delivered in discreet phases of dwellings, with typically 50nr dwellings being delivered per year. Applying this phasing to the traffic study, it is proposed that the day of opening assessment which will be made for the year 2022, will result in the delivery of the first 50nr dwellings. Therefore, the day of opening assessment will assess the impact of 50nr additional dwellings on the public road network.

Setting the final assessment year at 2032 yields an assessment year after the projected completion date of the project. Therefore, this assessment will be carried out assuming all 68nr dwellings are completed and occupied.

In addition, the traffic movements associated with it will be predominantly internal within the candidate site. Its effect on the local road network will thus be minimal.

3.2 Pedestrians/ Cyclists/ People with Disabilities

The existing road network has been designed to take account of all the road users, including all vulnerable users such as pedestrians, cyclists and people with disabilities. Cycle storage facilities are provided on site.

3.3 Additional Trips Generated by the Proposed Development

The projected traffic levels associated with the proposed development has been estimated using the TRICS database. The TRICS database for privately owned dwellings in an urban area typically yields a daily 2-way trip rate of 7.8 per unit and for town centre car parks typical trip generation rates are 6 vehicles per space in a 10-hour period. The following are the morning and evening peak rates.

AM Peak

0.46 Trips/Unit Outbound (for dwellings)

0.16 Trips/Unit Inbound (for dwellings)

0.6 Trips/Unit Outbound (for car parking spaces)

0.6 Trips/Unit Inbound (for car parking spaces)

PM Peak

0.42 Trips/Unit Inbound (for dwellings)

0.16 Trips/Unit Outbound (for dwellings)

0.6 Trips/Unit Outbound (for car parking spaces)

0.6 Trips/Unit Inbound (for car parking spaces)

In the design year (2022), all 68nr units and 93 car parking spaces will have been delivered, and therefore the total number of trips generated by the proposed development on the design year is as follows:

2022 AM Peak

0.46 x 68 = 31 Trips/Unit Outbound

0.6 x 93 = 56 Trips/Unit Outbound

0.16 x 68 = 11 Trips/Unit Inbound

0.6 x 93= 56 Trips/Unit Inbound

2022 PM Peak

0.42 x 68 = 29 Trips/Unit Inbound

0.6 x 93= 56 Trips/Unit Inbound

0.16 x 68 = 11 Trips/Unit Outbound

0.6 x 93= 56 Trips/Unit Outbound

3.4 Distribution of Trips Generated by Proposed Development

Of the traffic exiting the proposed development the current traffic allocation is presented in the Table 3.1.

Table 3.1-Current Traffic to Allocation at the Railway Street junction (2020)

| | AM PEAK, pcu | PM PEAK, pcu |
|--------------|--------------|--------------|
| <i>Arm A</i> | 299 | 290 |
| <i>Arm B</i> | 43 | 126 |
| <i>Arm C</i> | 302 | 352 |
| | AM PEAK, % | PM PEAK, % |
| <i>Arm A</i> | 46% | 38% |
| <i>Arm B</i> | 7% | 16% |
| <i>Arm C</i> | 47% | 46% |

These modal splits would also be assumed to be mirrored during the PM peak flows, with road users tending to use similar inwards and outwards route.

Therefore, when the additional traffic produced by the completed development is distributed as stated above, it yields the following distribution to the public road network, for 2022 assessment years respectively.

Table 3.2-Additional Traffic to Public Roads due to Completed Development (2022)

| | Outbound | | Inbound | |
|-------------------|--------------|--------------|--------------|--------------|
| | AM PEAK, pcu | PM PEAK, pcu | AM PEAK, pcu | PM PEAK, pcu |
| Railway Street NW | 40 | 32 | 31 | 25 |
| Road to Gymnasium | 6 | 14 | 4 | 11 |
| Railway Street SE | 41 | 39 | 31 | 31 |

4. TRAFFIC IMPACT

4.1 Projected 2022 Flow at Railway Street Junction (Without Development)

It is assumed that the proposed development will open in 2022. In order to increase the levels of traffic for a future date, the traffic levels from 2020 will be increased by 3% per year to allow for future development in the area contributing additional traffic to the road network.

It should be noted however, that it is unlikely that further development will occur within this area that would increase the traffic loading to the local road infrastructure. The area is bounded to the north-west by the railway tracks, and hence no future development can occur to this area, and all other locally zoned land will be required to be served by the future additional road development in Portlaoise. Notwithstanding this, a 3% yearly growth will be allowed for to provide a robust analysis on the road network capacity.

The 2022 flows through the Railway Street Junction for both the morning and evening peaks are derived by taking the surveyed 2020 flows and factoring them by 1.061 (2 years at 3% growth per year) as follows:

Table 4.1 - A.M. Peak, Railway Street Junction, 2022, Without Development

| From | To | | |
|-------|-------|-------|-------|
| | Arm A | Arm B | Arm C |
| Arm A | 0 | 13 | 247 |
| Arm B | 8 | 0 | 14 |
| Arm C | 49 | 11 | 0 |

Table 4.2-P.M. Peak, Railway Street Junction, 2022, Without Development

| From | To | | |
|-------|-------|-------|-------|
| | Arm A | Arm B | Arm C |
| Arm A | 0 | 12 | 194 |
| Arm B | 22 | 0 | 79 |
| Arm C | 80 | 21 | 0 |

4.2 Projected 2022 Flow at Railway Street Junction (With Development)

The post-development day-of-opening flows are obtained by combining the volumes shown immediately above in section 4.1 with the generated flows from the proposed development estimated in section 4.3 as follows:

Table 4.3 - A.M. Peak, Railway Street Junction, 2022, With Development

| From | To | | | |
|-------|-------|-------|-------|-------|
| | Arm A | Arm B | Arm C | Arm D |
| Arm A | 0 | 13 | 247 | 31 |
| Arm B | 8 | 0 | 14 | 4 |
| Arm C | 49 | 11 | 0 | 31 |
| Arm D | 40 | 6 | 41 | 0 |

Table 4.4 - P.M. Peak, Railway Street Junction, 2022, With Development

| From | To | | | |
|-------|-------|-------|-------|-------|
| | Arm A | Arm B | Arm C | Arm D |
| Arm A | 0 | 12 | 194 | 25 |
| Arm B | 22 | 0 | 79 | 11 |
| Arm C | 80 | 21 | 0 | 31 |
| Arm D | 32 | 14 | 39 | 0 |

4.3 Projected 2032 Flow at Railway Street Junction (With Development)

The 2032 flows through the Railway Street Junction for both the morning and evening peaks are derived by taking the projected 2022 flows presented in section 4.2 and factoring them by 1.344 (10 years at 3% growth per year) as follows:

Table 4.5 - A.M. Peak, Railway Street Junction, 2032, With Development

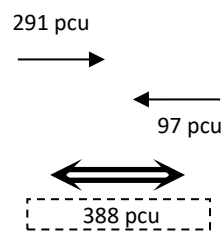
| From | To | | | |
|-------|-------|-------|-------|-------|
| | Arm A | Arm B | Arm C | Arm D |
| Arm A | 0 | 17 | 332 | 42 |
| Arm B | 11 | 0 | 19 | 6 |
| Arm C | 66 | 15 | 0 | 42 |
| Arm D | 54 | 8 | 55 | 0 |

Table 4.6 - P.M. Peak, Railway Street Junction, 2032, With Development

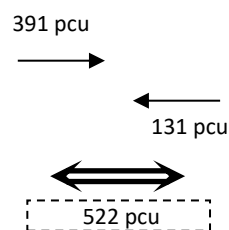
| From | To | | | |
|-------|-------|-------|-------|-------|
| | Arm A | Arm B | Arm C | Arm D |
| Arm A | 0 | 16 | 261 | 34 |
| Arm B | 30 | 0 | 106 | 15 |
| Arm C | 108 | 28 | 0 | 41 |
| Arm D | 43 | 19 | 52 | 0 |

4.4 Arm A capacity. Years 2022, 2032

Our research estimated that, in years 2022 and 2032, during the AM Peak, respectively, 97nr and 131nr passenger car units will be travelling in a north-western direction along Railway Street from the surveyed junction towards Train Station, with respectively 291nr and 391nr passenger vehicles will be travelling south-east from Train Station towards the surveyed junction. These flows can be shown diagrammatically as follows:

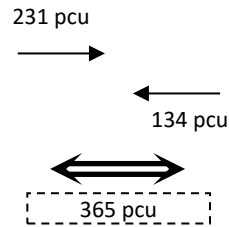


2022. Morning Peak Hour Flows (08.30 – 09.30)

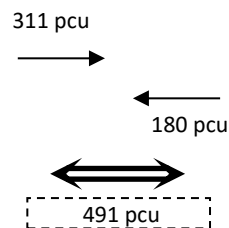


2032. Morning Peak Hour Flows (08.30 – 09.30)

Our research estimated that, in years 2022 and 2032, during the PM Peak, respectively, 134 and 180 passenger car units will be travelling in a north-western direction along Railway Street from the surveyed junction towards Train Station, with respectively 231 and 311 passenger vehicles will be travelling south-east from Train Station towards the surveyed junction. These flows can be shown diagrammatically as follows:



2022. Evening Peak Hour Flows (16.45 – 17.45)



2032. Evening Peak Hour Flows (16.45 – 17.45)

The maximum directional hourly flow along the Railway Street in the vicinity of the proposed development in the years 2022 and 2032 during the AM peak is estimated at 388 and 522 passenger car units per hour respectively. The directional hourly flow in the years 2022 and 2032 during the PM peak is estimated to be 365 and 491 vehicles per hour.

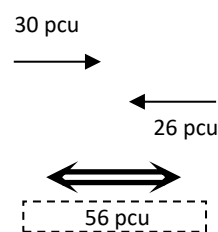
If we assume that the Railway Street in the vicinity of the candidate site will not change in 10 years and will be 6.75 metres wide, its minimum capacity can be assumed to be 1110 vehicles per hour, in accordance with TA 79/99 'Traffic Capacity of Urban Roads' (DoT, 1999). Furthermore, the above UK capacity for such a road width assumes a HGV content of up to 15%.

The ratio of flow to capacity along Railway Street (Arm A) in the years 2022 and 2032 is estimated respectively at 0.35 (35%) and 0.47 (47%) for the morning peak, with 0.33 (33%) and 0.44 (44%) respectively for the evening peak. These values indicate that traffic flows along the link are below the threshold at which capacity problems begin to become an issue.

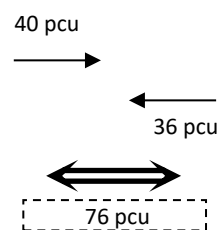
4.5 Arm B capacity

Our research estimated that, in the years 2022 and 2032 during the AM Peak, respectively 30nr and 40nr passenger car units will be travelling in a south-western direction from the surveyed junction towards Midlands Park Hotel Gymnasium, with respectively 26nr and 36nr passenger vehicles will be travelling north-east from Gymnasium towards the surveyed junction.

These flows can be shown diagrammatically as follows:



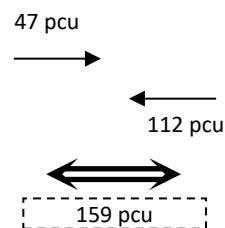
2022. Morning Peak Hour Flows (08.30 – 09.30)



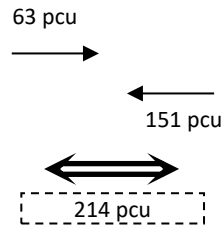
2032. Morning Peak Hour Flows (08.30 – 09.30)

Our research estimated that, in the years 2022 and 2032 during the PM Peak, respectively 47nr and 63nr passenger car units will be travelling in a south-western direction from the surveyed junction towards Midlands Park Hotel Gymnasium, with respectively 112nr and 151nr passenger vehicles will be travelling north-east from Gymnasium towards the surveyed junction.

These flows can be shown diagrammatically as follows:



2022. Evening Peak Hour Flows (16.45 – 17.45)



2032. Evening Peak Hour Flows (16.45 – 17.45)

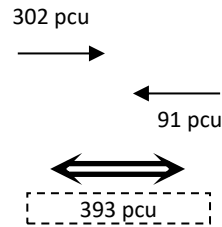
The maximum directional hourly flow along the Road to Gymnasium in the vicinity of the proposed development in the years 2022 and 2032 during the AM peak is estimated respectively at 56 and 76 passenger car units per hour. The directional hourly flow for the PM peak will be respectively 159 and 214 vehicles per hour.

If we assume that the Railway Street in the vicinity of the candidate site will not change in 10 years and will be 6.1 metres wide, its minimum capacity can be assumed to be 900 vehicles per hour, in accordance with TA 79/99 'Traffic Capacity of Urban Roads' (DoT, 1999).

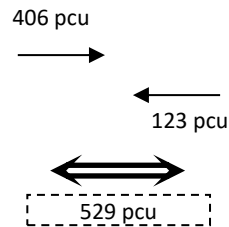
The ratio of flow to capacity along the road to Gymnasium (Arm B) for the years 2022 and 2032 is estimated respectively at 0.06 (6%) and 0.08 (8%) for the morning peak, with respectively 0.18 (18%) and 0.24 (24%) for the evening peak. These values indicate that traffic flows along the link are below the threshold at which capacity problems begin to become an issue.

4.6 Arm C capacity

Our research estimated that, in the years 2022 and 2032 during the AM Peak, respectively, 302 and 406 passenger car units travelled in a south-eastern direction along Railway Street from the surveyed junction towards Odeon Cinema, with respectively 91 and 123 passenger vehicles travelled north-west from Odeon Cinema towards the surveyed junction. These flows can be shown diagrammatically as follows:

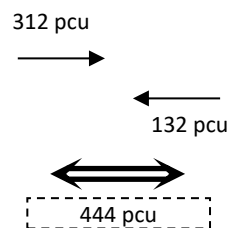


2022. Morning Peak Hour Flows (08.30 – 09.30)

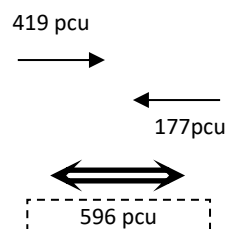


2032. Morning Peak Hour Flows (08.30 – 09.30)

Our research estimated that, in the years 2022 and 2032 during the PM Peak, respectively, 312 and 419 passenger car units travelled in a south-eastern direction along Railway Street from the surveyed junction towards Odeon Cinema, with respectively 132 and 177 passenger vehicles travelled north-west from Odeon Cinema towards the surveyed junction. These flows can be shown diagrammatically as follows:



2022. Evening Peak Hour Flows (16.45 – 17.45)



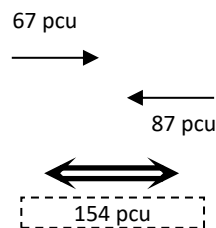
2032. Evening Peak Hour Flows (16.45 – 17.45)

The maximum directional hourly flow along the Railway Street in the vicinity of the proposed development in the years 2022, 2032 during the AM peak is estimated respectively at 393 and 529 passenger car units per hour. The directional hourly flow in the years 2022, 2032 for the PM peak is estimated to be respectively 444 and 596 vehicles per hour.

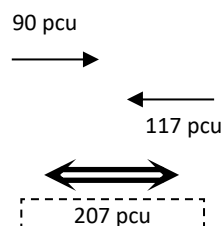
The ratio of flow to capacity along Railway Street (Arm C) for the years 2022 and 2032 is estimated respectively at 0.35 (35%) and 0.48 (48%) for the morning peak, with respectively 0.40 (40%) and 0.54 (54%) for the evening peak. These values indicate that traffic flows along the link are below the threshold at which capacity problems begin to become an issue.

4.7 Arm D capacity

Our research estimated that, in the years 2022 and 2032 during the AM Peak, respectively 67 and 90 passenger car units will be travelling in a north-eastern direction from the surveyed junction towards Proposed Development, with respectively 87 and 117 passenger vehicles will be travelling south-west from Proposed Development towards the surveyed junction. These flows can be shown diagrammatically as follows:

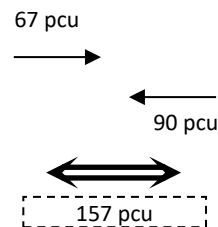


2022. Morning Peak Hour Flows (08.30 – 09.30)

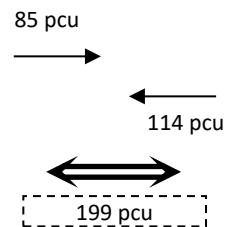


2032. Morning Peak Hour Flows (08.30 – 09.30)

Our research estimated that, in the years 2022 and 2032 during the PM Peak, respectively 67 and 90 passenger car units will be travelling in a north-eastern direction from the surveyed junction towards Proposed Development with respectively 85 and 114 passenger vehicles will be travelling south-west from Proposed Development towards the surveyed junction. These flows can be shown diagrammatically as follows:



2022. Evening Peak Hour Flows (16.45 – 17.45)



2032. Evening Peak Hour Flows (16.45 – 17.45)

The maximum directional hourly flow along the Road to Proposed Development in the vicinity of the proposed development in the years 2022 and 2032 during the AM peak is estimated respectively at 154 and 207 passenger car units per hour. The directional hourly flow for the PM peak will be respectively 157 and 199 vehicles per hour.

If we assume that the entrance road to the Proposed Development will be 6.1 metres wide, its minimum capacity can be assumed to be 900 vehicles per hour, in accordance with TA 79/99 'Traffic Capacity of Urban Roads' (DoT, 1999).

The ratio of flow to capacity along the road to Proposed Development (Arm D) for the years 2022 and 2032 is estimated respectively at 0.17 (17%) and 0.23 (23%) for the morning peak, with

respectively 0.17 (17%) and 0.22 (22%) for the evening peak. These values indicate that traffic flows along the link are below the threshold at which capacity problems begin to become an issue.

4.8 Summary

Our research indicates that in the years 2022 and 2032, traffic flows around surveyed junction will stay below the threshold level at which capacity problems begin to become an issue. These values are presented in the Tables 4.7 and 4.8.

Table 4.7 – The estimated Ratio of Flow Capacity, Railway Street Junction, 2022, With Development

| | AM PEAK | PM PEAK |
|--------------|---------|---------|
| Arm A | 35% | 33% |
| Arm B | 6% | 18% |
| Arm C | 35% | 40% |
| Arm D | 17% | 17% |

Table 4.8 – The estimated Ratio of Flow Capacity, Railway Street Junction, 2032, With Development

| | AM PEAK | PM PEAK |
|--------------|---------|---------|
| Arm A | 47% | 44% |
| Arm B | 8% | 24% |
| Arm C | 48% | 54% |
| Arm D | 23% | 22% |

5. PICADY ANALYSIS

In accordance with our methodology, we have followed the IHT *Guidelines for TIA*, and the NRAs Traffic and Transportation Assessment Guidelines (May 2014), in the assessment of the traffic impact resulting from the proposed development.

We have undertaken an access junction assessment during the year of opening (2022) and during the design year 10 years after opening (2032). For simple comparative purposes, the results for year of opening and design years of 2022 and 2032 are summarised below as Table 5.1.

JRA Consulting Engineers have assessed the site access junction using the T.I.I approved PICADY (Priority Intersection Capacity And Delay) software package. PICADY produces results based on a ratio of flow to capacity (RFC) and queue length. An RFC greater than 1.00 indicates that a junction is operating at or above capacity, with 0.85 considered to be the optimum RFC value.

Therefore, for the purposes of this analysis, the road widths for the major and minor roads have been assessed using the minimum dimensions as acceptable to the PICADY design software, i.e. the Railway Street has been modelled at 6.75m wide and the Roads to the Gymnasium and to the Proposed Development have been modelled at being 6.1m in width.

We have appended the detailed JRA computer simulation model results (PICADY Outputs) of the junction modelling in **Appendix C**. A summary of the results is reproduced below as **Table 5.1** and **Table 5.2**.

Table 5.1 - Proposed Priority Access Junction – Summary PICADY Results (without development)

| | AM | | | | | | | | PM | | | | | | | | |
|-------------|--------------------------|-----------------|-----------|------|-----|--------------------|--------------|---------------------------|-------------|-----------------|-----------|------|------|--------------------|--------------|---------------------------|-------|
| | Queue (PCU) | 95% Queue (PCU) | Delay (s) | RFC | LOS | Junction Delay (s) | Junction LOS | Network Residual Capacity | Queue (PCU) | 95% Queue (PCU) | Delay (s) | RFC | LOS | Junction Delay (s) | Junction LOS | Network Residual Capacity | |
| | 2020 | | | | | | | | | | | | | | | | |
| Stream B-C | 0.0 | ~1 | 5.59 | 0.00 | A | 0.51 | A | 900 % | 0.0 | ~1 | 5.69 | 0.03 | A | 2.21 | A | 900 % | |
| Stream B-A | 0.0 | ~1 | 7.12 | 0.00 | A | | | 0.0 | ~1 | 7.17 | 0.02 | A | 2.21 | | | A | 900 % |
| Stream C-AB | 0.0 | ~1 | 6.04 | 0.01 | A | | | 0.0 | ~1 | 6.02 | 0.01 | A | | | | | |
| | 2022 Without Development | | | | | | | | | | | | | | | | |
| Stream B-C | 0.0 | ~1 | 5.59 | 0.00 | A | 0.37 | A | 900 % | 0.0 | ~1 | 5.71 | 0.03 | A | 2.21 | A | 900 % | |
| Stream B-A | 0.0 | ~1 | 7.12 | 0.00 | A | | | 0.0 | ~1 | 7.18 | 0.02 | A | 2.21 | | | A | 900 % |
| Stream C-AB | 0.0 | ~1 | 0.00 | 0.00 | A | | | 0.0 | ~1 | 6.02 | 0.01 | A | | | | | |
| | 2032 Without Development | | | | | | | | | | | | | | | | |
| Stream B-C | 0.0 | ~1 | 5.64 | 0.00 | A | 0.51 | A | 900 % | 0.0 | ~1 | 5.78 | 0.04 | A | 2.24 | A | 900 % | |
| Stream B-A | 0.0 | ~1 | 7.20 | 0.01 | A | | | 0.0 | ~1 | 7.26 | 0.03 | A | 2.24 | | | A | 900 % |
| Stream C-AB | 0.0 | ~1 | 6.07 | 0.01 | A | | | 0.0 | ~1 | 6.04 | 0.01 | A | | | | | |

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Arm A is the Railway Street (North-West Side)

Arm B is the Road to Gymnasium of Midlands Park Hotel

Arm C is the Railway Street (South-East Side)

Arm D is the Road to Proposed Development

Table 5.2 - Proposed Priority Access Junction – Summary PICADY Results (with development)

| | AM | | | | | | | | PM | | | | | | | |
|--------------|-------------|-----------------|-----------|------|-----|--------------------|--------------|---------------------------|-------------|-----------------|-----------|------|-----|--------------------|--------------|---------------------------|
| | Queue (PCU) | 95% Queue (PCU) | Delay (s) | RFC | LOS | Junction Delay (s) | Junction LOS | Network Residual Capacity | Queue (PCU) | 95% Queue (PCU) | Delay (s) | RFC | LOS | Junction Delay (s) | Junction LOS | Network Residual Capacity |
| | 2022 | | | | | | | | | | | | | | | |
| Stream B-CD | 0.0 | ~1 | 6.57 | 0.03 | A | 2.34 | A | 280 % [Stream D-BC] | 0.2 | ~1 | 7.23 | 0.15 | A | 3.36 | A | 232 % [Stream D-BC] |
| Stream B-AD | 0.0 | ~1 | 8.59 | 0.02 | A | | | | 0.1 | ~1 | 8.82 | 0.06 | A | | | |
| Stream A-BCD | 0.1 | ~1 | 5.08 | 0.06 | A | | | | 0.1 | ~1 | 5.32 | 0.05 | A | | | |
| Stream D-AB | 0.1 | ~1 | 6.41 | 0.07 | A | | | | 0.1 | ~1 | 6.75 | 0.07 | A | | | |
| Stream D-BC | 0.1 | ~1 | 8.85 | 0.10 | A | | | | 0.1 | ~1 | 9.22 | 0.10 | A | | | |
| Stream C-ABD | 0.0 | ~1 | 6.17 | 0.02 | A | | | | 0.1 | ~1 | 6.00 | 0.04 | A | | | |
| | 2032 | | | | | | | | | | | | | | | |
| Stream B-CD | 0.0 | ~1 | 6.95 | 0.04 | A | 2.54 | A | 183 % [Stream D-BC] | 0.3 | ~1 | 8.05 | 0.20 | A | 3.70 | A | 147 % [Stream D-BC] |
| Stream B-AD | 0.0 | ~1 | 9.36 | 0.03 | A | | | | 0.1 | ~1 | 9.72 | 0.09 | A | | | |
| Stream A-BCD | 0.2 | ~1 | 4.89 | 0.09 | A | | | | 0.1 | ~1 | 5.16 | 0.07 | A | | | |
| Stream D-AB | 0.1 | ~1 | 6.76 | 0.10 | A | | | | 0.1 | ~1 | 7.21 | 0.10 | A | | | |
| Stream D-BC | 0.2 | ~1 | 9.78 | 0.14 | A | | | | 0.2 | ~1 | 10.39 | 0.15 | B | | | |
| Stream C-ABD | 0.0 | ~1 | 6.24 | 0.03 | A | | | | 0.1 | ~1 | 6.02 | 0.06 | A | | | |

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Arm A is the Railway Street (North-West Side)

Arm B is the Road to Gymnasium of Midlands Park Hotel

Arm C is the Railway Street (South-East Side)

Arm D is the Road to Proposed Development

The results of the modelling clearly show that the proposed junction will have more than adequate capacity to accommodate the traffic associated with the Proposed Development at the Railway Street. All the RFCs are below the theoretical capacity of 0.85, and relatively minimal queuing is anticipated.

The design calculations carried out on PICADY's minimum road widths indicate that there will be a minimum spare Network Residual Capacity of up to 160% for vehicles in the future design year 2032. The junction will have adequate capacity to cater for the additional traffic flows as resulting from the Proposed Development. The most significant design requirement will be the safe use of the access roads. It is proposed that the low level of traffic associated with the Proposed Development will result in no decrease in the current safe use of the existing road network.

6. CONCLUSION

This Transportation Assessment assesses the traffic impact associated with the proposal to provide an extension to the Proposed Development at the Railway Street, Portlaoise, County Laois.

This Report has been prepared in accordance with the Institution of Highways and Transportation *"Guidelines for Traffic Impact Assessment"*, and it provides an onerous and robust assessment of the capacity and design of the proposed access.

This report demonstrates that the existing and proposed access junctions at the Railway Street will provide more than adequate capacity to cater for the maximum worst case traffic demands, in a safe and appropriate manner.

This is confirmed through the detailed analysis contained within this report which demonstrates, based on March 2020 traffic survey data, that there are no capacity or queuing problems whatsoever at the site access during both the year of opening and the design years (2022 and 2032).

It is also proposed that the low level of additional traffic as associated with the Proposed Development will have little impact on the safe operation of the existing road network in the vicinity of the pit.

It is considered that there are no significant Traffic and Road issues that prevent a positive determination of the application by the Local Authority.

7. REFERENCES

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Department of Transport (1985) *Traffic flows and carriageway width assessment*, Departmental Standard TD 20/85, HMSO, London, United Kingdom.

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Kimber, R.M. and Hollis, E.M (1979) *Traffic queues and delays at road junctions*. TRRL Report LR909. Transport and Road Research Laboratory, Crowthorne, United Kingdom.

Kimber, R.M. (1980) *The Traffic Capacity of Roundabouts*. Transport and Road Research Laboratory Report LR942, Crowthorne.

Kimber, R.M. and Coombe, R.D. (1980) *The Traffic capacity of Major/Minor Priority Junctions*. TRRL Supplementary Report 582, Transport and Road Research Laboratory, Crowthorne, UK.

Design Manual for Urban Roads and Streets (2013) Dept of Environment, Community and Local Government

Appendix A

Proposed Access Layout Drawing



Proposed site access layout. (Google Earth, 2020)

Appendix B

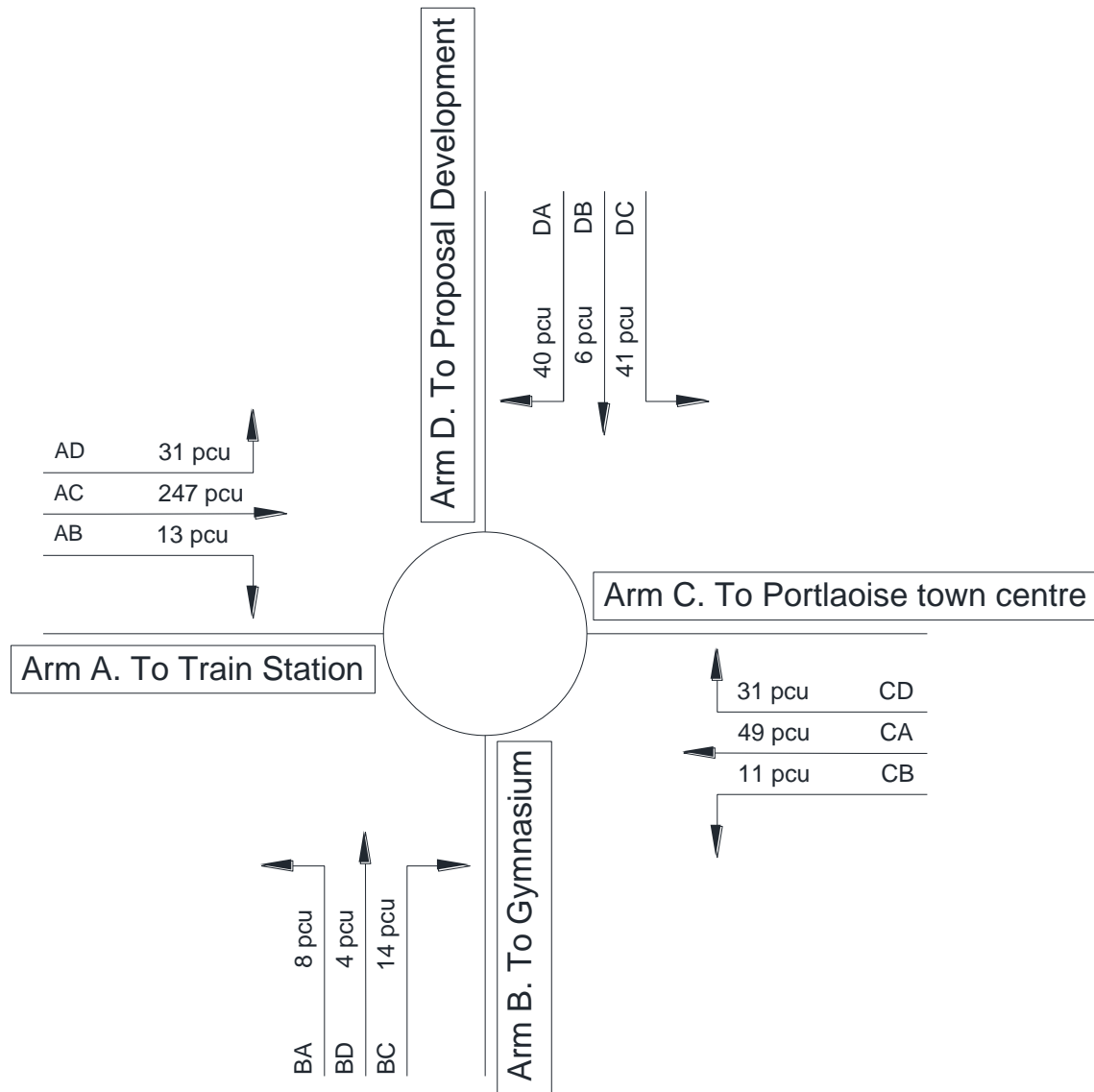
Traffic Survey Data

| Time Period | Railway Street: Toward Train Station | | | Railway street: Toward Odeon Cinema | | | In Gymnasium from Train station | | | In Gymnasium from Odeon Cinema | | | From Gymnasium to Train station | | | From Gymnasium to Odeon Cinema | | |
|-------------|--|-------|-------|---|-------|-------|------------------------------------|-------|-------|-----------------------------------|-------|-------|------------------------------------|-------|-------|-----------------------------------|-------|-------|
| | Cars | Buses | HGV's | Cars | Buses | HGV's | Cars | Buses | HGV's | Cars | Buses | HGV's | Cars | Buses | HGV's | Cars | Buses | HGV's |
| 08:00-08:15 | 11 | | | 37 | | | 3 | | | | | | 2 | | | 1 | | |
| 08:15-08:30 | 12 | | | 44 | | | 3 | | | | | | 2 | | | 2 | | |
| 08:30-08:45 | 13 | 1 | | 58 | | | 4 | | | 1 | | | 1 | | | 3 | | |
| 08:45-09:00 | 15 | | | 64 | 2 | 1 | 4 | | | 5 | | | 2 | | | 6 | | |
| 09:00-09:15 | 9 | | | 48 | 3 | | 2 | | | 1 | | | 2 | | | 2 | | |
| 09:15-09:30 | 7 | | | 45 | 2 | 1 | 2 | | | 3 | | | 3 | | | 2 | | |
| | | | | | | | | | | | | | | | | | | |
| 16:30-16:45 | 10 | | | 24 | | | 2 | | | | | | 9 | | | 9 | | |
| 16:45-17:00 | 17 | | | 47 | 1 | 1 | 2 | | | 1 | | | 11 | | | 19 | | |
| 17:00-17:15 | 27 | | | 50 | | 1 | 3 | | | 9 | | | 2 | | | 25 | | |
| 17:15-17:30 | 14 | | | 49 | | | 2 | | | 5 | | 1 | 5 | | | 16 | | |
| 17:30-17:45 | 17 | | | 31 | | | 4 | | | 3 | | | 3 | | | 14 | | |
| 17:45-18:00 | 10 | | | 29 | | 1 | 3 | | | 3 | | | 3 | | | 18 | | |

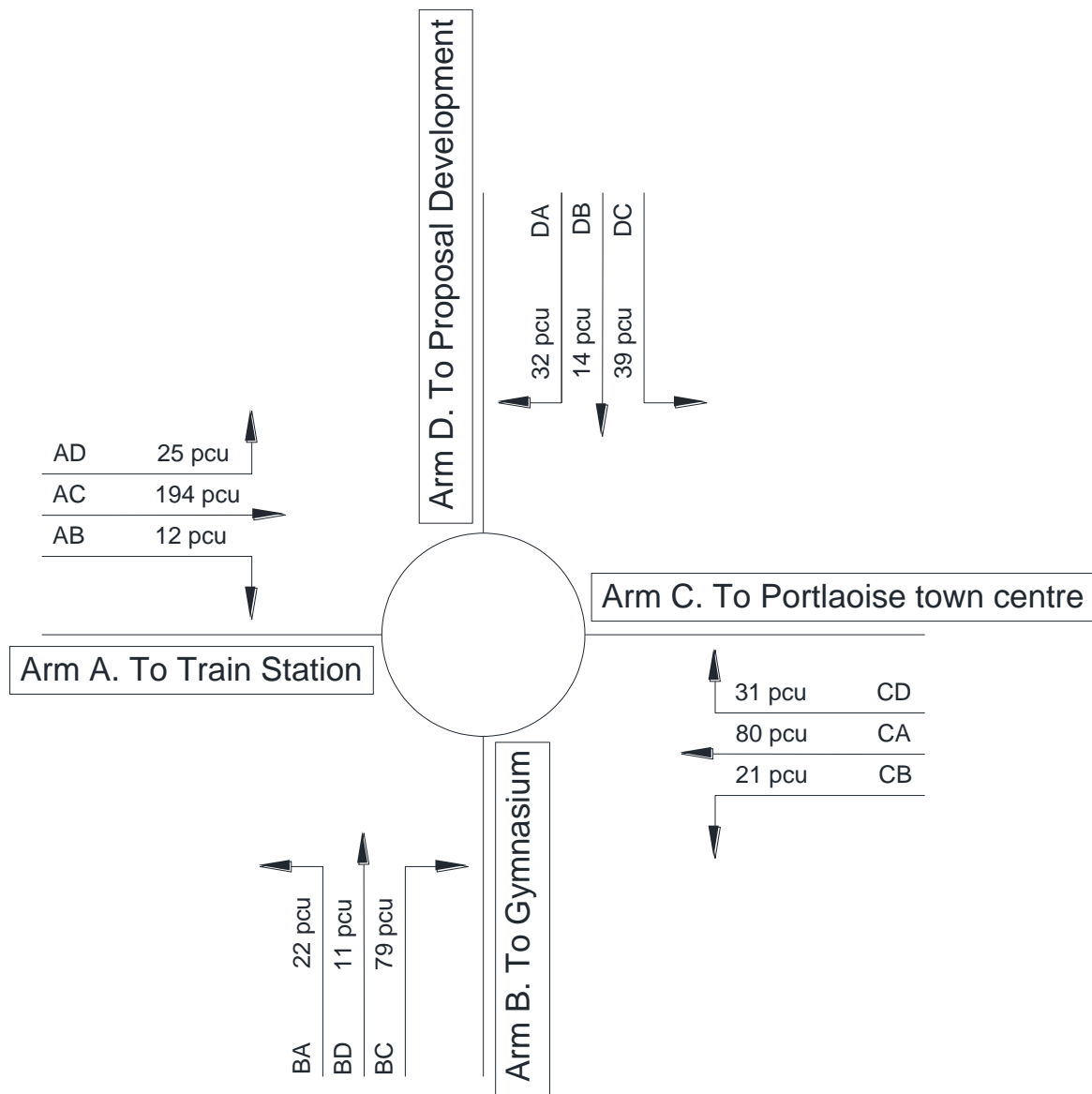
Appendix C

Diagrams

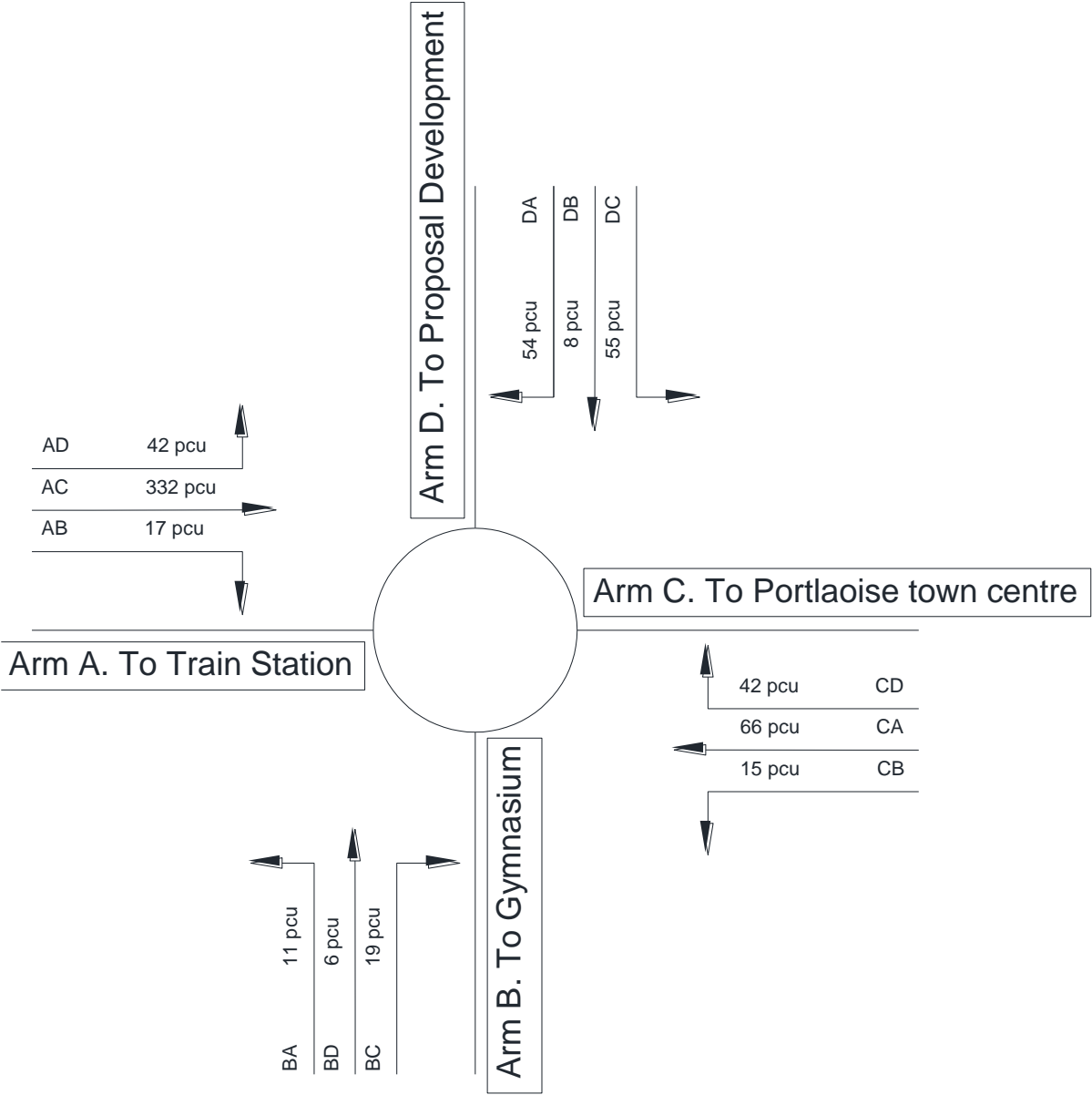
2022 AM PEAK. WITH DEVELOPMENT



2022 PM PEAK. WITH DEVELOPMENT



2032 AM PEAK. WITH DEVELOPMENT



2032 PM PEAK. WITH DEVELOPMENT

