Malachy Walsh and Partners
Engineering and Environmental Consultants
Cork | Tralee | Limerick | London

Mayo County Council

Proposed Housing Development at Golf Course Road, Westport, County Mayo

Traffic Impact Assessment

Project No.: 21583
Document No.: 6003/Rev.A
Date: August 2020

Mayo County Council

Proposed Housing Development at Golf Course Road, Westport, County Mayo

Traffic Impact Assessment

Project No.	Doc. No.	Rev.	Date	Prepared By	Checked By	Approved By	Status
21583	6003	A	06.08.2020	S Quigley	S Quigley	P O'Donnell	Planning

Malachy Walsh and Partners, Engineering and Environmental Consultants

Address: Park House, Mahon Technology Park, Bessboro Road, Blackrock, Cork

Malachy Walsh and Partners
Engineering and Environmental Consultants

CONTENTS

Appendices

1.0 INTRODUCTION

1.1 This Traffic Impact Assessment has been prepared on behalf of Mayo County Council for their proposed 50 housing units development at Golf Course Road, Westport, County Mayo.

1.2 This Traffic Impact Assessment is required by Mayo County Council for the purposes of a Part 8 planning process.

2.0 METHODOLOGY

2.1 This Traffic and Transport Assessment has been prepared in the context of the following:

- Mayo County Council's Mayo County Development Plan 2014-2020;
- Mayo County Council's Westport Town and Environs Development Plan 2010-2016, as varied;
- The Transport Infrastructure Ireland (TII) Traffic and Transport Assessment Guidelines PE-PDV-02045 May 2014;
- TII's Project Appraisal Guidelines for National Roads Unit 5.3 Travel Demand Projections PE-PAG-02017 October 2016;
- UK Traffic Capacity of Urban Roads TA 79/99;
- The Chartered Institution of Highways and Transportation (CIHT) Trip Rate Information Computer System (TRICS);
- The Department of Transport and Department of Environment Design Manual for Urban Roads and Streets (DMURS) May 2019 (Version 1.1); and
- The Environmental Protection Agency (EPA) Guidelines On The Information To Be Contained In Environmental Impact Assessment Reports Draft August 2017 (EPA EIAR Guidelines).

2.2 Existing baseline traffic volumes on the local road network have been established on the basis of on-site traffic counts and TII automatic traffic counter data.

3.0 FORECASTING METHODS

3.1 The existing L1802 Golf Course Road/N59 Newport Road junction has been analysed using the computer software programme, PICADY, for priority controlled junctions.

3.2 PICADY (Priority Intersection CApacity and DelaY) is a computer programme for calculating estimates of the capacity of major/minor road junctions, where the minor road is controlled by a stop or yield sign. The geometric details of the junction are supplied to the programme, together with details of traffic flows and turning movements. The programme analyses the junction in relation to the various traffic flows and calculates the capacity of each approach. The programme also calculates the average queue length on each approach and the average delay per vehicle. The average queue length may be displayed in graphical form.

3.3 PICADY is issued by the UK company, TRL (formerly the Transport Research Laboratory).

4.0 DESCRIPTION OF DEVELOPMENT

4.1 The proposed housing development site is located on the south side of Golf Course Road, Westport, on the north west side of the town centre, as shown on Figure 1. The local access road to the Westport House caravan and camping park and Westport United Football Club is located on the south side of the site.

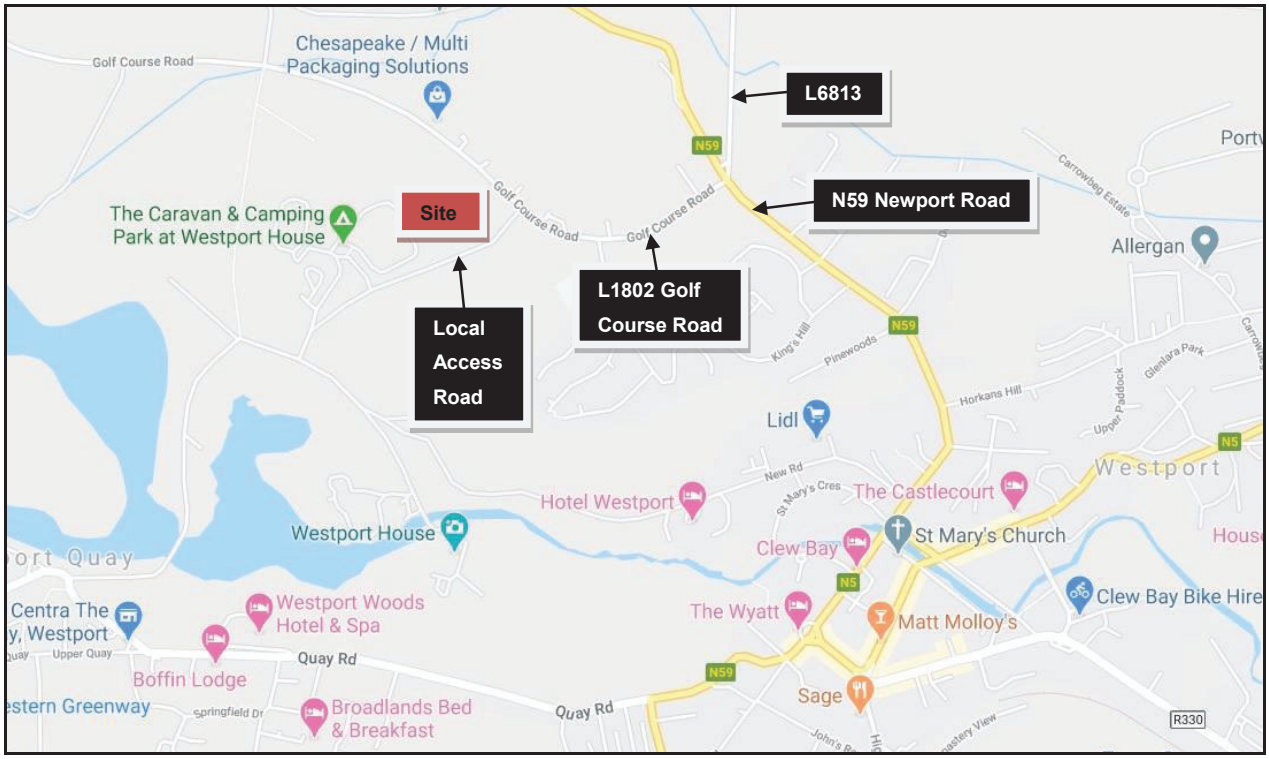
4.2 The existing site is a green field site with a field access gate on its south east side on the local access road.

4.3 The proposed housing development includes 50 mixed-size units including 12 two-bedroom units and 38 three-bedroom units.

4.4 Access for the proposed housing development is proposed via two accesses on Golf Course Road and one access on the local access road, south west of the location of the existing site access gate. Separate pedestrian accesses are also proposed on Golf Course Road, at the east end of the site and between the two vehicle accesses.

4.5 Subject to planning permission, it is envisaged for this Assessment that the proposed 50 units' housing development would be fully complete by 2022.

Figure 1: Site Location Map



5.0 EXISTING CONDITIONS

Road Network

5.1 The proposed housing development site is located on the south side of Golf Course Road, on the north west side of the town centre, as shown on Figure 1. Golf Course Road has a priority Stop T-junction on it south west side with the local access road to the Westport House caravan and camping park and Westport United Football Club, on the east side of the site boundary.

5.2 The local access road has a typical road carriageway width of 6.0 metres and a 2.0 metres wide on-carriageway south east side cycle lane with segregating flexible bollards, which links with an off-carriageway cycle facility, locally, on the south west side of Golf Course Road. The local access road has a 2.1 metres wide footway and street lighting standards along its south west side. A kerbed variable width grass verge is provided along the north west (site) side of the local access road. The verge width is circa 3.1 metres at the location of the proposed site access on the local access road.

5.3 Golf Course Road has a typical two-way urban road carriageway width of 7.0 metres in the vicinity of the site, with footways on both sides on the east side of its local access road junction. Street lighting standards are provided along the south west (site) side of Golf Course Road in the vicinity of the site. A circa 2.4 metres wide footway is provided along the north side of Golf Course Road, west of its local access road junction, with local footway widening.

5.4 Road drainage gullies are provided on both sides of Golf Course Road and on the local access road, adjacent to the proposed site.

5.5 A kerbed grass verge is provided along the south west (site) side of Golf Course Road, with variable widths from circa 1.8 metres to circa 4.5 metres at its north west end.

5.6 Traffic calming centrally located road narrowing and speed cushion measures, with alternating Yield one-way traffic, are provided on Golf Course Road, immediately east of its local access road junction and approximately 140 metres on the north west side of the junction. A raised pedestrian crossing facility is provided on Golf Course Road, approximately 100 metres south east of its local access road junction.

5.7 Golf Course Road is part of the L1802 Local Road and forms a priority Stop junction with Newport Road, approximately 450 metres east of the proposed site. The L6813 Local Road is located on the east side of Newport Road, opposite its Golf Course Road junction.

5.8 Between the proposed site and its Newport Road junction, Golf Course Road has multiple accesses for existing residential developments and dwellings. The Bog Field park and playground is located on the south west side of Golf Course Road, on the opposite side of its local access road junction to the proposed site. Two direct pedestrian accesses to The Bog Filed are provided on Golf Course Road, with a third access and adjacent vehicle set down facility provided at the Fairways on its east side. The Bog Field also links with Gaelscoil na Gruaiche on its south side.

5.9 Newport Road is part of the N59 National Secondary Road and extends south east to Westport town centre. An off-carriageway shared pedestrian/cycle facility is provided along the south west side of Newport Road from its Golf Course Road junction towards the town centre. A Toucan controlled crossing is provided on Newport Road, immediately south east of its Golf Course Road junction, which links with the off-carriageway shared pedestrian/cycle facility. Street lighting standards are provided along the south west side of Newport Road.

5.10 Newport Road has a typical urban road carriageway width of 6.6 metres in the vicinity of its Golf Course Road junction. A footway is also provided along the north east side of Newport Road from its L6813 junction towards the town centre. The L6813 has a road carriageway width of circa 3.7 metres, which is restrictive for two-way vehicle traffic. The L6813 provides a link to the Great Western Greenway, located approximately 500 metres north of its Newport Road junction.

5.11 The existing local road network in the vicinity of the proposed site is located within the Westport 50 km/hour urban speed limit zone. The Golf Course Road/Newport Road junction is located within the Westport 60 km/hour suburban speed limit zone.

5.12 Westport is served by Íarnród Éireann's Westport Train Station services and by Bus Éireann's public transport services.

5.13 The local access road adjacent to the proposed site links to the south west part of Westport at the Quay, via Westport House and Demesne.

5.14 The N59 links with the N5 National Primary Road in Westport town centre.

Existing Traffic Volumes

5.15 A review of the latest full year, 2019, continuous automatic traffic counter data, provided by TII on their website, for the N59 and N5 national roads, in the vicinity of Westport, indicates that daily volumes are higher during the July and August summer/tourist holiday period, than when schools are open. The data includes the following:

- TII counter 20591 – N59 between Mullranny and Newport; and
- TII counter 1051 – N5 between Westport and Castlebar.

5.16 The TII data indicates that the weekday evening peak hour is the typical daily peak hour. An August weekday evening peak hour traffic count survey was carried out by Malachy Walsh and Partners on the 4th August 2020 at the existing Golf Course Road/Newport Road junction. No vehicles were recorded using the restrictive width L6813 Local Road via its Newport Road/Golf Course Road junction. Cyclists were recorded using the L6813 for access to/from the Great Western Greenway. All recorded cyclists accessed the L6813 via the Toucan crossing located south east of the Newport Road/Golf Course Road junction, and none were recorded using the road junction.

5.17 As the survey and this Assessment was undertaken during the Government's Coronavirus (Covid-19) restrictions and measures, the recorded traffic volumes were factored to typical August 2019 levels using the TII data, to provide robust baseline traffic data for this Assessment.

5.18 The 2019 August summer peak season peak hour traffic volumes at the Golf Course Road/Newport Road junction are provided in Table 1.

Table 1: 2019 Traffic Volumes

Junction	Approach	Movement	PM Peak Hour Total Vehicles (Heavy Vehicles)
Golf Course Road/Newport Road	Newport Road North Westbound	Left	96 (1)
		Straight	226 (4)
	Golf Course Road	Left	10
		Right	67
	Newport Road South Eastbound	Right	11
		Straight	221 (8)

Urban Road Link Capacities

5.19 On the basis of the UK Traffic Capacity of Urban Roads TA79/99, the Golf Course Road and Newport Road urban and suburban, respectively, road capacities are provided in Table 2. The urban and suburban road link capacities are per each direction per hour.

Table 2: Existing Road Urban Road Link Capacities in Each Direction

Road	Urban Road Link		
	Type	Lanes	Capacity/Hour/Direction (Vehicles)
Golf Course Road	UAP4	2	900
Newport Road	UAP2	2	1,020

5.20 The 2019 urban and suburban road link peak hour volume/capacity ratios for Golf Course Road and Newport Road, respectively, are provided in Table 3, on the basis of the UK Traffic Capacity of Urban Roads TA 79/99.

Table 3: Urban and Suburban Road Link 2019 Peak Hour Volume/Capacity Ratios

Road	Direction	Peak Hour Vehicles/ Highest Direction	Capacity/Hour/ Direction (Vehicles)	Volume/ Capacity Ratio
Golf Course Road	South Westbound	107	900	12%
	North Eastbound	77		9%
Newport Road	North Westbound	322	1,020	32%
	South Eastbound	288		28%

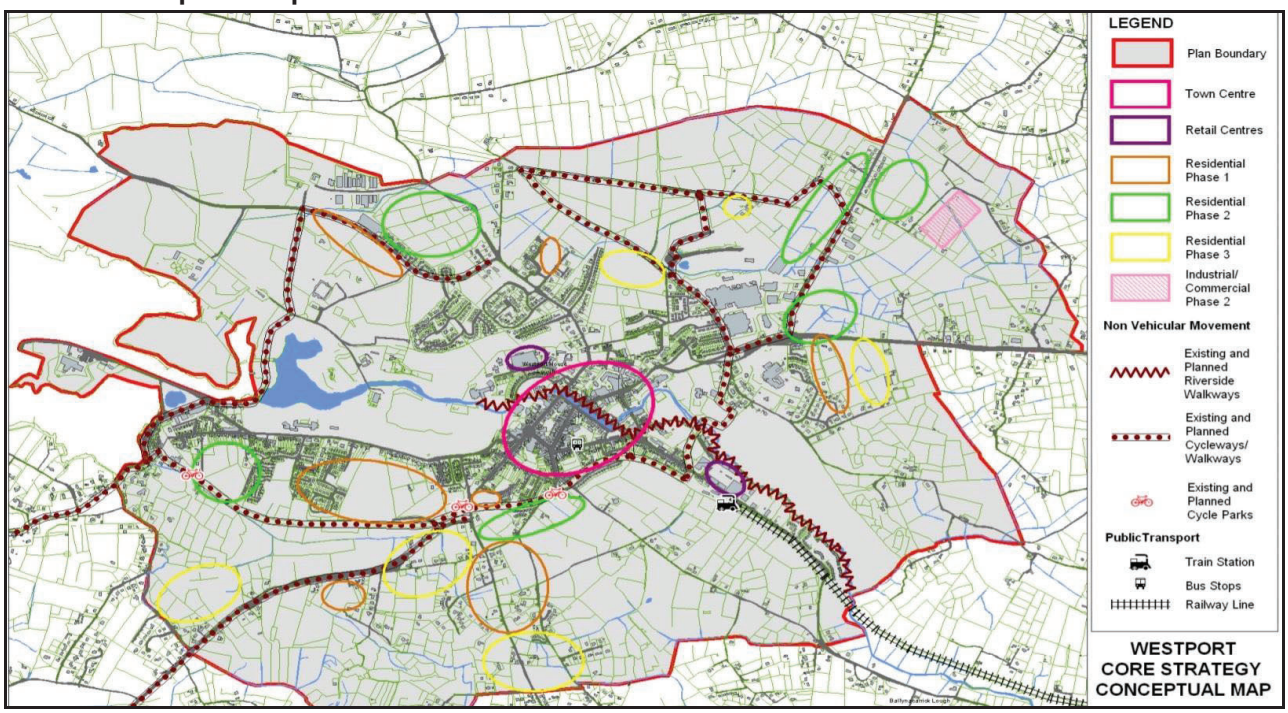
5.21 Golf Course Road and Newport Road are operating well within their urban and suburban, respectively, road link capacities, for the 2019 peak hour traffic volumes, with highest road link volume/capacity ratios of up to 12% and 32%, respectively.

6.0 FUTURE CONDITIONS

6.1 Mayo County Council's policies and objectives for Westport are detailed in their Mayo County Development Plan 2014-2020 and Westport Town and Environs Development Plan 2010-2016, as varied.

6.2 The Westport Core Strategy Conceptual Map is shown in Figure 2. The Plan includes cycleway/walkway facilities along Golf Course Road.

Figure 2: Westport Town and Environs Development Plan Core Strategy Conceptual Map



Future Background Traffic Volumes

6.3 TII, in their Project Appraisal Guidelines for National Roads Unit 5.3 Travel Demand Projections PE-PAG-02017 October 2016, envisage that light vehicle traffic would increase by an annual growth factor of up to 1.0092, during the period up to 2030, based on their high sensitivity growth scenario for County Mayo. Thereafter, TII envisage that light vehicle traffic would increase by an annual average factor of up to 1.0024, to 2050, for their high sensitivity growth scenario. The equivalent annual growth factors, envisaged by TII for heavy vehicle traffic, are 1.0242 and 1.0195, respectively.

6.4 Subject to planning permission, it is envisaged for this Assessment that the proposed housing development would be fully complete by 2022.

6.5 The TII Traffic and Transport Assessment Guidelines PE-PDV-02045 May 2014 identify the opening year and future years, five and 15 years after the opening year, for considering the impact of a proposed development. In this case, the opening year is 2022, and the future years are 2027 and 2037.

6.6 The 2019 August summer peak season peak hour traffic volumes at the Golf Course Road/Newport Road junction have been factored to 2022, 2027 and 2037 levels on the basis of the TII high sensitivity growth rates, and are provided in Table 4.

Table 4: Predicted Traffic Volumes Without Proposed Housing development

Junction	Year	Approach	Movement	PM Peak Hour Total Vehicles (Heavy Vehicles)
Golf Course Road/Newport Road	2022	Newport Road North Westbound	Left	98 (1)
			Straight	230 (4)
		Golf Course Road	Left	10
			Right	68
		Newport Road South Eastbound	Right	11
			Straight	230 (4)
	2027	Newport Road North Westbound	Left	102 (1)
			Straight	242 (5)
		Golf Course Road	Left	11
			Right	71
		Newport Road South Eastbound	Right	12
			Straight	242 (5)
	2037	Newport Road North Westbound	Left	108 (2)
			Straight	254 (6)
		Golf Course Road	Left	11
			Right	75
		Newport Road South Eastbound	Right	12
			Straight	254 (6)

6.7 The predicted 2022, 2027 and 2037 urban and suburban road link peak hour volume/capacity ratios for Golf Course Road and Newport Road, respectively, are provided in Table 5, on the basis of the UK Traffic Capacity of Urban Roads TA 79/99.

Table 5: Predicted Urban and Suburban Road Link Peak Hour Volume/Capacity Ratios Without Proposed Housing Development

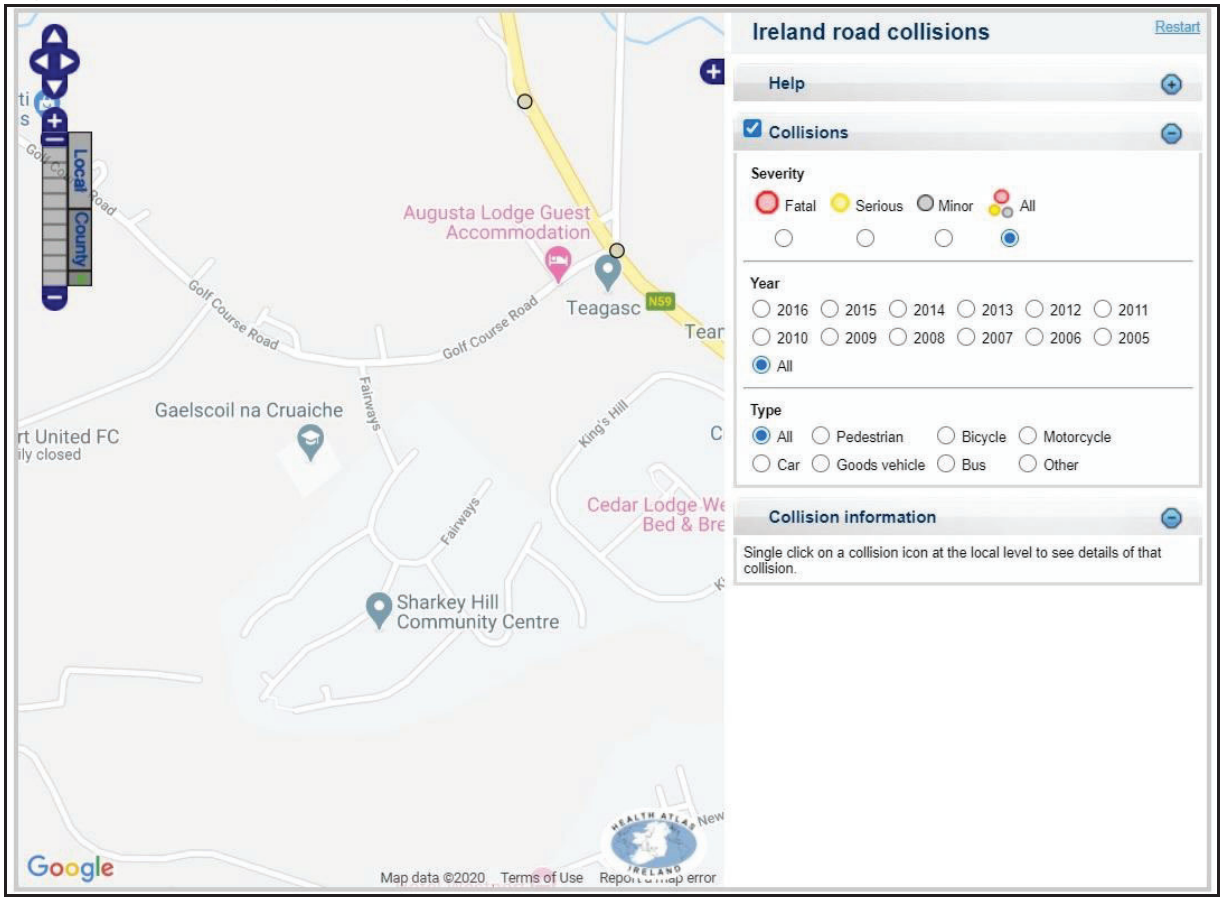
Urban Road	Year	Direction	Peak Hour Vehicles/ Highest Direction	Capacity/Hour/ Direction (Vehicles)	Volume/ Capacity Ratio
Golf Course Road	2022	South Westbound	109	900	12%
		North Eastbound	78		9%
	2027	South Westbound	114		13%
		North Eastbound	82		9%
	2037	South Westbound	120		13%
		North Eastbound	86		10%
Newport Road	2022	North Westbound	328	1,020	32%
		South Eastbound	241		24%
	2027	North Westbound	344		34%
		South Eastbound	254		25%
	2037	North Westbound	362		36%
		South Eastbound	266		26%

6.8 Golf Course Road and Newport Road would continue to operate within their urban and suburban, respectively, road link capacities, for the predicted 2022, 2027 and 2037 peak hour traffic volumes, with highest road link volume/capacity ratios of up to 13% and 36%, respectively, in 2037.

7.0 RSA COLLISIONS DATA

7.1 The Road Safety Authority (RSA) online accident collision records for Westport, in the vicinity of the existing site, for the available years 2005 to 2016 inclusive, are shown in Figure 3.

Figure 3: Road Safety Authority (RSA) Online Accident Collision Records



7.2 There are no RSA recorded accident collisions on Golf Course Road, in the vicinity of the existing site, for the available years 2005 to 2016 inclusive. There was one recorded accident collision at the existing N59 Newport Road/Golf Course Road junction. This was a minor collision type that occurred in 2005.

8.0 TRAFFIC IMPACT

8.1 The proposed housing development includes 50 mixed-size units including 12 two-bedroom units and 38 three-bedroom units.

8.2 Subject to planning permission, it is envisaged for this Assessment that the proposed 50 units' housing development would be fully complete by 2022.

Access

8.3 Access for the proposed housing development is proposed via two accesses on Golf Course Road and one access on the local access road, south west of the location of the existing site access gate. Separate pedestrian accesses are also proposed on Golf Course Road, at the east end of the site and between the two vehicle accesses.

TRICS Vehicle Trip Rates

8.4 The Chartered Institution of Highways and Transportation (CIHT) Trip Rate Information Computer System (TRICS) database peak hour and daily trip generation rates, for the proposed housing development residential use, are detailed in Table 6. The proposed housing development would be located within walking and cycling distance of the town centre.

Table 6: TRICS Residential Vehicle Trip Rates

Time Period	Vehicles/Housing Unit	
	Arrivals	Departures
Evening Peak Hour	0.57/unit	0.23/unit
Daily	2.65/unit	2.65/unit

Vehicle Trips

8.5 The predicted evening peak hour and daily vehicle trips, for the proposed housing development, on the basis of the CIHT TRICS database and the proposed development total 50 housing units, are provided in Table 7.

Table 7: Predicted Proposed Development Vehicle Trips

Time Period	Vehicles	
	Arrivals	Departures
Evening Peak Hour	29	12
Daily	133	133

8.6 The proposed housing development would generate a total of 41 two-way vehicle trips during the peak hour, on the basis of TRICS. The TRICS predicted daily vehicle trips would be up to 133 trips, both inbound and outbound.

8.7 It is envisaged that the distribution of vehicle trips generated by the proposed housing development would be 100% to and from Newport Road, and similar to existing at the Golf Course Road/Newport Road junction.

Golf Course Road/Newport Road Junction Traffic Volumes

8.8 The predicted 2022, 2027 and 2037 peak hour traffic volumes at the Golf Course Road/Newport Road junction, with the proposed housing development in place, are provided in Table 8.

Table 8: Predicted Traffic Volumes With Proposed Housing development

Junction	Year	Approach	Movement	PM Peak Hour	
				Total Vehicles (Heavy Vehicles)	Change
Golf Course Road/Newport Road	2022	Newport Road North Westbound	Left	124 (1)	+26
			Straight	230 (4)	0
		Golf Course Road	Left	12	+2
			Right	78	+10
		Newport Road South Eastbound	Right	14	+3
			Straight	225 (8)	0
	2027	Newport Road North Westbound	Left	128 (1)	+26
			Straight	242 (5)	0
		Golf Course Road	Left	13	+2
			Right	81	+10
		Newport Road South Eastbound	Right	15	+3
			Straight	237 (10)	0
	2037	Newport Road North Westbound	Left	134 (2)	+26
			Straight	254 (6)	0
		Golf Course Road	Left	13	+2
			Right	85	+10
		Newport Road South Eastbound	Right	15	+3
			Straight	250 (12)	0

Link Traffic Volumes

8.9 The predicted 2022, 2027 and 2037 evening peak hour traffic volumes, on the existing local road network, with the proposed housing development, are provided in Table 9.

Table 9: Predicted Traffic Volumes With Proposed Development

Road Link	Year	PM Peak Hour	
		Total Vehicles (Change)	% Change
Newport Road Southeast	2022	657 (+36)	(+5.8%)
	2027	688 (+36)	(+5.5%)
	2037	723 (+36)	(+5.2%)
Golf Course Road	2022	228 (+41)	(+21.9%)
	2027	237 (+41)	(+20.9%)
	2037	247 (+41)	(+19.9%)
Newport Road Northwest	2022	481 (+5)	(+1.1%)
	2027	507 (+5)	(+1.0%)
	2037	532 (+5)	(+1.0%)

8.10 The proposed housing development would increase two-way peak hour traffic volumes on Golf Course Road by up to 41 vehicles during the daily peak hour. This would equate to a highest increase of 21.9%. The predicted increase on Newport Road would be up to 36 vehicles during the daily peak hour. This would equate to a highest increase of 5.8%. The predicted percentage increases are on the basis of relatively low future baseline traffic volumes, as both roads are operating well within their urban and suburban road link capacities.

Urban and Suburban Road Link Volume/Capacity Ratios

8.11 The predicted 2022, 2027 and 2037 urban and suburban road link peak hour volume/capacity ratios for Golf Course Road and Newport Road, in the vicinity of the proposed development site, with the proposed housing development in place, are provided in Table 10, on the basis of the UK Traffic Capacity of Urban Roads TA 79/99.

Table 10: Predicted Urban and Suburban Road Link Peak Hour Volume/Capacity Ratios With Proposed Housing Development

50 km/hour Urban Road	Year	Direction	Peak Hour Vehicles/ Highest Direction	Capacity/Hour/ Direction (Vehicles)	Volume/ Capacity Ratio
Golf Course Road	2022	South Westbound	138	900	15%
		North Eastbound	90		10%
	2027	South Westbound	143		16%
		North Eastbound	94		11%
	2037	South Westbound	159		18%
		North Eastbound	98		11%
Newport Road	2022	North Westbound	354	1,020	35%
		South Eastbound	251		25%
	2027	North Westbound	370		36%
		South Eastbound	264		26%
	2037	North Westbound	388		38%
		South Eastbound	276		27%

8.12 Golf Course Road and Newport Road would continue to operate well within their urban and suburban, respectively, road link capacities, for the predicted 2022, 2027 and 2037 peak hour traffic volumes, with the proposed housing development in place, with highest road link volume/capacity ratios of up to 18% and 38%, respectively, in 2037. These compare to highest ratios of 13% and 36%, respectively, without the proposed housing development.

Golf Course Road/Newport Road Junction Capacity Analysis

8.13 The existing L1802 Golf Course Road/N59 Newport Road junction has been analysed using the computer software programme PICADY, for the predicted 2022, 2027 and 2037 peak hour traffic volumes, with and without the proposed housing development in place.

8.14 The predicted evening peak hour traffic volumes have been transposed to determine predicted morning peak hour traffic volumes, in order to consider a robust basis for this Assessment.

8.15 Full details of the PICADY junction analysis is provided in Appendix A. The results are summarised in Table 11.

Table 11: Summary of Golf Course Road/Newport Road Peak Hour PICADY Junction Capacity Analysis

Year	Peak Hour	Development Scenario	Highest Ratio of Flow to Capacity (RFC)	Highest Mean Maximum Queue Length (vehicles)	Highest Delay per Vehicle (minutes)
2022	AM	Without	0.231	0.3	0.15
		With	0.290	0.4	0.16
	PM	Without	0.165	0.2	0.14
		With	0.191	0.2	0.14
2027	AM	Without	0.245	0.3	0.15
		With	0.308	0.4	0.17
	PM	Without	0.175	0.2	0.14
		With	0.202	0.2	0.15
2037	AM	Without	0.264	0.4	0.16
		With	0.328	0.5	0.18
	PM	Without	0.185	0.2	0.15
		With	0.213	0.3	0.15

8.16 A Ratio of Flow to Capacity (RFC) of 0.900 is considered to represent the typical practical capacity of junction. The above analysis indicates that the existing Golf Course Road/Newport Road junction would operate well within practical capacity, without significant traffic queuing and delays, during the predicted 2022, 2027 and 2037 peak hours, both without and with the proposed housing development in place.

8.17 The existing Golf Course Road/Newport Road junction would operate with a highest RFC of 0.328 with the proposed housing development in place. Highest delays per vehicle would be 0.18 minutes. These compare to a highest ratio of 0.264 and highest delays per vehicle 0f 0.16 minutes without the proposed housing development.

Recommended Mitigation: Pedestrian Footway

8.18 It is recommended that a footway facility should be provided on Golf Course Road and the adjacent local access road, locally, along the extent of the proposed site, with crossing locations at its Golf Course Road junction with the local access road. This would facilitate pedestrians generated by the proposed housing development and other users. The Golf Course Road footway facility should be consistent with, or make provision for, the Westport Town and Environs Development Plan cycleway/walkway facilities along Golf Course Road, as appropriate.

EPA EIAR Guidelines

8.19 On the basis of the EPA EIAR Guidelines, the traffic effects of the proposed housing development would be not significant to slight.

Construction Traffic

8.20 Subject to planning permission, it is envisaged that the proposed housing development would be fully complete by 2022. The expected on-site construction period is up to 12 to 18 months.

8.21 Peak construction employment is expected to be of the order of up to 30 staff. Excavated material would be removed off-site by a licensed haulier to a licensed landfill.

8.22 All construction car parking and site compounds would be located within the existing site confines. All necessary construction signage and construction traffic management would be in accordance with the requirements of Mayo County Council.

9.0 SUMMARY AND CONCLUSIONS

9.1 The proposed housing development includes 50 mixed-size units including 12 two-bedroom units and 38 three-bedroom units.

9.2 Subject to planning permission, it is envisaged for this Assessment that the proposed 50 units' housing development would be fully complete by 2022.

Access

9.3 Access for the proposed housing development is proposed via two accesses on Golf Course Road and one access on the local access road, south west of the location of the existing site access gate. Separate pedestrian accesses are also proposed on Golf Course Road, at the east end of the site and between the two vehicle accesses.

9.4 The proposed housing development would be located within walking and cycling distance of the town centre.

Vehicle Trips

9.5 The proposed housing development would generate a total of 41 two-way vehicle trips during the peak hour, on the basis of TRICS. The TRICS predicted daily vehicle trips would be up to 133 trips, both inbound and outbound.

Road Link Traffic Volumes

9.6 The proposed housing development would increase two-way peak hour traffic volumes on Golf Course Road by up to 41 vehicles during the daily peak hour. This would equate to a highest increase of 21.9%. The predicted increase on Newport Road would be up to 36 vehicles during the daily peak hour. This would equate to a highest increase of 5.8%. The predicted percentage increases are on the basis of relatively low future baseline traffic volumes, as both roads are operating well within their urban and suburban road link capacities.

Urban Road Link Volume/Capacity Ratios

9.7 Golf Course Road and Newport Road would continue to operate well within their urban and suburban, respectively, road link capacities, for the predicted 2022, 2027 and 2037 peak hour traffic volumes, with the proposed housing development in place, with highest road link volume/capacity ratios of up to 18% and 38%, respectively, in 2037. These compare to highest ratios of 13% and 36%, respectively, without the proposed housing development.

Golf Course Road/Newport Road Junction Capacity Analysis

9.8 During the August 2020 traffic count surveys for this Assessment, no vehicles were recorded using the restrictive width L6813 Local Road via its Newport Road/Golf Course Road junction. Cyclists were recorded using the L6813 for access to/from the Great Western Greenway. All recorded cyclists accessed the L6813 via the Toucan crossing located south east of the Newport Road/Golf Course Road junction, and none were recorded using the road junction.

9.9 The existing Golf Course Road/Newport Road junction would operate well within practical capacity, without significant traffic queuing and delays, during the predicted 2022, 2027 and 2037 peak hours, both without and with the proposed housing development in place.

9.10 The existing Golf Course Road/Newport Road junction would operate with a highest RFC of 0.328 with the proposed housing development in place. Highest delays per vehicle would be 0.18 minutes. These compare to a highest ratio of 0.264 and highest delays per vehicle 0f 0.16 minutes without the proposed housing development.

Recommended Mitigation: Pedestrian Footway

9.11 It is recommended that a footway facility should be provided on Golf Course Road and the adjacent local access road, locally, along the extent of the proposed site, with crossing locations at its Golf Course Road junction with the local access road. This would facilitate pedestrians generated by the proposed housing development and other users. The Golf Course Road footway facility should be consistent with, or make provision for, the Westport Town and Environs Development Plan cycleway/walkway facilities along Golf Course Road, as appropriate.

EPA EIAR Guidelines

9.12 On the basis of the EPA EIAR Guidelines, the traffic effects of the proposed housing development would be not significant to slight.

Stage 1 Road Safety Audit

9.13 The Part 8 planning documentation, for the proposed housing development, also includes a Stage 1 Road Safety Audit.

APPENDIX A

PICADY Junction Capacity Analysis

```
                                TRL LIMITED

                            (C) COPYRIGHT 2001

   CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

                          PICADY 4.1  ANALYSIS PROGRAM
                             RELEASE 4.0 (NOV 2003)

                    ADAPTED FROM PICADY/3 WHICH IS CROWN COPYRIGHT
                       BY PERMISSION OF THE CONTROLLER OF HMSO

               ------------------------------------------------------
                      FOR SALES AND DISTRIBUTION INFORMATION,
                      PROGRAM ADVICE AND MAINTENANCE CONTACT:
                                TRL SOFTWARE BUREAU
                     TEL: CROWTHORNE (01344) 770758, FAX: 770864
                           EMAIL: SoftwareBureau@trl.co.uk
               ------------------------------------------------------


 THE USER OF THIS COMPUTER PROGRAM FOR THE SOLUTION OF AN ENGINEERING PROBLEM IS
 IN NO WAY  RELIEVED OF HIS RESPONSIBILITY  FOR THE CORRECTNESS  OF THE SOLUTION


 Run with file:- "C:\21336 Hudson Bay\21583WPPY01.vpi" (drive-on-the-left ) at 14:35:09
on Thursday, 6 August 2020

  RUN TITLE
  *********
  Golf Course Road/Newport Road - 2022 AM Peak Without Proposed Development


 .MAJOR/MINOR JUNCTION CAPACITY AND DELAY
  ***************************************

  INPUT DATA
  ----------

                     MAJOR ROAD (ARM C) ---------------------- MAJOR ROAD (ARM A)
                                                 I
                                                 I
                                                 I
                                                 I
                                                 I
                                                 I
                                            MINOR ROAD (ARM B)

 ARM A IS N59 Newport Road Southeast
 ARM B IS L1802 Golf Course Road
 ARM C IS N59 Newport Road Northwest


 STREAM LABELLING CONVENTION
 ---------------------------

        STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

        STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C

        ETC.



 .GEOMETRIC DATA
  --------------


 ------------------------------------------------------------------
 I                DATA ITEM                 I   MINOR ROAD B    I
```

```
 ------------------------------------------------------------------
 I  TOTAL MAJOR ROAD CARRIAGEWAY WIDTH      I ( W  )  6.60 M.   I
 I  CENTRAL RESERVE WIDTH                   I (WCR )  0.00 M.   I
 I                                          I                   I
 I  MAJOR ROAD RIGHT TURN - WIDTH           I (WC-B)  2.20 M.   I
 I                        - VISIBILITY      I (VC-B) 210.0 M.   I
 I                        - BLOCKS TRAFFIC  I         YES       I
 I                                          I                   I
 I  MINOR ROAD - VISIBILITY TO LEFT         I (VB-C) 120.0 M.   I
 I             - VISIBILITY TO RIGHT        I (VB-A) 120.0 M.   I
 I             - LANE 1 WIDTH               I (WB-C)  3.50 M.   I
 I             - LANE 2 WIDTH               I (WB-A)  0.00 M.   I
 ------------------------------------------------------------------
```

.

.TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 11.00 AND ENDS 12.00

LENGTH OF TIME PERIOD - 60 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

.

TIME	FROM/TO	TURNING PROPORTIONS / TURNING COUNTS (PERCENTAGE OF H.V.S) ARM A	ARM B	ARM C
11.00 - 12.00	ARM A	0.000	0.232	0.768
		0.0	68.0	225.0
		(0.0)	(0.0)	(3.6)
	ARM B	0.899	0.000	0.101
		98.0	0.0	11.0
		(1.0)	(0.0)	(0.0)
	ARM C	0.958	0.042	0.000
		230.0	10.0	0.0
		(1.7)	(0.0)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

.

TIME		DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
11.00-11.15									
	B-AC	1.73	8.44	0.205		0.0	0.3	3.7	
	C-AB	0.22	12.68	0.017		0.0	0.0	0.3	
	C-A	3.58							

```
 I   A-B       1.08
I
 I   A-C       3.56
I
 I
I
 ------------------------------------------------------------------------------------------
----------

.------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 11.15-11.30
I
 I   B-AC      1.82      8.35    0.218                0.3    0.3        4.1
I
 I   C-AB      0.23     12.74    0.018                0.0    0.0        0.3
I
 I   C-A       3.77
I
 I   A-B       1.13
I
 I   A-C       3.75
I
 I
I
 ------------------------------------------------------------------------------------------
----------

.------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 11.30-11.45
I
 I   B-AC      1.91      8.25    0.231                0.3    0.3        4.4
I
 I   C-AB      0.25     12.80    0.020                0.0    0.0        0.4
I
 I   C-A       3.95
I
 I   A-B       1.19
I
 I   A-C       3.93
I
 I
I
 ------------------------------------------------------------------------------------------
----------

.------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 11.45-12.00
I
 I   B-AC      1.82      8.35    0.218                0.3    0.3        4.3
I
```

```
 I   C-AB      0.23     12.74    0.018                0.0    0.0        0.3
I
 I   C-A       3.77
I
 I   A-B       1.13
I
 I   A-C       3.75
I
 I
I
 ------------------------------------------------------------------------------------------
----------

 *WARNING* NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR
.
 QUEUE FOR STREAM   B-AC
 -------------------------
 TIME SEGMENT    NO. OF
   ENDING      VEHICLES
               IN QUEUE
   11.15           0.3
   11.30           0.3
   11.45           0.3
   12.00           0.3
.
 QUEUE FOR STREAM   C-AB
 -------------------------
 TIME SEGMENT    NO. OF
   ENDING      VEHICLES
               IN QUEUE
   11.15           0.0
   11.30           0.0
   11.45           0.0
   12.00           0.0
.
                QUEUEING DELAY INFORMATION OVER WHOLE PERIOD
                --------------------------------------------

 ------------------------------------------------------------------------------
 I STREAM I   TOTAL DEMAND  I   * QUEUEING *      I * INCLUSIVE QUEUEING * I
 I        I                 I    * DELAY *        I       * DELAY *        I
 I        I-----------------------------------------------------------------I
 I        I  (VEH)   (VEH/H) I  (MIN)     (MIN/VEH) I    (MIN)      (MIN/VEH) I
 ------------------------------------------------------------------------------
 I  B-AC  I  109.2 I  109.2 I    16.4 I    0.15   I      16.4  I    0.15   I
 I  C-AB  I   14.0 I   14.0 I     1.3 I    0.09   I       1.3  I    0.09   I
 I  C-A   I  226.0 I  226.0 I         I           I            I           I
 I  A-B   I   68.0 I   68.0 I         I           I            I           I
 I  A-C   I  224.8 I  224.8 I         I           I            I           I
 ------------------------------------------------------------------------------
 I  ALL   I  642.0 I  642.0 I    17.7 I    0.03   I      17.7  I    0.03   I
 ------------------------------------------------------------------------------


 * DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
 * INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING 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.



 END OF JOB

 ****** PICADY 4 run completed.
============================================= end of file
=============================================
```

```
                                TRL LIMITED

                            (C) COPYRIGHT 2001

   CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

                          PICADY 4.1  ANALYSIS PROGRAM
                             RELEASE 4.0 (NOV 2003)

                    ADAPTED FROM PICADY/3 WHICH IS CROWN COPYRIGHT
                       BY PERMISSION OF THE CONTROLLER OF HMSO

               ------------------------------------------------------
                      FOR SALES AND DISTRIBUTION INFORMATION,
                      PROGRAM ADVICE AND MAINTENANCE CONTACT:
                                TRL SOFTWARE BUREAU
                     TEL: CROWTHORNE (01344) 770758, FAX: 770864
                           EMAIL: SoftwareBureau@trl.co.uk
               ------------------------------------------------------


 THE USER OF THIS COMPUTER PROGRAM FOR THE SOLUTION OF AN ENGINEERING PROBLEM IS
 IN NO WAY  RELIEVED OF HIS RESPONSIBILITY  FOR THE CORRECTNESS  OF THE SOLUTION


 Run with file:- "C:\21336 Hudson Bay\21583WPPY02.vpi" (drive-on-the-left ) at 14:38:43
on Thursday, 6 August 2020

  RUN TITLE
  *********
  Golf Course Road/Newport Road - 2022 AM Peak With Proposed Development


 .MAJOR/MINOR JUNCTION CAPACITY AND DELAY
  ***************************************

  INPUT DATA
  ----------

                     MAJOR ROAD (ARM C) ---------------------- MAJOR ROAD (ARM A)
                                                I
                                                I
                                                I
                                                I
                                                I
                                                I
                                           MINOR ROAD (ARM B)

 ARM A IS N59 Newport Road Southeast
 ARM B IS L1802 Golf Course Road
 ARM C IS N59 Newport Road Northwest


 STREAM LABELLING CONVENTION
 ---------------------------

        STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

        STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C

        ETC.



 .GEOMETRIC DATA
  --------------


 ------------------------------------------------------------------
 I                DATA ITEM                 I   MINOR ROAD B    I
```

```
 ------------------------------------------------------------------
 I  TOTAL MAJOR ROAD CARRIAGEWAY WIDTH      I ( W  )  6.60 M.   I
 I  CENTRAL RESERVE WIDTH                   I (WCR )  0.00 M.   I
 I                                          I                   I
 I  MAJOR ROAD RIGHT TURN - WIDTH           I (WC-B)  2.20 M.   I
 I                        - VISIBILITY      I (VC-B) 210.0 M.   I
 I                        - BLOCKS TRAFFIC  I         YES       I
 I                                          I                   I
 I  MINOR ROAD - VISIBILITY TO LEFT         I (VB-C) 120.0 M.   I
 I             - VISIBILITY TO RIGHT        I (VB-A) 120.0 M.   I
 I             - LANE 1 WIDTH               I (WB-C)  3.50 M.   I
 I             - LANE 2 WIDTH               I (WB-A)  0.00 M.   I
 ------------------------------------------------------------------
```

.

.TRAFFIC DEMAND DATA

```
 TIME PERIOD BEGINS 11.00 AND ENDS 12.00

 LENGTH OF TIME PERIOD  -  60   MINUTES.
 LENGTH OF TIME SEGMENT -  15   MINUTES.

 DEMAND FLOW PROFILES ARE INPUT DIRECTLY.
.
 ------------------------------------------------------------
 I                   I         TURNING PROPORTIONS        I
 I                   I         TURNING COUNTS             I
 I                   I        (PERCENTAGE OF H.V.S)       I
 I                   ------------------------------------
 I        TIME       I FROM/TO I  ARM A I  ARM B I  ARM C I
 ------------------------------------------------------------
 I   11.00 - 12.00   I         I        I        I        I
 I                   I  ARM A  I  0.000 I  0.257 I  0.743 I
 I                   I         I    0.0 I   78.0 I  225.0 I
 I                   I         I (  0.0)I (  0.0)I (  3.6)I
 I                   I         I        I        I        I
 I                   I  ARM B  I  0.899 I  0.000 I  0.101 I
 I                   I         I  124.0 I    0.0 I   14.0 I
 I                   I         I (  0.8)I (  0.0)I (  0.0)I
 I                   I         I        I        I        I
 I                   I  ARM C  I  0.950 I  0.050 I  0.000 I
 I                   I         I  230.0 I   12.0 I    0.0 I
 I                   I         I (  1.7)I (  0.0)I (  0.0)I
 I                   I         I        I        I        I
 ------------------------------------------------------------

 TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

 THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

.-------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 11.00-11.15
I
 I   B-AC      2.19      8.43    0.260                0.0    0.3        5.0
I
 I   C-AB      0.26     12.64    0.021                0.0    0.0        0.4
I
 I   C-A       3.57
I
```

```
 I   A-B       1.24
I
 I   A-C       3.56
I
 I
I
 ------------------------------------------------------------------------------------------
----------

.------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 11.15-11.30
I
 I   B-AC      2.30      8.33    0.276                0.3    0.4        5.5
I
 I   C-AB      0.28     12.70    0.022                0.0    0.0        0.4
I
 I   C-A       3.75
I
 I   A-B       1.30
I
 I   A-C       3.75
I
 I
I
 ------------------------------------------------------------------------------------------
----------

.------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 11.30-11.45
I
 I   B-AC      2.42      8.36    0.290                0.4    0.4        5.9
I
 I   C-AB      0.30     12.88    0.023                0.0    0.0        0.4
I
 I   C-A       3.93
I
 I   A-B       1.24
I
 I   A-C       3.56
I
 I
I
 ------------------------------------------------------------------------------------------
----------

.------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 11.45-12.00
I
 I   B-AC      2.30      8.33    0.276                0.4    0.4        5.9
I
```

```
 I   C-AB       0.28     12.70    0.022                0.0    0.0        0.4
I
 I   C-A        3.75
I
 I   A-B        1.30
I
 I   A-C        3.75
I
 I
I
 ------------------------------------------------------------------------------------------
----------

 *WARNING* NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR
.
 QUEUE FOR STREAM   B-AC
 -------------------------
 TIME SEGMENT    NO. OF
   ENDING      VEHICLES
               IN QUEUE
   11.15           0.3
   11.30           0.4
   11.45           0.4
   12.00           0.4
.
 QUEUE FOR STREAM   C-AB
 -------------------------
 TIME SEGMENT    NO. OF
   ENDING      VEHICLES
               IN QUEUE
   11.15           0.0
   11.30           0.0
   11.45           0.0
   12.00           0.0
.
                QUEUEING DELAY INFORMATION OVER WHOLE PERIOD
                --------------------------------------------

 ------------------------------------------------------------------------------
 I STREAM I   TOTAL DEMAND  I   * QUEUEING *      I * INCLUSIVE QUEUEING * I
 I        I                 I    * DELAY *        I       * DELAY *        I
 I        I-----------------------------------------------------------------I
 I        I  (VEH)   (VEH/H) I  (MIN)     (MIN/VEH) I    (MIN)      (MIN/VEH) I
 ------------------------------------------------------------------------------
 I  B-AC  I  138.2 I  138.2 I    22.3 I    0.16   I      22.3  I    0.16   I
 I  C-AB  I   16.8 I   16.8 I     1.6 I    0.10   I       1.6  I    0.10   I
 I  C-A   I  225.0 I  225.0 I         I           I            I           I
 I  A-B   I   76.1 I   76.1 I         I           I            I           I
 I  A-C   I  219.4 I  219.4 I         I           I            I           I
 ------------------------------------------------------------------------------
 I  ALL   I  675.4 I  675.4 I    23.9 I    0.04   I      23.9  I    0.04   I
 ------------------------------------------------------------------------------


 * DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
 * INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING 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.



 END OF JOB

 ****** PICADY 4 run completed.
============================================= end of file
=============================================
```

```
                                TRL LIMITED

                            (C) COPYRIGHT 2001

   CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

                          PICADY 4.1  ANALYSIS PROGRAM
                             RELEASE 4.0 (NOV 2003)

                    ADAPTED FROM PICADY/3 WHICH IS CROWN COPYRIGHT
                       BY PERMISSION OF THE CONTROLLER OF HMSO

               ------------------------------------------------------
                      FOR SALES AND DISTRIBUTION INFORMATION,
                      PROGRAM ADVICE AND MAINTENANCE CONTACT:
                                TRL SOFTWARE BUREAU
                     TEL: CROWTHORNE (01344) 770758, FAX: 770864
                           EMAIL: SoftwareBureau@trl.co.uk
               ------------------------------------------------------


 THE USER OF THIS COMPUTER PROGRAM FOR THE SOLUTION OF AN ENGINEERING PROBLEM IS
 IN NO WAY  RELIEVED OF HIS RESPONSIBILITY  FOR THE CORRECTNESS  OF THE SOLUTION


 Run with file:- "C:\21336 Hudson Bay\21583WPPY03.vpi" (drive-on-the-left ) at 14:42:25
on Thursday, 6 August 2020

  RUN TITLE
  *********
  Golf Course Road/Newport Road - 2022 PM Peak Without Proposed Development


 .MAJOR/MINOR JUNCTION CAPACITY AND DELAY
  ***************************************

  INPUT DATA
  ----------

                     MAJOR ROAD (ARM C) ---------------------- MAJOR ROAD (ARM A)
                                                I
                                                I
                                                I
                                                I
                                                I
                                                I
                                           MINOR ROAD (ARM B)

 ARM A IS N59 Newport Road Southeast
 ARM B IS L1802 Golf Course Road
 ARM C IS N59 Newport Road Northwest


 STREAM LABELLING CONVENTION
 ---------------------------

        STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

        STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C

        ETC.



 .GEOMETRIC DATA
  --------------


 ------------------------------------------------------------------
 I                DATA ITEM                 I   MINOR ROAD B    I
```

```
 ------------------------------------------------------------------
 I  TOTAL MAJOR ROAD CARRIAGEWAY WIDTH      I ( W  )  6.60 M.   I
 I  CENTRAL RESERVE WIDTH                   I (WCR )  0.00 M.   I
 I                                          I                   I
 I  MAJOR ROAD RIGHT TURN - WIDTH           I (WC-B)  2.20 M.   I
 I                        - VISIBILITY      I (VC-B) 210.0 M.   I
 I                        - BLOCKS TRAFFIC  I         YES       I
 I                                          I                   I
 I  MINOR ROAD - VISIBILITY TO LEFT         I (VB-C) 120.0 M.   I
 I             - VISIBILITY TO RIGHT        I (VB-A) 120.0 M.   I
 I             - LANE 1 WIDTH               I (WB-C)  3.50 M.   I
 I             - LANE 2 WIDTH               I (WB-A)  0.00 M.   I
 ------------------------------------------------------------------
```

.

.TRAFFIC DEMAND DATA

```
 TIME PERIOD BEGINS 17.00 AND ENDS 18.00

 LENGTH OF TIME PERIOD  -  60   MINUTES.
 LENGTH OF TIME SEGMENT -  15   MINUTES.

 DEMAND FLOW PROFILES ARE INPUT DIRECTLY.
.
 ------------------------------------------------------------
 I                    I         TURNING PROPORTIONS        I
 I                    I         TURNING COUNTS             I
 I                    I        (PERCENTAGE OF H.V.S)       I
 I                    ------------------------------------
 I        TIME        I FROM/TO I  ARM A I  ARM B I  ARM C I
 ------------------------------------------------------------
 I   17.00 - 18.00    I         I        I        I        I
 I                    I  ARM A  I  0.000 I  0.299 I  0.701 I
 I                    I         I    0.0 I   98.0 I  230.0 I
 I                    I         I (  0.0)I (  1.0)I (  1.7)I
 I                    I         I        I        I        I
 I                    I  ARM B  I  0.872 I  0.000 I  0.128 I
 I                    I         I   68.0 I    0.0 I   10.0 I
 I                    I         I (  0.0)I (  0.0)I (  0.0)I
 I                    I         I        I        I        I
 I                    I  ARM C  I  0.953 I  0.047 I  0.000 I
 I                    I         I  225.0 I   11.0 I    0.0 I
 I                    I         I (  3.6)I (  0.0)I (  0.0)I
 I                    I         I        I        I        I
 ------------------------------------------------------------

 TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

 THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

.-------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 17.00-17.15
I
 I   B-AC      1.24      8.52    0.146                0.0    0.2        2.4
I
 I   C-AB      0.24     12.49    0.019                0.0    0.0        0.3
I
 I   C-A       3.50
I
```

```
 I   A-B       1.55
I
 I   A-C       3.64
I
 I
I
 ------------------------------------------------------------------------------------------
----------

.------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 17.15-17.30
I
 I   B-AC      1.30      8.42    0.154                0.2    0.2        2.7
I
 I   C-AB      0.26     12.54    0.020                0.0    0.0        0.4
I
 I   C-A       3.67
I
 I   A-B       1.63
I
 I   A-C       3.84
I
 I
I
 ------------------------------------------------------------------------------------------
----------

.------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 17.30-17.45
I
 I   B-AC      1.37      8.32    0.165                0.2    0.2        2.9
I
 I   C-AB      0.27     12.60    0.022                0.0    0.0        0.4
I
 I   C-A       3.86
I
 I   A-B       1.72
I
 I   A-C       4.02
I
 I
I
 ------------------------------------------------------------------------------------------
----------

.------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 17.45-18.00
I
 I   B-AC      1.30      8.42    0.154                0.2    0.2        2.8
I
```

```
 I   C-AB      0.26     12.54    0.020                0.0    0.0        0.4
I
 I   C-A       3.67
I
 I   A-B       1.63
I
 I   A-C       3.84
I
 I
I
 ------------------------------------------------------------------------------------------
----------

 *WARNING* NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR
.
 QUEUE FOR STREAM   B-AC
 -------------------------
 TIME SEGMENT    NO. OF
   ENDING      VEHICLES
               IN QUEUE
   17.15           0.2
   17.30           0.2
   17.45           0.2
   18.00           0.2
.
 QUEUE FOR STREAM   C-AB
 -------------------------
 TIME SEGMENT    NO. OF
   ENDING      VEHICLES
               IN QUEUE
   17.15           0.0
   17.30           0.0
   17.45           0.0
   18.00           0.0
.
                QUEUEING DELAY INFORMATION OVER WHOLE PERIOD
                --------------------------------------------

 ------------------------------------------------------------------------------
 I STREAM I   TOTAL DEMAND  I   * QUEUEING *      I * INCLUSIVE QUEUEING * I
 I        I                 I    * DELAY *        I       * DELAY *        I
 I        I-----------------------------------------------------------------I
 I        I  (VEH)   (VEH/H) I  (MIN)     (MIN/VEH) I    (MIN)      (MIN/VEH) I
 ------------------------------------------------------------------------------
 I  B-AC  I   78.2 I   78.2 I    10.8 I    0.14   I      10.8  I    0.14   I
 I  C-AB  I   15.4 I   15.4 I     1.5 I    0.10   I       1.5  I    0.10   I
 I  C-A   I  220.6 I  220.6 I         I           I            I           I
 I  A-B   I   98.0 I   98.0 I         I           I            I           I
 I  A-C   I  230.0 I  230.0 I         I           I            I           I
 ------------------------------------------------------------------------------
 I  ALL   I  642.1 I  642.1 I    12.3 I    0.02   I      12.3  I    0.02   I
 ------------------------------------------------------------------------------


 * DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
 * INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING 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.



 END OF JOB

 ****** PICADY 4 run completed.
============================================= end of file
=============================================
```

```
                                TRL LIMITED

                            (C) COPYRIGHT 2001

   CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

                          PICADY 4.1  ANALYSIS PROGRAM
                             RELEASE 4.0 (NOV 2003)

                    ADAPTED FROM PICADY/3 WHICH IS CROWN COPYRIGHT
                       BY PERMISSION OF THE CONTROLLER OF HMSO

               ------------------------------------------------------
                      FOR SALES AND DISTRIBUTION INFORMATION,
                      PROGRAM ADVICE AND MAINTENANCE CONTACT:
                                TRL SOFTWARE BUREAU
                     TEL: CROWTHORNE (01344) 770758, FAX: 770864
                           EMAIL: SoftwareBureau@trl.co.uk
               ------------------------------------------------------


 THE USER OF THIS COMPUTER PROGRAM FOR THE SOLUTION OF AN ENGINEERING PROBLEM IS
 IN NO WAY  RELIEVED OF HIS RESPONSIBILITY  FOR THE CORRECTNESS  OF THE SOLUTION


 Run with file:- "C:\21336 Hudson Bay\21583WPPY04.vpi" (drive-on-the-left ) at 14:44:59
on Thursday, 6 August 2020

  RUN TITLE
  *********
  Golf Course Road/Newport Road - 2022 PM Peak With Proposed Development


 .MAJOR/MINOR JUNCTION CAPACITY AND DELAY
  ***************************************

  INPUT DATA
  ----------

                     MAJOR ROAD (ARM C) ---------------------- MAJOR ROAD (ARM A)
                                                 I
                                                 I
                                                 I
                                                 I
                                                 I
                                                 I
                                            MINOR ROAD (ARM B)

 ARM A IS N59 Newport Road Southeast
 ARM B IS L1802 Golf Course Road
 ARM C IS N59 Newport Road Northwest


 STREAM LABELLING CONVENTION
 ---------------------------

        STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

        STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C

        ETC.



 .GEOMETRIC DATA
  --------------


 ------------------------------------------------------------------
 I                DATA ITEM                 I   MINOR ROAD B    I
```

```
 ------------------------------------------------------------------
 I  TOTAL MAJOR ROAD CARRIAGEWAY WIDTH      I ( W  )  6.60 M.   I
 I  CENTRAL RESERVE WIDTH                   I (WCR )  0.00 M.   I
 I                                          I                   I
 I  MAJOR ROAD RIGHT TURN - WIDTH           I (WC-B)  2.20 M.   I
 I                        - VISIBILITY      I (VC-B) 210.0 M.   I
 I                        - BLOCKS TRAFFIC  I         YES       I
 I                                          I                   I
 I  MINOR ROAD - VISIBILITY TO LEFT         I (VB-C) 120.0 M.   I
 I             - VISIBILITY TO RIGHT        I (VB-A) 120.0 M.   I
 I             - LANE 1 WIDTH               I (WB-C)  3.50 M.   I
 I             - LANE 2 WIDTH               I (WB-A)  0.00 M.   I
 ------------------------------------------------------------------
```

.

.TRAFFIC DEMAND DATA

```
 TIME PERIOD BEGINS 17.00 AND ENDS 18.00

 LENGTH OF TIME PERIOD  -  60   MINUTES.
 LENGTH OF TIME SEGMENT -  15   MINUTES.

 DEMAND FLOW PROFILES ARE INPUT DIRECTLY.
```

.

```
 ------------------------------------------------------------
 I                   I         TURNING PROPORTIONS        I
 I                   I         TURNING COUNTS             I
 I                   I        (PERCENTAGE OF H.V.S)       I
 I                   ---------------------------------------
 I        TIME       I FROM/TO I  ARM A I  ARM B I  ARM C I
 ------------------------------------------------------------
 I   17.00 - 18.00   I         I        I        I        I
 I                   I  ARM A  I  0.000 I  0.350 I  0.650 I
 I                   I         I    0.0 I  124.0 I  230.0 I
 I                   I         I (  0.0)I (  0.8)I (  1.7)I
 I                   I         I        I        I        I
 I                   I  ARM B  I  0.867 I  0.000 I  0.133 I
 I                   I         I   78.0 I    0.0 I   12.0 I
 I                   I         I (  0.0)I (  0.0)I (  0.0)I
 I                   I         I        I        I        I
 I                   I  ARM C  I  0.941 I  0.059 I  0.000 I
 I                   I         I  225.0 I   14.0 I    0.0 I
 I                   I         I (  3.6)I (  0.0)I (  0.0)I
 I                   I         I        I        I        I
 ------------------------------------------------------------

 TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

 THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

.-------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 17.00-17.15
I
 I   B-AC      1.43      8.47    0.169                0.0    0.2        2.9
I
 I   C-AB      0.31     12.39    0.025                0.0    0.0        0.5
I
 I   C-A       3.47
I
```

```
 I   A-B       1.97
I
 I   A-C       3.64
I
 I
I
 ------------------------------------------------------------------------------------------
----------

.------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 17.15-17.30
I
 I   B-AC      1.50      8.37    0.179                0.2    0.2        3.2
I
 I   C-AB      0.33     12.44    0.026                0.0    0.0        0.5
I
 I   C-A       3.65
I
 I   A-B       2.07
I
 I   A-C       3.83
I
 I
I
 ------------------------------------------------------------------------------------------
----------

.------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 17.30-17.45
I
 I   B-AC      1.58      8.27    0.191                0.2    0.2        3.5
I
 I   C-AB      0.35     12.47    0.028                0.0    0.0        0.5
I
 I   C-A       3.80
I
 I   A-B       2.17
I
 I   A-C       4.03
I
 I
I
 ------------------------------------------------------------------------------------------
----------

.------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 17.45-18.00
I
 I   B-AC      1.50      8.37    0.179                0.2    0.2        3.4
I
```

```
 I   C-AB      0.33     12.44    0.026                0.0    0.0        0.5
I
 I   C-A       3.65
I
 I   A-B       2.07
I
 I   A-C       3.83
I
 I
I
 ------------------------------------------------------------------------------------------
----------

 *WARNING* NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR
.
 QUEUE FOR STREAM   B-AC
 -------------------------
 TIME SEGMENT    NO. OF
   ENDING      VEHICLES
               IN QUEUE
   17.15           0.2
   17.30           0.2
   17.45           0.2
   18.00           0.2
.
 QUEUE FOR STREAM   C-AB
 -------------------------
 TIME SEGMENT    NO. OF
   ENDING      VEHICLES
               IN QUEUE
   17.15           0.0
   17.30           0.0
   17.45           0.0
   18.00           0.0
.
                QUEUEING DELAY INFORMATION OVER WHOLE PERIOD
                --------------------------------------------

 ------------------------------------------------------------------------------
 I STREAM I   TOTAL DEMAND  I   * QUEUEING *      I * INCLUSIVE QUEUEING * I
 I        I                 I    * DELAY *        I       * DELAY *        I
 I        I-----------------------------------------------------------------I
 I        I  (VEH)   (VEH/H) I  (MIN)     (MIN/VEH) I    (MIN)      (MIN/VEH) I
 ------------------------------------------------------------------------------
 I  B-AC  I   90.2 I   90.2 I    12.9 I    0.14   I      12.9  I    0.14   I
 I  C-AB  I   19.6 I   19.6 I     2.0 I    0.10   I       2.0  I    0.10   I
 I  C-A   I  218.7 I  218.7 I         I           I            I           I
 I  A-B   I  124.1 I  124.1 I         I           I            I           I
 I  A-C   I  230.1 I  230.1 I         I           I            I           I
 ------------------------------------------------------------------------------
 I  ALL   I  682.7 I  682.7 I    14.9 I    0.02   I      14.9  I    0.02   I
 ------------------------------------------------------------------------------


 * DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
 * INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING 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.



 END OF JOB

 ****** PICADY 4 run completed.
============================================= end of file
=============================================
```

```
                                TRL LIMITED

                            (C) COPYRIGHT 2001

   CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

                          PICADY 4.1  ANALYSIS PROGRAM
                             RELEASE 4.0 (NOV 2003)

                    ADAPTED FROM PICADY/3 WHICH IS CROWN COPYRIGHT
                       BY PERMISSION OF THE CONTROLLER OF HMSO

               ------------------------------------------------------
                      FOR SALES AND DISTRIBUTION INFORMATION,
                      PROGRAM ADVICE AND MAINTENANCE CONTACT:
                                TRL SOFTWARE BUREAU
                     TEL: CROWTHORNE (01344) 770758, FAX: 770864
                           EMAIL: SoftwareBureau@trl.co.uk
               ------------------------------------------------------


 THE USER OF THIS COMPUTER PROGRAM FOR THE SOLUTION OF AN ENGINEERING PROBLEM IS
 IN NO WAY  RELIEVED OF HIS RESPONSIBILITY  FOR THE CORRECTNESS  OF THE SOLUTION


 Run with file:- "C:\21336 Hudson Bay\21583WPPY05.vpi" (drive-on-the-left ) at 14:48:24
on Thursday, 6 August 2020

  RUN TITLE
  *********
  Golf Course Road/Newport Road - 2027 AM Peak Without Proposed Development


 .MAJOR/MINOR JUNCTION CAPACITY AND DELAY
  ***************************************

  INPUT DATA
  ----------

                     MAJOR ROAD (ARM C) ---------------------- MAJOR ROAD (ARM A)
                                                I
                                                I
                                                I
                                                I
                                                I
                                                I
                                           MINOR ROAD (ARM B)

 ARM A IS N59 Newport Road Southeast
 ARM B IS L1802 Golf Course Road
 ARM C IS N59 Newport Road Northwest


 STREAM LABELLING CONVENTION
 ---------------------------

        STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

        STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C

        ETC.



 .GEOMETRIC DATA
  --------------


 ------------------------------------------------------------------
 I                DATA ITEM                 I   MINOR ROAD B    I
```

```
 ------------------------------------------------------------------
 I  TOTAL MAJOR ROAD CARRIAGEWAY WIDTH      I ( W  )  6.60 M.   I
 I  CENTRAL RESERVE WIDTH                   I (WCR )  0.00 M.   I
 I                                          I                   I
 I  MAJOR ROAD RIGHT TURN - WIDTH           I (WC-B)  2.20 M.   I
 I                        - VISIBILITY      I (VC-B) 210.0 M.   I
 I                        - BLOCKS TRAFFIC  I         YES       I
 I                                          I                   I
 I  MINOR ROAD - VISIBILITY TO LEFT         I (VB-C) 120.0 M.   I
 I             - VISIBILITY TO RIGHT        I (VB-A) 120.0 M.   I
 I             - LANE 1 WIDTH               I (WB-C)  3.50 M.   I
 I             - LANE 2 WIDTH               I (WB-A)  0.00 M.   I
 ------------------------------------------------------------------
```

.

.TRAFFIC DEMAND DATA

```
 TIME PERIOD BEGINS 11.00 AND ENDS 12.00

 LENGTH OF TIME PERIOD  -  60   MINUTES.
 LENGTH OF TIME SEGMENT -  15   MINUTES.

 DEMAND FLOW PROFILES ARE INPUT DIRECTLY.
.
 ------------------------------------------------------------
 I                   I         TURNING PROPORTIONS        I
 I                   I         TURNING COUNTS             I
 I                   I        (PERCENTAGE OF H.V.S)       I
 I                   ------------------------------------
 I        TIME       I FROM/TO I  ARM A I  ARM B I  ARM C I
 ------------------------------------------------------------
 I   11.00 - 12.00   I         I        I        I        I
 I                   I  ARM A  I  0.000 I  0.231 I  0.769 I
 I                   I         I    0.0 I   71.0 I  237.0 I
 I                   I         I (  0.0)I (  0.0)I (  4.2)I
 I                   I         I        I        I        I
 I                   I  ARM B  I  0.895 I  0.000 I  0.105 I
 I                   I         I  102.0 I    0.0 I   12.0 I
 I                   I         I (  1.0)I (  0.0)I (  0.0)I
 I                   I         I        I        I        I
 I                   I  ARM C  I  0.957 I  0.043 I  0.000 I
 I                   I         I  242.0 I   11.0 I    0.0 I
 I                   I         I (  2.1)I (  0.0)I (  0.0)I
 I                   I         I        I        I        I
 ------------------------------------------------------------

 TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

 THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

.-------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 11.00-11.15
I
 I   B-AC      1.81      8.34    0.217                0.0    0.3        3.9
I
 I   C-AB      0.24     12.73    0.019                0.0    0.0        0.3
I
 I   C-A       3.77
I
```

```
 I   A-B       1.12
I
 I   A-C       3.76
I
 I
I
 ------------------------------------------------------------------------------------------
----------

.------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 11.15-11.30
I
 I   B-AC      1.90      8.25    0.230                0.3    0.3        4.4
I
 I   C-AB      0.26     12.80    0.020                0.0    0.0        0.4
I
 I   C-A       3.96
I
 I   A-B       1.18
I
 I   A-C       3.95
I
 I
I
 ------------------------------------------------------------------------------------------
----------

.------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 11.30-11.45
I
 I   B-AC      2.00      8.15    0.245                0.3    0.3        4.7
I
 I   C-AB      0.28     12.86    0.022                0.0    0.0        0.4
I
 I   C-A       4.15
I
 I   A-B       1.24
I
 I   A-C       4.15
I
 I
I
 ------------------------------------------------------------------------------------------
----------

.------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 11.45-12.00
I
 I   B-AC      1.90      8.25    0.230                0.3    0.3        4.6
I
```

```
 I   C-AB      0.26     12.80    0.020                0.0    0.0        0.4
I
 I   C-A       3.96
I
 I   A-B       1.18
I
 I   A-C       3.95
I
 I
I
 ------------------------------------------------------------------------------------------
----------

 *WARNING* NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR
.
 QUEUE FOR STREAM   B-AC
 -------------------------
 TIME SEGMENT    NO. OF
   ENDING      VEHICLES
               IN QUEUE
   11.15           0.3
   11.30           0.3
   11.45           0.3
   12.00           0.3
.
 QUEUE FOR STREAM   C-AB
 -------------------------
 TIME SEGMENT    NO. OF
   ENDING      VEHICLES
               IN QUEUE
   11.15           0.0
   11.30           0.0
   11.45           0.0
   12.00           0.0
.
                QUEUEING DELAY INFORMATION OVER WHOLE PERIOD
                --------------------------------------------

 ------------------------------------------------------------------------------
 I STREAM I   TOTAL DEMAND  I   * QUEUEING *      I * INCLUSIVE QUEUEING * I
 I        I                 I    * DELAY *        I       * DELAY *        I
 I        I-----------------------------------------------------------------I
 I        I  (VEH)   (VEH/H) I  (MIN)     (MIN/VEH) I    (MIN)      (MIN/VEH) I
 ------------------------------------------------------------------------------
 I  B-AC  I  114.2 I  114.2 I    17.6 I    0.15   I      17.6  I    0.15   I
 I  C-AB  I   15.7 I   15.7 I     1.5 I    0.09   I       1.5  I    0.09   I
 I  C-A   I  237.5 I  237.5 I         I           I            I           I
 I  A-B   I   71.0 I   71.0 I         I           I            I           I
 I  A-C   I  237.0 I  237.0 I         I           I            I           I
 ------------------------------------------------------------------------------
 I  ALL   I  675.3 I  675.3 I    19.1 I    0.03   I      19.1  I    0.03   I
 ------------------------------------------------------------------------------


 * DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
 * INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING 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.



 END OF JOB

 ****** PICADY 4 run completed.
============================================= end of file
=============================================
```

```
                                TRL LIMITED

                            (C) COPYRIGHT 2001

   CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

                          PICADY 4.1  ANALYSIS PROGRAM
                             RELEASE 4.0 (NOV 2003)

                    ADAPTED FROM PICADY/3 WHICH IS CROWN COPYRIGHT
                       BY PERMISSION OF THE CONTROLLER OF HMSO

               ------------------------------------------------------
                      FOR SALES AND DISTRIBUTION INFORMATION,
                      PROGRAM ADVICE AND MAINTENANCE CONTACT:
                                TRL SOFTWARE BUREAU
                     TEL: CROWTHORNE (01344) 770758, FAX: 770864
                           EMAIL: SoftwareBureau@trl.co.uk
               ------------------------------------------------------


 THE USER OF THIS COMPUTER PROGRAM FOR THE SOLUTION OF AN ENGINEERING PROBLEM IS
 IN NO WAY  RELIEVED OF HIS RESPONSIBILITY  FOR THE CORRECTNESS  OF THE SOLUTION


 Run with file:- "C:\21336 Hudson Bay\21583WPPY06.vpi" (drive-on-the-left ) at 14:51:25
on Thursday, 6 August 2020

  RUN TITLE
  *********
  Golf Course Road/Newport Road - 2027 AM Peak With Proposed Development


 .MAJOR/MINOR JUNCTION CAPACITY AND DELAY
  ***************************************

  INPUT DATA
  ----------

                     MAJOR ROAD (ARM C) ---------------------- MAJOR ROAD (ARM A)
                                                I
                                                I
                                                I
                                                I
                                                I
                                                I
                                           MINOR ROAD (ARM B)

 ARM A IS N59 Newport Road Southeast
 ARM B IS L1802 Golf Course Road
 ARM C IS N59 Newport Road Northwest


 STREAM LABELLING CONVENTION
 ---------------------------

        STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

        STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C

        ETC.



 .GEOMETRIC DATA
  --------------


 ------------------------------------------------------------------
 I                DATA ITEM                 I   MINOR ROAD B    I
```

```
 ------------------------------------------------------------------
 I  TOTAL MAJOR ROAD CARRIAGEWAY WIDTH      I ( W  )  6.60 M.   I
 I  CENTRAL RESERVE WIDTH                   I (WCR )  0.00 M.   I
 I                                          I                   I
 I  MAJOR ROAD RIGHT TURN - WIDTH           I (WC-B)  2.20 M.   I
 I                        - VISIBILITY      I (VC-B) 210.0 M.   I
 I                        - BLOCKS TRAFFIC  I         YES       I
 I                                          I                   I
 I  MINOR ROAD - VISIBILITY TO LEFT         I (VB-C) 120.0 M.   I
 I             - VISIBILITY TO RIGHT        I (VB-A) 120.0 M.   I
 I             - LANE 1 WIDTH               I (WB-C)  3.50 M.   I
 I             - LANE 2 WIDTH               I (WB-A)  0.00 M.   I
 ------------------------------------------------------------------
```

.

.TRAFFIC DEMAND DATA

```
 TIME PERIOD BEGINS 11.00 AND ENDS 12.00

 LENGTH OF TIME PERIOD  -  60   MINUTES.
 LENGTH OF TIME SEGMENT -  15   MINUTES.

 DEMAND FLOW PROFILES ARE INPUT DIRECTLY.
.
 ------------------------------------------------------------
 I                   I         TURNING PROPORTIONS        I
 I                   I         TURNING COUNTS             I
 I                   I        (PERCENTAGE OF H.V.S)       I
 I                   ------------------------------------
 I        TIME       I FROM/TO I  ARM A I  ARM B I  ARM C I
 ------------------------------------------------------------
 I   11.00 - 12.00   I         I        I        I        I
 I                   I  ARM A  I  0.000 I  0.255 I  0.745 I
 I                   I         I    0.0 I   81.0 I  237.0 I
 I                   I         I (  0.0)I (  0.0)I (  4.2)I
 I                   I         I        I        I        I
 I                   I  ARM B  I  0.895 I  0.000 I  0.105 I
 I                   I         I  128.0 I    0.0 I   15.0 I
 I                   I         I (  0.8)I (  0.0)I (  0.0)I
 I                   I         I        I        I        I
 I                   I  ARM C  I  0.949 I  0.051 I  0.000 I
 I                   I         I  242.0 I   13.0 I    0.0 I
 I                   I         I (  2.1)I (  0.0)I (  0.0)I
 I                   I         I        I        I        I
 ------------------------------------------------------------

 TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

 THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

.-------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 11.00-11.15
I
 I   B-AC      2.26      8.33    0.271                0.0    0.4        5.2
I
 I   C-AB      0.29     12.69    0.023                0.0    0.0        0.4
I
 I   C-A       3.75
I
```

```
 I   A-B       1.28
I
 I   A-C       3.76
I
 I
I
 ------------------------------------------------------------------------------------------
----------

.------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 11.15-11.30
I
 I   B-AC      2.38      8.23    0.289                0.4    0.4        5.9
I
 I   C-AB      0.31     12.76    0.024                0.0    0.0        0.5
I
 I   C-A       3.94
I
 I   A-B       1.35
I
 I   A-C       3.95
I
 I
I
 ------------------------------------------------------------------------------------------
----------

.------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 11.30-11.45
I
 I   B-AC      2.50      8.13    0.308                0.4    0.4        6.4
I
 I   C-AB      0.33     12.82    0.026                0.0    0.0        0.5
I
 I   C-A       4.13
I
 I   A-B       1.42
I
 I   A-C       4.15
I
 I
I
 ------------------------------------------------------------------------------------------
----------

.------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 11.45-12.00
I
 I   B-AC      2.38      8.23    0.289                0.4    0.4        6.3
I
```

```
 I   C-AB      0.31     12.76    0.024                0.0    0.0        0.5
I
 I   C-A       3.94
I
 I   A-B       1.35
I
 I   A-C       3.95
I
 I
I
 ------------------------------------------------------------------------------------------
----------

 *WARNING* NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR
.
 QUEUE FOR STREAM   B-AC
 -------------------------
 TIME SEGMENT    NO. OF
   ENDING      VEHICLES
               IN QUEUE
   11.15           0.4
   11.30           0.4
   11.45           0.4
   12.00           0.4
.
 QUEUE FOR STREAM   C-AB
 -------------------------
 TIME SEGMENT    NO. OF
   ENDING      VEHICLES
               IN QUEUE
   11.15           0.0
   11.30           0.0
   11.45           0.0
   12.00           0.0
.
                QUEUEING DELAY INFORMATION OVER WHOLE PERIOD
                --------------------------------------------

 ------------------------------------------------------------------------
 I STREAM I   TOTAL DEMAND  I   * QUEUEING *      I * INCLUSIVE QUEUEING * I
 I        I                 I    * DELAY *        I       * DELAY *        I
 I        I-----------------------------------------------------------------I
 I        I  (VEH)   (VEH/H) I  (MIN)     (MIN/VEH) I    (MIN)      (MIN/VEH) I
 ------------------------------------------------------------------------
 I  B-AC  I  142.8 I  142.8 I    23.9 I    0.17   I      23.9  I    0.17   I
 I  C-AB  I   18.6 I   18.6 I     1.8 I    0.10   I       1.8  I    0.10   I
 I  C-A   I  236.4 I  236.4 I         I           I            I           I
 I  A-B   I   81.0 I   81.0 I         I           I            I           I
 I  A-C   I  237.1 I  237.1 I         I           I            I           I
 ------------------------------------------------------------------------
 I  ALL   I  716.0 I  716.0 I    25.7 I    0.04   I      25.7  I    0.04   I
 ------------------------------------------------------------------------


 * DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
 * INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING 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.



 END OF JOB

 ****** PICADY 4 run completed.
============================================= end of file
=============================================
```

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

PICADY 4.1 ANALYSIS PROGRAM
RELEASE 4.0 (NOV 2003)

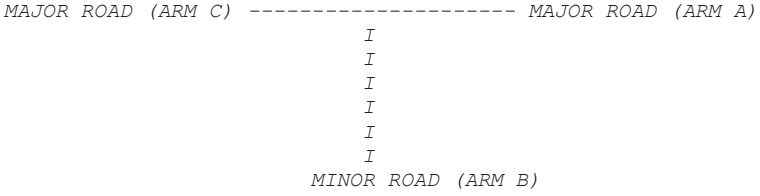
FOR SALES AND DISTRIBUTION INFORMATION,
PROGRAM ADVICE AND MAINTENANCE CONTACT:
TRL SOFTWARE BUREAU
TEL: CROWTHORNE (01344) 770758, FAX: 770864
EMAIL: SoftwareBureau@trl.co.uk

Run with file:- "C:\21336 Hudson Bay\21583WPPY07.vpi" (drive-on-the-left) at 14:54:24 on Thursday, 6 August 2020

RUN TITLE
****
Golf Course Road/Newport Road - 2027 PM Peak Without Proposed Development

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY

INPUT DATA



ARM A IS N59 Newport Road Southeast
ARM B IS L1802 Golf Course Road
ARM C IS N59 Newport Road Northwest

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C

ETC.

.GEOMETRIC DATA

DATA ITEM	MINOR ROAD B

```
 ------------------------------------------------------------------
 I  TOTAL MAJOR ROAD CARRIAGEWAY WIDTH      I ( W  )  6.60 M.   I
 I  CENTRAL RESERVE WIDTH                   I (WCR )  0.00 M.   I
 I                                          I                   I
 I  MAJOR ROAD RIGHT TURN - WIDTH           I (WC-B)  2.20 M.   I
 I                        - VISIBILITY      I (VC-B) 210.0 M.   I
 I                        - BLOCKS TRAFFIC  I         YES       I
 I                                          I                   I
 I  MINOR ROAD - VISIBILITY TO LEFT         I (VB-C) 120.0 M.   I
 I             - VISIBILITY TO RIGHT        I (VB-A) 120.0 M.   I
 I             - LANE 1 WIDTH               I (WB-C)  3.50 M.   I
 I             - LANE 2 WIDTH               I (WB-A)  0.00 M.   I
 ------------------------------------------------------------------
```

.

.TRAFFIC DEMAND DATA

```
 TIME PERIOD BEGINS 17.00 AND ENDS 18.00

 LENGTH OF TIME PERIOD  -  60   MINUTES.
 LENGTH OF TIME SEGMENT -  15   MINUTES.

 DEMAND FLOW PROFILES ARE INPUT DIRECTLY.
.
 ------------------------------------------------------------
 I                    I         TURNING PROPORTIONS        I
 I                    I         TURNING COUNTS             I
 I                    I        (PERCENTAGE OF H.V.S)       I
 I                    ------------------------------------
 I        TIME        I FROM/TO I  ARM A I  ARM B I  ARM C I
 ------------------------------------------------------------
 I   17.00 - 18.00    I         I        I        I        I
 I                    I  ARM A  I  0.000 I  0.297 I  0.703 I
 I                    I         I    0.0 I  102.0 I  242.0 I
 I                    I         I (  0.0)I (  1.0)I (  2.1)I
 I                    I         I        I        I        I
 I                    I  ARM B  I  0.866 I  0.000 I  0.134 I
 I                    I         I   71.0 I    0.0 I   11.0 I
 I                    I         I (  0.0)I (  0.0)I (  0.0)I
 I                    I         I        I        I        I
 I                    I  ARM C  I  0.952 I  0.048 I  0.000 I
 I                    I         I  237.0 I   12.0 I    0.0 I
 I                    I         I (  4.2)I (  0.0)I (  0.0)I
 I                    I         I        I        I        I
 ------------------------------------------------------------

 TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

 THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

.-------------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 17.00-17.15
I
 I   B-AC      1.30      8.43    0.154                0.0    0.2        2.6
I
 I   C-AB      0.27     12.54    0.021                0.0    0.0        0.4
I
 I   C-A       3.67
I
```

```
 I   A-B       1.62
I
 I   A-C       3.83
I
 I
I
 ------------------------------------------------------------------------------------------
----------

.------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 17.15-17.30
I
 I   B-AC      1.37      8.32    0.165                0.2    0.2        2.9
I
 I   C-AB      0.29     12.60    0.023                0.0    0.0        0.4
I
 I   C-A       3.86
I
 I   A-B       1.70
I
 I   A-C       4.03
I
 I
I
 ------------------------------------------------------------------------------------------
----------

.------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 17.30-17.45
I
 I   B-AC      1.44      8.22    0.175                0.2    0.2        3.1
I
 I   C-AB      0.31     12.65    0.024                0.0    0.0        0.5
I
 I   C-A       4.05
I
 I   A-B       1.78
I
 I   A-C       4.24
I
 I
I
 ------------------------------------------------------------------------------------------
----------

.------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 17.45-18.00
I
 I   B-AC      1.37      8.32    0.165                0.2    0.2        3.0
I
```

```
 I   C-AB      0.29     12.60    0.023                0.0    0.0        0.4
I
 I   C-A       3.86
I
 I   A-B       1.70
I
 I   A-C       4.03
I
 I
I
 ------------------------------------------------------------------------------------------
----------

 *WARNING* NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR
.
 QUEUE FOR STREAM   B-AC
 -------------------------
 TIME SEGMENT    NO. OF
   ENDING      VEHICLES
               IN QUEUE
   17.15           0.2
   17.30           0.2
   17.45           0.2
   18.00           0.2
.
 QUEUE FOR STREAM   C-AB
 -------------------------
 TIME SEGMENT    NO. OF
   ENDING      VEHICLES
               IN QUEUE
   17.15           0.0
   17.30           0.0
   17.45           0.0
   18.00           0.0
.
                QUEUEING DELAY INFORMATION OVER WHOLE PERIOD
                --------------------------------------------

 ------------------------------------------------------------------------------
 I STREAM I   TOTAL DEMAND  I   * QUEUEING *      I * INCLUSIVE QUEUEING * I
 I        I                 I    * DELAY *        I       * DELAY *        I
 I        I-----------------------------------------------------------------I
 I        I  (VEH)   (VEH/H) I  (MIN)     (MIN/VEH) I    (MIN)      (MIN/VEH) I
 ------------------------------------------------------------------------------
 I  B-AC  I   82.2 I   82.2 I    11.6 I    0.14   I      11.6  I    0.14   I
 I  C-AB  I   17.1 I   17.1 I     1.7 I    0.10   I       1.7  I    0.10   I
 I  C-A   I  231.9 I  231.9 I         I           I            I           I
 I  A-B   I  102.0 I  102.0 I         I           I            I           I
 I  A-C   I  242.0 I  242.0 I         I           I            I           I
 ------------------------------------------------------------------------------
 I  ALL   I  675.2 I  675.2 I    13.3 I    0.02   I      13.3  I    0.02   I
 ------------------------------------------------------------------------------


 * DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
 * INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING 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.



 END OF JOB

 ****** PICADY 4 run completed.
============================================= end of file
=============================================
```

```
                                TRL LIMITED

                            (C) COPYRIGHT 2001

   CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

                          PICADY 4.1  ANALYSIS PROGRAM
                             RELEASE 4.0 (NOV 2003)

                      ADAPTED FROM PICADY/3 WHICH IS CROWN COPYRIGHT
                         BY PERMISSION OF THE CONTROLLER OF HMSO

                ------------------------------------------------------
                       FOR SALES AND DISTRIBUTION INFORMATION,
                       PROGRAM ADVICE AND MAINTENANCE CONTACT:
                                 TRL SOFTWARE BUREAU
                          TEL: CROWTHORNE (01344) 770758, FAX: 770864
                                EMAIL: SoftwareBureau@trl.co.uk
                ------------------------------------------------------


 THE USER OF THIS COMPUTER PROGRAM FOR THE SOLUTION OF AN ENGINEERING PROBLEM IS
 IN NO WAY  RELIEVED OF HIS RESPONSIBILITY  FOR THE CORRECTNESS  OF THE SOLUTION


 Run with file:- "C:\21336 Hudson Bay\21583WPPY08.vpi" (drive-on-the-left ) at 14:58:02
on Thursday, 6 August 2020

  RUN TITLE
  *********
  Golf Course Road/Newport Road - 2027 PM Peak With Proposed Development


 .MAJOR/MINOR JUNCTION CAPACITY AND DELAY
  ****************************************

  INPUT DATA
  ----------

                     MAJOR ROAD (ARM C) ---------------------- MAJOR ROAD (ARM A)
                                                 I
                                                 I
                                                 I
                                                 I
                                                 I
                                                 I
                                            MINOR ROAD (ARM B)

 ARM A IS N59 Newport Road Southeast
 ARM B IS L1802 Golf Course Road
 ARM C IS N59 Newport Road Northwest


 STREAM LABELLING CONVENTION
 ---------------------------

        STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

        STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C

        ETC.



 .GEOMETRIC DATA
  --------------


 ------------------------------------------------------------------
 I                DATA ITEM                 I   MINOR ROAD B    I
```

```
 ------------------------------------------------------------------
 I  TOTAL MAJOR ROAD CARRIAGEWAY WIDTH      I ( W  )  6.60 M.   I
 I  CENTRAL RESERVE WIDTH                   I (WCR )  0.00 M.   I
 I                                          I                   I
 I  MAJOR ROAD RIGHT TURN - WIDTH           I (WC-B)  2.20 M.   I
 I                        - VISIBILITY      I (VC-B) 210.0 M.   I
 I                        - BLOCKS TRAFFIC  I         YES       I
 I                                          I                   I
 I  MINOR ROAD - VISIBILITY TO LEFT         I (VB-C) 120.0 M.   I
 I             - VISIBILITY TO RIGHT        I (VB-A) 120.0 M.   I
 I             - LANE 1 WIDTH               I (WB-C)  3.50 M.   I
 I             - LANE 2 WIDTH               I (WB-A)  0.00 M.   I
 ------------------------------------------------------------------
```

.

.TRAFFIC DEMAND DATA

```
 TIME PERIOD BEGINS 17.00 AND ENDS 18.00

 LENGTH OF TIME PERIOD  -  60   MINUTES.
 LENGTH OF TIME SEGMENT -  15   MINUTES.

 DEMAND FLOW PROFILES ARE INPUT DIRECTLY.
.
 ------------------------------------------------------------
 I                    I         TURNING PROPORTIONS        I
 I                    I         TURNING COUNTS             I
 I                    I        (PERCENTAGE OF H.V.S)       I
 I                    ------------------------------------
 I        TIME        I FROM/TO I  ARM A I  ARM B I  ARM C I
 ------------------------------------------------------------
 I   17.00 - 18.00    I         I        I        I        I
 I                    I  ARM A  I  0.000 I  0.346 I  0.654 I
 I                    I         I    0.0 I  128.0 I  242.0 I
 I                    I         I (  0.0)I (  0.8)I (  2.1)I
 I                    I         I        I        I        I
 I                    I  ARM B  I  0.862 I  0.000 I  0.138 I
 I                    I         I   81.0 I    0.0 I   13.0 I
 I                    I         I (  0.0)I (  0.0)I (  0.0)I
 I                    I         I        I        I        I
 I                    I  ARM C  I  0.940 I  0.060 I  0.000 I
 I                    I         I  237.0 I   15.0 I    0.0 I
 I                    I         I (  4.2)I (  0.0)I (  0.0)I
 I                    I         I        I        I        I
 ------------------------------------------------------------

 TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

 THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

.-------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 17.00-17.15
I
 I   B-AC      1.49      8.37    0.178                0.0    0.2        3.1
I
 I   C-AB      0.33     12.44    0.027                0.0    0.0        0.5
I
 I   C-A       3.66
I
```

```
 I   A-B       2.03
I
 I   A-C       3.83
I
 I
I
 ------------------------------------------------------------------------------------------
----------

.------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 17.15-17.30
I
 I   B-AC      1.57      8.27    0.190                0.2    0.2        3.4
I
 I   C-AB      0.36     12.50    0.029                0.0    0.0        0.6
I
 I   C-A       3.84
I
 I   A-B       2.13
I
 I   A-C       4.04
I
 I
I
 ------------------------------------------------------------------------------------------
----------

.------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 17.30-17.45
I
 I   B-AC      1.65      8.16    0.202                0.2    0.3        3.7
I
 I   C-AB      0.38     12.55    0.031                0.0    0.0        0.6
I
 I   C-A       4.03
I
 I   A-B       2.24
I
 I   A-C       4.24
I
 I
I
 ------------------------------------------------------------------------------------------
----------

.------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 17.45-18.00
I
 I   B-AC      1.57      8.27    0.190                0.3    0.2        3.6
I
```

```
 I   C-AB      0.36     12.50    0.029                0.0    0.0        0.6
I
 I   C-A       3.84
I
 I   A-B       2.13
I
 I   A-C       4.04
I
 I
I
 ------------------------------------------------------------------------------------------
----------

 *WARNING* NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR
.
 QUEUE FOR STREAM   B-AC
 -------------------------
 TIME SEGMENT    NO. OF
   ENDING      VEHICLES
               IN QUEUE
   17.15           0.2
   17.30           0.2
   17.45           0.3
   18.00           0.2
.
 QUEUE FOR STREAM   C-AB
 -------------------------
 TIME SEGMENT    NO. OF
   ENDING      VEHICLES
               IN QUEUE
   17.15           0.0
   17.30           0.0
   17.45           0.0
   18.00           0.0
.
                QUEUEING DELAY INFORMATION OVER WHOLE PERIOD
                --------------------------------------------

 ------------------------------------------------------------------------------
 I STREAM I   TOTAL DEMAND  I   * QUEUEING *      I * INCLUSIVE QUEUEING * I
 I        I                 I    * DELAY *        I       * DELAY *        I
 I        I-----------------------------------------------------------------I
 I        I  (VEH)   (VEH/H) I  (MIN)     (MIN/VEH) I    (MIN)      (MIN/VEH) I
 ------------------------------------------------------------------------------
 I  B-AC  I   94.2 I   94.2 I    13.8 I    0.15   I      13.8  I    0.15   I
 I  C-AB  I   21.5 I   21.5 I     2.2 I    0.10   I       2.2  I    0.10   I
 I  C-A   I  230.5 I  230.5 I         I           I            I           I
 I  A-B   I  128.1 I  128.1 I         I           I            I           I
 I  A-C   I  242.1 I  242.1 I         I           I            I           I
 ------------------------------------------------------------------------------
 I  ALL   I  716.4 I  716.4 I    16.0 I    0.02   I      16.0  I    0.02   I
 ------------------------------------------------------------------------------


 * DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
 * INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING 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.



 END OF JOB

 ****** PICADY 4 run completed.
============================================= end of file
=============================================
```

```
                                TRL LIMITED

                            (C) COPYRIGHT 2001

   CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

                          PICADY 4.1  ANALYSIS PROGRAM
                             RELEASE 4.0 (NOV 2003)

                    ADAPTED FROM PICADY/3 WHICH IS CROWN COPYRIGHT
                       BY PERMISSION OF THE CONTROLLER OF HMSO

               ------------------------------------------------------
                      FOR SALES AND DISTRIBUTION INFORMATION,
                      PROGRAM ADVICE AND MAINTENANCE CONTACT:
                                TRL SOFTWARE BUREAU
                         TEL: CROWTHORNE (01344) 770758, FAX: 770864
                               EMAIL: SoftwareBureau@trl.co.uk
               ------------------------------------------------------


 THE USER OF THIS COMPUTER PROGRAM FOR THE SOLUTION OF AN ENGINEERING PROBLEM IS
 IN NO WAY  RELIEVED OF HIS RESPONSIBILITY  FOR THE CORRECTNESS  OF THE SOLUTION


 Run with file:- "C:\21336 Hudson Bay\21583WPPY09.vpi" (drive-on-the-left ) at 15:01:37
on Thursday, 6 August 2020

  RUN TITLE
  *********
  Golf Course Road/Newport Road - 2037 AM Peak Without Proposed Development


 .MAJOR/MINOR JUNCTION CAPACITY AND DELAY
  ***************************************

  INPUT DATA
  ----------

                     MAJOR ROAD (ARM C) ---------------------- MAJOR ROAD (ARM A)
                                                I
                                                I
                                                I
                                                I
                                                I
                                                I
                                           MINOR ROAD (ARM B)

 ARM A IS N59 Newport Road Southeast
 ARM B IS L1802 Golf Course Road
 ARM C IS N59 Newport Road Northwest


 STREAM LABELLING CONVENTION
 ---------------------------

        STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

        STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C

        ETC.



 .GEOMETRIC DATA
  --------------


 ------------------------------------------------------------------
 I                DATA ITEM                 I   MINOR ROAD B    I
```

```
 ------------------------------------------------------------------
 I  TOTAL MAJOR ROAD CARRIAGEWAY WIDTH      I ( W  )  6.60 M.   I
 I  CENTRAL RESERVE WIDTH                   I (WCR )  0.00 M.   I
 I                                          I                   I
 I  MAJOR ROAD RIGHT TURN - WIDTH           I (WC-B)  2.20 M.   I
 I                        - VISIBILITY      I (VC-B) 210.0 M.   I
 I                        - BLOCKS TRAFFIC  I         YES       I
 I                                          I                   I
 I  MINOR ROAD - VISIBILITY TO LEFT         I (VB-C) 120.0 M.   I
 I             - VISIBILITY TO RIGHT        I (VB-A) 120.0 M.   I
 I             - LANE 1 WIDTH               I (WB-C)  3.50 M.   I
 I             - LANE 2 WIDTH               I (WB-A)  0.00 M.   I
 ------------------------------------------------------------------
```

.

.TRAFFIC DEMAND DATA

```
 TIME PERIOD BEGINS 11.00 AND ENDS 12.00

 LENGTH OF TIME PERIOD  -  60   MINUTES.
 LENGTH OF TIME SEGMENT -  15   MINUTES.

 DEMAND FLOW PROFILES ARE INPUT DIRECTLY.
.
 ------------------------------------------------------------
 I                    I         TURNING PROPORTIONS        I
 I                    I         TURNING COUNTS             I
 I                    I        (PERCENTAGE OF H.V.S)       I
 I                    ------------------------------------
 I        TIME        I FROM/TO I  ARM A I  ARM B I  ARM C I
 ------------------------------------------------------------
 I   11.00 - 12.00    I         I        I        I        I
 I                    I  ARM A  I  0.000 I  0.231 I  0.769 I
 I                    I         I    0.0 I   75.0 I  250.0 I
 I                    I         I (  0.0)I (  0.0)I (  4.8)I
 I                    I         I        I        I        I
 I                    I  ARM B  I  0.900 I  0.000 I  0.100 I
 I                    I         I  108.0 I    0.0 I   12.0 I
 I                    I         I (  1.9)I (  0.0)I (  0.0)I
 I                    I         I        I        I        I
 I                    I  ARM C  I  0.958 I  0.042 I  0.000 I
 I                    I         I  254.0 I   11.0 I    0.0 I
 I                    I         I (  2.4)I (  0.0)I (  0.0)I
 I                    I         I        I        I        I
 ------------------------------------------------------------

 TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

 THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

.-------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 11.00-11.15
I
 I   B-AC      1.90      8.16    0.233                0.0    0.3        4.3
I
 I   C-AB      0.25     12.78    0.019                0.0    0.0        0.3
I
 I   C-A       3.95
I
```

```
 I   A-B       1.19
I
 I   A-C       3.96
I
 I
I
 ------------------------------------------------------------------------------------------
----------

.------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 11.15-11.30
I
 I   B-AC      2.00      8.06    0.248                0.3    0.3        4.8
I
 I   C-AB      0.27     12.85    0.021                0.0    0.0        0.4
I
 I   C-A       4.15
I
 I   A-B       1.25
I
 I   A-C       4.17
I
 I
I
 ------------------------------------------------------------------------------------------
----------

.------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 11.30-11.45
I
 I   B-AC      2.10      7.95    0.264                0.3    0.4        5.2
I
 I   C-AB      0.29     12.91    0.022                0.0    0.0        0.4
I
 I   C-A       4.35
I
 I   A-B       1.31
I
 I   A-C       4.38
I
 I
I
 ------------------------------------------------------------------------------------------
----------

.------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 11.45-12.00
I
 I   B-AC      2.00      8.06    0.248                0.4    0.3        5.1
I
```

```
 I   C-AB      0.27     12.85    0.021                0.0    0.0        0.4
I
 I   C-A       4.15
I
 I   A-B       1.25
I
 I   A-C       4.17
I
 I
I
 ------------------------------------------------------------------------------------------
----------

 *WARNING* NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR
.
 QUEUE FOR STREAM   B-AC
 -------------------------
 TIME SEGMENT    NO. OF
   ENDING      VEHICLES
               IN QUEUE
   11.15           0.3
   11.30           0.3
   11.45           0.4
   12.00           0.3
.
 QUEUE FOR STREAM   C-AB
 -------------------------
 TIME SEGMENT    NO. OF
   ENDING      VEHICLES
               IN QUEUE
   11.15           0.0
   11.30           0.0
   11.45           0.0
   12.00           0.0
.
                QUEUEING DELAY INFORMATION OVER WHOLE PERIOD
                --------------------------------------------

 ------------------------------------------------------------------------------
 I STREAM I   TOTAL DEMAND  I   * QUEUEING *      I * INCLUSIVE QUEUEING * I
 I        I                 I    * DELAY *        I       * DELAY *        I
 I        I-----------------------------------------------------------------I
 I        I  (VEH)   (VEH/H) I  (MIN)     (MIN/VEH) I    (MIN)      (MIN/VEH) I
 ------------------------------------------------------------------------------
 I  B-AC  I  120.0 I  120.0 I    19.4 I    0.16   I      19.4  I    0.16   I
 I  C-AB  I   16.0 I   16.0 I     1.5 I    0.09   I       1.5  I    0.09   I
 I  C-A   I  249.2 I  249.2 I         I           I            I           I
 I  A-B   I   75.0 I   75.0 I         I           I            I           I
 I  A-C   I  250.2 I  250.2 I         I           I            I           I
 ------------------------------------------------------------------------------
 I  ALL   I  710.4 I  710.4 I    20.9 I    0.03   I      20.9  I    0.03   I
 ------------------------------------------------------------------------------


 * DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
 * INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING 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.



 END OF JOB

 ****** PICADY 4 run completed.
============================================= end of file
=============================================
```

```
                                TRL LIMITED

                            (C) COPYRIGHT 2001

   CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

                          PICADY 4.1  ANALYSIS PROGRAM
                             RELEASE 4.0 (NOV 2003)

                    ADAPTED FROM PICADY/3 WHICH IS CROWN COPYRIGHT
                       BY PERMISSION OF THE CONTROLLER OF HMSO

                ------------------------------------------------------
                       FOR SALES AND DISTRIBUTION INFORMATION,
                       PROGRAM ADVICE AND MAINTENANCE CONTACT:
                                 TRL SOFTWARE BUREAU
                         TEL: CROWTHORNE (01344) 770758, FAX: 770864
                              EMAIL: SoftwareBureau@trl.co.uk
                ------------------------------------------------------


 THE USER OF THIS COMPUTER PROGRAM FOR THE SOLUTION OF AN ENGINEERING PROBLEM IS
 IN NO WAY  RELIEVED OF HIS RESPONSIBILITY  FOR THE CORRECTNESS  OF THE SOLUTION


 Run with file:- "C:\21336 Hudson Bay\21583WPPY10.vpi" (drive-on-the-left ) at 15:04:37
on Thursday, 6 August 2020

  RUN TITLE
  *********
  Golf Course Road/Newport Road - 2037 AM Peak With Proposed Development


 .MAJOR/MINOR JUNCTION CAPACITY AND DELAY
  ****************************************

  INPUT DATA
  ----------

                     MAJOR ROAD (ARM C) ---------------------- MAJOR ROAD (ARM A)
                                                I
                                                I
                                                I
                                                I
                                                I
                                                I
                                           MINOR ROAD (ARM B)

 ARM A IS N59 Newport Road Southeast
 ARM B IS L1802 Golf Course Road
 ARM C IS N59 Newport Road Northwest


 STREAM LABELLING CONVENTION
 ---------------------------

        STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

        STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C

        ETC.



 .GEOMETRIC DATA
  --------------


 ------------------------------------------------------------------
 I                DATA ITEM                 I   MINOR ROAD B    I
```

```
 ------------------------------------------------------------------
 I  TOTAL MAJOR ROAD CARRIAGEWAY WIDTH      I ( W  )  6.60 M.   I
 I  CENTRAL RESERVE WIDTH                   I (WCR )  0.00 M.   I
 I                                          I                   I
 I  MAJOR ROAD RIGHT TURN - WIDTH           I (WC-B)  2.20 M.   I
 I                        - VISIBILITY      I (VC-B) 210.0 M.   I
 I                        - BLOCKS TRAFFIC  I         YES       I
 I                                          I                   I
 I  MINOR ROAD - VISIBILITY TO LEFT         I (VB-C) 120.0 M.   I
 I             - VISIBILITY TO RIGHT        I (VB-A) 120.0 M.   I
 I             - LANE 1 WIDTH               I (WB-C)  3.50 M.   I
 I             - LANE 2 WIDTH               I (WB-A)  0.00 M.   I
 ------------------------------------------------------------------
```

.

.TRAFFIC DEMAND DATA

```
 TIME PERIOD BEGINS 11.00 AND ENDS 12.00

 LENGTH OF TIME PERIOD  -  60   MINUTES.
 LENGTH OF TIME SEGMENT -  15   MINUTES.

 DEMAND FLOW PROFILES ARE INPUT DIRECTLY.
.
 ------------------------------------------------------------
 I                    I         TURNING PROPORTIONS        I
 I                    I         TURNING COUNTS             I
 I                    I        (PERCENTAGE OF H.V.S)       I
 I                    ------------------------------------
 I        TIME        I FROM/TO I  ARM A I  ARM B I  ARM C I
 ------------------------------------------------------------
 I   11.00 - 12.00    I         I        I        I        I
 I                    I  ARM A  I  0.000 I  0.254 I  0.746 I
 I                    I         I    0.0 I   85.0 I  250.0 I
 I                    I         I (  0.0)I (  0.0)I (  4.8)I
 I                    I         I        I        I        I
 I                    I  ARM B  I  0.899 I  0.000 I  0.101 I
 I                    I         I  134.0 I    0.0 I   15.0 I
 I                    I         I (  1.5)I (  0.0)I (  0.0)I
 I                    I         I        I        I        I
 I                    I  ARM C  I  0.951 I  0.049 I  0.000 I
 I                    I         I  254.0 I   13.0 I    0.0 I
 I                    I         I (  2.4)I (  0.0)I (  0.0)I
 I                    I         I        I        I        I
 ------------------------------------------------------------

 TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

 THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

.-------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 11.00-11.15
I
 I   B-AC      2.36      8.17    0.289                0.0    0.4        5.7
I
 I   C-AB      0.29     12.74    0.023                0.0    0.0        0.4
I
 I   C-A       3.94
I
```

```
 I   A-B       1.34
I
 I   A-C       3.96
I
 I
I
 ------------------------------------------------------------------------------------------
----------

.------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 11.15-11.30
I
 I   B-AC      2.48      8.06    0.308                0.4    0.4        6.4
I
 I   C-AB      0.32     12.81    0.025                0.0    0.0        0.5
I
 I   C-A       4.13
I
 I   A-B       1.42
I
 I   A-C       4.16
I
 I
I
 ------------------------------------------------------------------------------------------
----------

.------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 11.30-11.45
I
 I   B-AC      2.61      7.95    0.328                0.4    0.5        7.1
I
 I   C-AB      0.34     12.87    0.026                0.0    0.0        0.5
I
 I   C-A       4.33
I
 I   A-B       1.49
I
 I   A-C       4.37
I
 I
I
 ------------------------------------------------------------------------------------------
----------

.------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 11.45-12.00
I
 I   B-AC      2.48      8.06    0.308                0.5    0.5        6.9
I
```

```
 I   C-AB      0.32     12.81    0.025                0.0    0.0        0.5
I
 I   C-A       4.13
I
 I   A-B       1.42
I
 I   A-C       4.16
I
 I
I
 ------------------------------------------------------------------------------------------
----------

 *WARNING* NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR
.
 QUEUE FOR STREAM   B-AC
 -------------------------
 TIME SEGMENT    NO. OF
   ENDING      VEHICLES
               IN QUEUE
   11.15           0.4
   11.30           0.4
   11.45           0.5
   12.00           0.5
.
 QUEUE FOR STREAM   C-AB
 -------------------------
 TIME SEGMENT    NO. OF
   ENDING      VEHICLES
               IN QUEUE
   11.15           0.0
   11.30           0.0
   11.45           0.0
   12.00           0.0
.
                QUEUEING DELAY INFORMATION OVER WHOLE PERIOD
                -------------------------------------------

 ------------------------------------------------------------------------------
 I STREAM I   TOTAL DEMAND  I   * QUEUEING *      I * INCLUSIVE QUEUEING * I
 I        I                 I    * DELAY *        I       * DELAY *        I
 I        I-----------------------------------------------------------------I
 I        I  (VEH)   (VEH/H) I  (MIN)     (MIN/VEH) I    (MIN)      (MIN/VEH) I
 ------------------------------------------------------------------------------
 I  B-AC  I  148.9 I  148.9 I    26.1 I    0.18   I      26.1  I    0.18   I
 I  C-AB  I   19.0 I   19.0 I     1.8 I    0.10   I       1.8  I    0.10   I
 I  C-A   I  248.0 I  248.0 I         I           I            I           I
 I  A-B   I   84.9 I   84.9 I         I           I            I           I
 I  A-C   I  249.9 I  249.9 I         I           I            I           I
 ------------------------------------------------------------------------------
 I  ALL   I  750.8 I  750.8 I    27.9 I    0.04   I      27.9  I    0.04   I
 ------------------------------------------------------------------------------


 * DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
 * INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING 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.



 END OF JOB

 ****** PICADY 4 run completed.
============================================= end of file
=============================================
```

TRL LIMITED

(C) COPYRIGHT 2001

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

PICADY 4.1 ANALYSIS PROGRAM
RELEASE 4.0 (NOV 2003)

ADAPTED FROM PICADY/3 WHICH IS CROWN COPYRIGHT
BY PERMISSION OF THE CONTROLLER OF HMSO

FOR SALES AND DISTRIBUTION INFORMATION,
PROGRAM ADVICE AND MAINTENANCE CONTACT:
TRL SOFTWARE BUREAU
TEL: CROWTHORNE (01344) 770758, FAX: 770864
EMAIL: SoftwareBureau@trl.co.uk

THE USER OF THIS COMPUTER PROGRAM FOR THE SOLUTION OF AN ENGINEERING PROBLEM IS IN NO WAY RELIEVED OF HIS RESPONSIBILITY FOR THE CORRECTNESS OF THE SOLUTION

Run with file:- "C:\21336 Hudson Bay\21583WPPY11.vpi" (drive-on-the-left) at 15:08:07 on Thursday, 6 August 2020

RUN TITLE
****
Golf Course Road/Newport Road - 2037 PM Peak Without Proposed Development

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY

INPUT DATA

MAJOR ROAD (ARM C) ---------- MAJOR ROAD (ARM A)
I
I
I
I
I
I
MINOR ROAD (ARM B)

ARM A IS N59 Newport Road Southeast
ARM B IS L1802 Golf Course Road
ARM C IS N59 Newport Road Northwest

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C

ETC.

.GEOMETRIC DATA

I DATA ITEM I MINOR ROAD B I

```
 ------------------------------------------------------------------
 I  TOTAL MAJOR ROAD CARRIAGEWAY WIDTH      I ( W  )  6.60 M.   I
 I  CENTRAL RESERVE WIDTH                   I (WCR )  0.00 M.   I
 I                                          I                   I
 I  MAJOR ROAD RIGHT TURN - WIDTH           I (WC-B)  2.20 M.   I
 I                        - VISIBILITY      I (VC-B) 210.0 M.   I
 I                        - BLOCKS TRAFFIC  I         YES       I
 I                                          I                   I
 I  MINOR ROAD - VISIBILITY TO LEFT         I (VB-C) 120.0 M.   I
 I             - VISIBILITY TO RIGHT        I (VB-A) 120.0 M.   I
 I             - LANE 1 WIDTH               I (WB-C)  3.50 M.   I
 I             - LANE 2 WIDTH               I (WB-A)  0.00 M.   I
 ------------------------------------------------------------------
```

.

.TRAFFIC DEMAND DATA

```
 TIME PERIOD BEGINS 17.00 AND ENDS 18.00

 LENGTH OF TIME PERIOD  -  60   MINUTES.
 LENGTH OF TIME SEGMENT -  15   MINUTES.

 DEMAND FLOW PROFILES ARE INPUT DIRECTLY.
.
 ------------------------------------------------------------
 I                   I         TURNING PROPORTIONS        I
 I                   I         TURNING COUNTS             I
 I                   I        (PERCENTAGE OF H.V.S)       I
 I                   ------------------------------------
 I        TIME       I FROM/TO I  ARM A I  ARM B I  ARM C I
 ------------------------------------------------------------
 I   17.00 - 18.00   I         I        I        I        I
 I                   I  ARM A  I  0.000 I  0.298 I  0.702 I
 I                   I         I    0.0 I  108.0 I  254.0 I
 I                   I         I (  0.0)I (  1.9)I (  2.4)I
 I                   I         I        I        I        I
 I                   I  ARM B  I  0.872 I  0.000 I  0.128 I
 I                   I         I   75.0 I    0.0 I   11.0 I
 I                   I         I (  0.0)I (  0.0)I (  0.0)I
 I                   I         I        I        I        I
 I                   I  ARM C  I  0.954 I  0.046 I  0.000 I
 I                   I         I  250.0 I   12.0 I    0.0 I
 I                   I         I (  4.8)I (  0.0)I (  0.0)I
 I                   I         I        I        I        I
 ------------------------------------------------------------

 TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

 THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

.-------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 17.00-17.15
I
 I   B-AC      1.36      8.31    0.164                0.0    0.2        2.8
I
 I   C-AB      0.27     12.59    0.022                0.0    0.0        0.4
I
 I   C-A       3.88
I
```

```
 I   A-B       1.71
I
 I   A-C       4.02
I
 I
I
 ------------------------------------------------------------------------------------------
----------

.------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 17.15-17.30
I
 I   B-AC      1.43      8.20    0.174                0.2    0.2        3.1
I
 I   C-AB      0.29     12.65    0.023                0.0    0.0        0.4
I
 I   C-A       4.08
I
 I   A-B       1.80
I
 I   A-C       4.23
I
 I
I
 ------------------------------------------------------------------------------------------
----------

.------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 17.30-17.45
I
 I   B-AC      1.50      8.09    0.185                0.2    0.2        3.3
I
 I   C-AB      0.31     12.71    0.025                0.0    0.0        0.5
I
 I   C-A       4.28
I
 I   A-B       1.89
I
 I   A-C       4.44
I
 I
I
 ------------------------------------------------------------------------------------------
----------

.------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 17.45-18.00
I
 I   B-AC      1.43      8.20    0.174                0.2    0.2        3.2
I
```

```
 I   C-AB      0.29     12.65    0.023                0.0    0.0        0.4
I
 I   C-A       4.08
I
 I   A-B       1.80
I
 I   A-C       4.23
I
 I
I
 ------------------------------------------------------------------------------------------
----------

 *WARNING* NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR
.
 QUEUE FOR STREAM   B-AC
 -------------------------
 TIME SEGMENT    NO. OF
   ENDING      VEHICLES
               IN QUEUE
   17.15           0.2
   17.30           0.2
   17.45           0.2
   18.00           0.2
.
 QUEUE FOR STREAM   C-AB
 -------------------------
 TIME SEGMENT    NO. OF
   ENDING      VEHICLES
               IN QUEUE
   17.15           0.0
   17.30           0.0
   17.45           0.0
   18.00           0.0
.
                QUEUEING DELAY INFORMATION OVER WHOLE PERIOD
                --------------------------------------------

 ------------------------------------------------------------------------------
 I STREAM I   TOTAL DEMAND  I   * QUEUEING *      I * INCLUSIVE QUEUEING * I
 I        I                 I    * DELAY *        I       * DELAY *        I
 I        I-----------------------------------------------------------------I
 I        I  (VEH)   (VEH/H) I  (MIN)     (MIN/VEH) I    (MIN)      (MIN/VEH) I
 ------------------------------------------------------------------------------
 I  B-AC  I   85.8 I   85.8 I    12.4 I    0.15   I      12.5  I    0.15   I
 I  C-AB  I   17.5 I   17.5 I     1.7 I    0.10   I       1.7  I    0.10   I
 I  C-A   I  244.7 I  244.7 I         I           I            I           I
 I  A-B   I  107.9 I  107.9 I         I           I            I           I
 I  A-C   I  253.9 I  253.9 I         I           I            I           I
 ------------------------------------------------------------------------------
 I  ALL   I  709.8 I  709.8 I    14.2 I    0.02   I      14.2  I    0.02   I
 ------------------------------------------------------------------------------


 * DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
 * INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING 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.



 END OF JOB

 ****** PICADY 4 run completed.
============================================= end of file
=============================================
```

```
                                TRL LIMITED

                            (C) COPYRIGHT 2001

   CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

                          PICADY 4.1  ANALYSIS PROGRAM
                             RELEASE 4.0 (NOV 2003)

                    ADAPTED FROM PICADY/3 WHICH IS CROWN COPYRIGHT
                       BY PERMISSION OF THE CONTROLLER OF HMSO

               ------------------------------------------------------
                      FOR SALES AND DISTRIBUTION INFORMATION,
                      PROGRAM ADVICE AND MAINTENANCE CONTACT:
                                TRL SOFTWARE BUREAU
                     TEL: CROWTHORNE (01344) 770758, FAX: 770864
                           EMAIL: SoftwareBureau@trl.co.uk
               ------------------------------------------------------


 THE USER OF THIS COMPUTER PROGRAM FOR THE SOLUTION OF AN ENGINEERING PROBLEM IS
 IN NO WAY  RELIEVED OF HIS RESPONSIBILITY  FOR THE CORRECTNESS  OF THE SOLUTION


 Run with file:- "C:\21336 Hudson Bay\21583WPPY12.vpi" (drive-on-the-left ) at 15:23:07
on Thursday, 6 August 2020

  RUN TITLE
  *********
  Golf Course Road/Newport Road - 2037 PM Peak With Proposed Development


 .MAJOR/MINOR JUNCTION CAPACITY AND DELAY
  ***************************************

  INPUT DATA
  ----------

                     MAJOR ROAD (ARM C) ---------------------- MAJOR ROAD (ARM A)
                                                I
                                                I
                                                I
                                                I
                                                I
                                                I
                                           MINOR ROAD (ARM B)

 ARM A IS N59 Newport Road Southeast
 ARM B IS L1802 Golf Course Road
 ARM C IS N59 Newport Road Northwest


 STREAM LABELLING CONVENTION
 ---------------------------

        STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

        STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C

        ETC.



 .GEOMETRIC DATA
  --------------


 ------------------------------------------------------------------
 I                DATA ITEM                 I   MINOR ROAD B    I
```

```
 ------------------------------------------------------------------
 I  TOTAL MAJOR ROAD CARRIAGEWAY WIDTH      I ( W  )  6.60 M.   I
 I  CENTRAL RESERVE WIDTH                   I (WCR )  0.00 M.   I
 I                                          I                   I
 I  MAJOR ROAD RIGHT TURN - WIDTH           I (WC-B)  2.20 M.   I
 I                        - VISIBILITY      I (VC-B) 210.0 M.   I
 I                        - BLOCKS TRAFFIC  I         YES       I
 I                                          I                   I
 I  MINOR ROAD - VISIBILITY TO LEFT         I (VB-C) 120.0 M.   I
 I             - VISIBILITY TO RIGHT        I (VB-A) 120.0 M.   I
 I             - LANE 1 WIDTH               I (WB-C)  3.50 M.   I
 I             - LANE 2 WIDTH               I (WB-A)  0.00 M.   I
 ------------------------------------------------------------------
```

.

.TRAFFIC DEMAND DATA

```
 TIME PERIOD BEGINS 17.00 AND ENDS 18.00

 LENGTH OF TIME PERIOD  -  60   MINUTES.
 LENGTH OF TIME SEGMENT -  15   MINUTES.

 DEMAND FLOW PROFILES ARE INPUT DIRECTLY.
```

.

```
 ------------------------------------------------------------
 I                   I         TURNING PROPORTIONS        I
 I                   I         TURNING COUNTS             I
 I                   I        (PERCENTAGE OF H.V.S)       I
 I                   ---------------------------------------
 I        TIME       I FROM/TO I  ARM A I  ARM B I  ARM C I
 ------------------------------------------------------------
 I   17.00 - 18.00   I         I        I        I        I
 I                   I  ARM A  I  0.000 I  0.345 I  0.655 I
 I                   I         I    0.0 I  134.0 I  254.0 I
 I                   I         I (  0.0)I (  1.5)I (  2.4)I
 I                   I         I        I        I        I
 I                   I  ARM B  I  0.867 I  0.000 I  0.133 I
 I                   I         I   85.0 I    0.0 I   13.0 I
 I                   I         I (  0.0)I (  0.0)I (  0.0)I
 I                   I         I        I        I        I
 I                   I  ARM C  I  0.943 I  0.057 I  0.000 I
 I                   I         I  250.0 I   15.0 I    0.0 I
 I                   I         I (  4.8)I (  0.0)I (  0.0)I
 I                   I         I        I        I        I
 ------------------------------------------------------------

 TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

 THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS
```

.

```
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 17.00-17.15
I
 I   B-AC      1.55      8.25    0.188                0.0    0.2        3.3
I
 I   C-AB      0.34     12.50    0.027                0.0    0.0        0.5
I
 I   C-A       3.86
I
```

```
 I   A-B       2.12
I
 I   A-C       4.02
I
 I
I
 ------------------------------------------------------------------------------------------
----------

.------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 17.15-17.30
I
 I   B-AC      1.63      8.14    0.200                0.2    0.2        3.7
I
 I   C-AB      0.37     12.55    0.029                0.0    0.0        0.6
I
 I   C-A       4.05
I
 I   A-B       2.23
I
 I   A-C       4.24
I
 I
I
 ------------------------------------------------------------------------------------------
----------

.------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 17.30-17.45
I
 I   B-AC      1.71      8.03    0.213                0.2    0.3        3.9
I
 I   C-AB      0.39     12.61    0.031                0.0    0.0        0.6
I
 I   C-A       4.25
I
 I   A-B       2.35
I
 I   A-C       4.45
I
 I
I
 ------------------------------------------------------------------------------------------
----------

.------------------------------------------------------------------------------------------
----------
 I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY
GEOMETRIC DELAYI
 I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/
(VEH.MIN/   I
 I                             (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME
SEGMENT) I
 I 17.45-18.00
I
 I   B-AC      1.63      8.14    0.200                0.3    0.3        3.8
I
```

```
 I   C-AB      0.37     12.55    0.029                0.0    0.0        0.6
I
 I   C-A       4.05
I
 I   A-B       2.23
I
 I   A-C       4.24
I
 I
I
 ------------------------------------------------------------------------------------------
----------

 *WARNING* NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR
.
 QUEUE FOR STREAM   B-AC
 -------------------------
 TIME SEGMENT    NO. OF
   ENDING      VEHICLES
               IN QUEUE
   17.15           0.2
   17.30           0.2
   17.45           0.3
   18.00           0.3
.
 QUEUE FOR STREAM   C-AB
 -------------------------
 TIME SEGMENT    NO. OF
   ENDING      VEHICLES
               IN QUEUE
   17.15           0.0
   17.30           0.0
   17.45           0.0
   18.00           0.0
.
                QUEUEING DELAY INFORMATION OVER WHOLE PERIOD
                --------------------------------------------

 ------------------------------------------------------------------------------
 I STREAM I   TOTAL DEMAND  I   * QUEUEING *      I * INCLUSIVE QUEUEING * I
 I        I                 I    * DELAY *        I       * DELAY *        I
 I        I-----------------------------------------------------------------I
 I        I  (VEH)   (VEH/H) I  (MIN)     (MIN/VEH) I    (MIN)      (MIN/VEH) I
 ------------------------------------------------------------------------------
 I  B-AC  I   97.8 I   97.8 I    14.7 I    0.15   I      14.7  I    0.15   I
 I  C-AB  I   21.9 I   21.9 I     2.3 I    0.10   I       2.3  I    0.10   I
 I  C-A   I  243.3 I  243.3 I         I           I            I           I
 I  A-B   I  134.0 I  134.0 I         I           I            I           I
 I  A-C   I  254.0 I  254.0 I         I           I            I           I
 ------------------------------------------------------------------------------
 I  ALL   I  751.0 I  751.0 I    17.0 I    0.02   I      17.0  I    0.02   I
 ------------------------------------------------------------------------------


 * DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
 * INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING 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.



 END OF JOB

 ****** PICADY 4 run completed.
============================================= end of file
=============================================
```

Malachy Walsh and Partners
Engineering and Environmental Consultants
Cork | Tralee | Limerick | London

Mayo County Council

Proposed Housing Development at Golf Course Road, Westport, County Mayo

Stage 1 Road Safety Audit

Project No.: 21583
Document No.: 6004/Rev.A
Date: September 2020

Mayo County Council

Proposed Housing Development at Golf Course Road, Westport, County Mayo

Stage 1 Road Safety Audit

Project No.	Doc. No.	Rev.	Date	Prepared By	Checked By	Approved By	Status
21583	6004	A	07.08.2020	S Quigley	K Concannon	S Quigley	Draft
21583	6004	A	01.09.2020	S Quigley	K Concannon	S Quigley	Final

Malachy Walsh and Partners, Engineering and Environmental Consultants

Address: Park House, Mahon Technology Park, Bessboro Road, Blackrock, Cork

Malachy Walsh and Partners
Engineering and Environmental Consultants

CONTENTS

1.0 INTRODUCTION

1.1 This report details the findings of a Stage 1 Road Safety Audit carried out on a proposed housing development at Golf Course Road, Westport, County Mayo. The Audit was commissioned by Mayo County Council. Stage 1 is completion of preliminary design.

1.2 This Audit is required by Mayo County Council for the purposes of a Part 8 planning process.

1.3 Malachy Walsh and Partners' Road Safety Auditors carried out the Audit. The Audit Team members were as follows:-

Karen Concannon, BE MSc CEng MIEI	Malachy Walsh and Partners
Seamus Quigley, BE CEng MIEI MCIHT	Malachy Walsh and Partners

1.4 Seamus Quigley inspected the site on the 4th August 2020, between 9.20 a.m. and 10.00 a.m., in daylight, by foot and in a car, during damp weather conditions following rain. Record photographs were taken.

1.5 The proposed housing development site is located on the south side of Golf Course Road, on the north west side of the town centre. Golf Course Road has a priority Stop T-junction on it south west side with the local access road to the Westport House caravan and camping park and Westport United Football Club, on the east side of the site boundary.

1.6 The local access road has a typical road carriageway width of 6.0 metres and a 2.0 metres wide on-carriageway south east side cycle lane with segregating flexible bollards, which links with an off-carriageway cycle facility, locally, on the south west side of Golf Course Road. The local access road has a 2.1 metres wide footway and street lighting standards along its south west side. A kerbed variable width grass verge is provided along the north west (site) side of the local access road. The verge width is circa 3.1 metres at the location of the proposed site access on the local access road.

1.7 Golf Course Road has a typical two-way urban road carriageway width of 7.0 metres in the vicinity of the site, with footways on both sides on the east side of its local access road junction. Street lighting standards are provided along the south west (site) side of Golf Course Road in the vicinity of the site. A circa 2.4 metres wide footway is provided along the north side of Golf Course Road, west of its local access road junction, with local footway widening.

1.8 Road drainage gullies are provided on both sides of Golf Course Road and on the local access road, adjacent to the proposed site.

1.9 A kerbed grass verge is provided along the south west (site) side of Golf Course Road, with variable widths from circa 1.8 metres to circa 4.5 metres at its north west end.

1.10 Traffic calming centrally located road narrowing and speed cushion measures, with alternating Yield one-way traffic, are provided on Golf Course Road, immediately east of its local access road junction and approximately 140 metres on the north west side of the junction. A raised pedestrian crossing facility is provided on Golf Course Road, approximately 100 metres south east of its local access road junction.

1.11 Golf Course Road is part of the L1802 Local Road and forms a priority Stop junction with Newport Road, approximately 450 metres east of the proposed site.

1.12 Between the proposed site and its Newport Road junction, Golf Course Road has multiple accesses for existing residential developments and dwellings. The Bog Field park and playground is located on the south west side of Golf Course Road, on the opposite side of its local access road junction to the proposed site. Two direct pedestrian accesses to The Bog Filed are provided on Golf Course Road, with a third access and adjacent vehicle set down facility provided at the Fairways on its east side. The Bog Field also links with Gaelscoil na Gruaiche on its south side.

1.13 The existing local road network in the vicinity of the proposed site is located within the Westport 50 km/hour urban speed limit zone.

1.14 The proposed housing development includes 50 mixed-size units including 12 two-bedroom units and 38 three-bedroom units.

1.15 Access for the proposed housing development is proposed via two accesses on Golf Course Road and one access on the local access road, south west of the location of the existing site access gate. Separate pedestrian accesses are also proposed on Golf Course Road, at the east end of the site and between the two vehicle accesses.

1.16 The drawings and other documents provided to carry out the Audit are listed in Appendix A.

1.17 This Audit has been carried out in the context of the relevant sections of the TII Road Safety Audit GE-STY-01024 December 2017 and TII Road Safety Audit Guidelines GE-STY-01027 December 2017, in accordance with the Government of Ireland Design Manual for Urban Roads and Streets (Version 1.1) May 2019 (DMURS). The Auditors have examined and reported only on those features of the design considered to have road safety implications and have not examined or verified the compliance of the scheme to any other criteria.

1.18 Section 2 of this report presents the findings of the Stage 1 Road Safety Audit of the proposed housing development at Golf Course Road, Westport, County Mayo. The Designer's Feedback is provided in Appendix B.

2.0 FINDINGS OF THE STAGE 1 ROAD SAFETY AUDIT

NON-MOTORISED USERS

2.1 Problem – No Footways along Site Boundary

There are no footways proposed along the site boundary on the south side of Golf Course Road and west side of the local access road. The existing road edge has kerbed grass verges. Inadequate facilities for pedestrians, including mobility and visually impaired users, generated by the proposed housing could put them at increased risk of trips, falls, vehicle conflicts, collisions and potential injuries.

Recommendation:

Provide appropriate footways, with defined crossing locations at the Golf Course Road junction with the adjacent local road, and at their west and south ends, with footway dishing/drop kerbs and tactile paving, with reference to DMURS and the DoT Traffic Management Guidelines.

Provide appropriate kerb heights along the footways, removing the existing dropped kerb, locally, on the local access road, located north east of the opposite Westport United Football Club access.

2.2 Problem – No Details of Footway Treatments at Crossing Locations

There are no details of dishing/drop kerbs and tactile paving on footways at crossing locations for pedestrians. Inadequate facilities could put pedestrians at risk of trips, falls and consequent injuries, and increased risk of vehicle collisions and potential injuries.

Recommendation:

Provide appropriate footway/dishing/drop kerbs and tactile paving at pedestrian crossing locations, with reference to DMURS and the DoT Traffic Management Guidelines.

2.3 Problem – Extent of Footway Shown Incomplete

The extent of footway for the pedestrian access on Golf Course Road is shown incomplete at its south end and not connected to the internal access road. Inadequate facilities could put pedestrians at risk of trips, falls and consequent injuries, and increased risk of vehicle collisions and potential injuries.

Recommendation:
Provide a footway along the full extent of the expected desire line. Refer also to item 2.2 above.

2.4 Problem – No Details of Footway End Treatments at Golf Course Road and Local Access Road

There are no details of footway end treatments at Golf Course Road and the local access road. There are no footways proposed along the site boundary on the south side of Golf Course Road and west side of the local access road. The existing road edge has kerbed grass verges. Inadequate facilities for pedestrians, including mobility and visually impaired users, generated by the proposed housing could put them at increased risk of trips, falls, vehicle conflicts, collisions and potential injuries.

Recommendation:
Provide appropriate footway end treatments, with reference to DMURS and the DoT Traffic Management Guidelines. Refer also to item 2.1 above.

LAYOUT AND VISIBILITY

2.5 Problem – No Tie-In Radii at Access Road Junctions

There are no horizontal tie-in radii shown at the access road junctions with Golf Course Road and the local access road. Inadequate turning radii could result in vehicle conflicts and collisions, consequent material damage and potential injuries for vehicle occupants.

Recommendation:
Provide appropriate access road junction tie-in radii, with reference to DMURS.

2.6 Problem – Possible Restricted Visibility along Local Access Road

The existing local access road link to the Western House caravan and camping park is not shown on the proposed development layout plan drawing provided for audit. The Western House access gate pillar on the north west (site) side could restrict the forward visibility to the proposed development access junction along the existing access road for north eastbound drivers; and restrict the visibility splay to the south west of the proposed access junction for drivers exiting the proposed development, with reference to DMURS. This could increase the risk of vehicle collisions and consequent injuries for vehicle occupants.

Recommendation:
Check the visibility along the local access road, to and from the proposed access junction, with reference to DMURS. Relocate the access, as required, to ensure appropriate visibility, with appropriate stagger to the existing Westport United Football Club access.

2.7 Problem – No Road and Footway Surface, Edge and Tie-In Details

There are no details of the proposed development road and footway surface and edge materials, and tie-ins. Inappropriate materials and inadequate tie-ins could put users at risk of conflicts, trips and falls, with potential consequent injures.

Recommendation:

Provide appropriate road and footway materials and adequate tie-ins, with reference to DMURS.

2.8 Problem – No Access Road Levels Shown

The proposed gradients for access roads, on approach to Golf Course Road and the local access road, has not been indicated on the drawing provided for audit. The potential hazards are that vehicles may have to approach at too steep a gradient for visibility or braking purposes, or that carriageway falls are insufficient to provide effective surface water drainage, which could result in skidding incidents as vehicles turn or brake resulting in potential injuries to occupants. There may also be an insufficient dwell area for vehicles waiting at the junction, putting them at risk of rolling out on to Golf Course Road and local access road.

Recommendation:

It is recommended that an appropriate dwell area at 1% to 2% gradient, with appropriate cross-falls and drainage, for a minimum of 10 metres should be provided at junctions with Golf Course Road and the local access road.

2.9 Problem – No Internal Road Gradients Shown

The proposed gradients for the internal roads, including internal junction dwell areas, have not been indicated on the drawing provided for audit. The potential hazards are that vehicles may have to approach at too steep a gradient for visibility or braking purposes, or that carriageway falls are insufficient to provide effective surface water drainage, which could result in skidding incidents as vehicles turn or brake resulting in potential injuries to occupants. There may also be an insufficient dwell area for vehicles waiting at junctions, putting them at risk of rolling out on to the internal priority route.

Recommendation:

It is recommended that an appropriate dwell area at 1% to 2% gradient, with appropriate cross-falls and drainage, for a minimum of 10 metres should be provided. Road alignment gradients should be in accordance with gradients outlined in DMURS.

2.10 Problem – Car Parking Spaces Not Shown

The numbers, types (standard/disabled/visitor) and layout of car parking spaces are not shown. Inadequate car parking could result in overspill car parking and potential conflicts with other users.

Recommendation:

Provide appropriate car parking for all expected users.

DRAINAGE

2.11 Problem – No Details of Drainage Gully Locations

There are no details provided for audit of drainage gully locations for the proposed development. Inadequate drainage could result in users diverting to avoid ponding, increasing the risk of conflicts, collisions and injuries. Ice during cold weather could but pedestrians at risk of skidding, falls and injuries. Ice could also result in vehicle skidding during braking.

Recommendation:

Provide adequate drainage.

LANDSCAPING

2.12 Problem – Landscaping Adjacent to Internal Road Junctions and Footways

Landscaping is shown adjacent to internal road junctions, footways and recessed parking areas. Landscaping could potentially restrict visibilities at junctions and along roads, to and for users, increasing the risk of collisions and potential injuries. Landscaping shown extending into footways could restrict footway clear widths resulting in pedestrians stepping out into the road carriageway, putting them at risk of vehicle collisions and consequent injuries.

Recommendation:

Locate landscaping clear of appropriate visibilities and footways.

3.0 AUDIT TEAM STATEMENT

We certify that we have examined the drawings and other information listed in Appendix A of this report. The examination has been carried out for the sole purpose of identifying any features of the design that could be removed or modified in order to improve the safety of the scheme. The problems we have identified are noted in the report, together with suggestions for improvement, which we recommend should be studied for implementation.

Signed: _____ **Date:** 01/09/2020

Karen Concannon, BE MSc CEng MIEI
Audit Team Member
Malachy Walsh and Partners
Consulting Engineers
Park House
Mahon Technology Park
Blackrock
Cork

Signed: _____ **Date:** 01/09/2020

Seamus Quigley, BE CEng MIEI MCIHT
Audit Team Member
For and on behalf of Malachy Walsh and Partners
Engineering and Environmental Consultants
Park House
Mahon Technology Park
Blackrock
Cork

APPENDIX A – LIST OF DOCUMENTS PROVIDED FOR THIS AUDIT

Drawings:-

Architects Department Mayo County Council
Site Location Plan
Drawing No. 5201 *Date: 23.08.2018*

Architects Department Mayo County Council
Site Location Plan
Drawing No. 5202 *Date: 23.08.2018*

Other Documents:-

Malachy Walsh and Partners
Traffic Impact Assessment
Document Number: 21583/6003/Rev.A *Date: 06.08.2020*

APPENDIX B – DESIGNER'S FEEDBACK

ROAD SAFETY AUDIT FEEDBACK FORM

SCHEME: PROPOSED HOUSING DEVELOPMENT AT GOLF COURSE ROAD, WESTPORT, COUNTY MAYO

ROUTE(S): L1802 GOLF COURSE ROAD AND LOCAL ACCESS ROAD

AUDIT STAGE: STAGE 1 **DATE AUDIT COMPLETED:** AUGUST 2020

	To Be Completed By Designer			To Be Completed by Audit Team Leader
Paragraph No. in Safety Audit	**Problem Accepted (Yes/ No)**	**Recommended Measure Accepted (Yes/ No)**	**Describe Alternative Measure(s). Give Reasons for Not Accepting Recommended Measure**	**Alternative Measures Accepted by Auditors (Yes/ No)**
2.1	Yes	Yes	Appropriate footways will be provided, with defined crossing locations, with footway dishing/drop kerbs and tactile paving, with reference to DMURS and the DoT Traffic Management Guidelines. Appropriate kerb heights will be provided along footways.	
2.2	Y	Y	Appropriate footway/dishing/drop kerbs and tactile paving will be provided at pedestrian crossing locations, with reference to DMURS and the DoT Traffic Management Guidelines.	
2.3	Y	Y	A footway shall be provided along the full extent of the expected footway for the pedestrian access on Golf Course Road at its south end and connected to the internal access road.	
2.4	Y	Y	Appropriate footway end treatments shall be provided, with reference to DMURS and the DoT Traffic Management Guidelines.	
2.5	Y	Y	Appropriate access road junction tie-in radii shall be provided, with reference to DMURS.	
2.6	Y	Y	Access will be adjusted, as required, to ensure appropriate visibility, with appropriate stagger to the existing Westport United Football Club access.	
2.7	Y	Y	Appropriate road and footway materials and adequate tie-ins shall be provided, with reference to DMURS.	
2.8	Y	Y	An appropriate dwell area at 1% to 2% gradient, with appropriate cross-falls and drainage, for a minimum of 10 metres shall be provided at junctions with Local area and Golf Course road.	
2.9	Y	Y	An appropriate dwell area at 1% to 2% gradient, with appropriate cross-falls and drainage, for a minimum of 10 metres shall be provided. Road alignment gradients shall be in accordance with gradients outlined in DMURS.	

ROAD SAFETY AUDIT FEEDBACK FORM

	To Be Completed By Designer			To Be Completed by Audit Team Leader
Paragraph No. in Safety Audit	**Problem Accepted (Yes/ No)**	**Recommended Measure Accepted (Yes/ No)**	**Describe Alternative Measure(s). Give Reasons for Not Accepting Recommended Measure**	**Alternative Measures Accepted by Auditors (Yes/ No)**
2.10	Y	Y	Appropriate car parking for all expected users will be provided in line with relevant Development Plan / Building Regulations.	
2.11	Y	Y	Adequate drainage shall be provided including gully locations for the proposed development.	
2.12	Y	Y	All landscaping shall be located clear of appropriate visibilities and footways.	

SIGNED: ..... **DESIGNER** **DATE:** 31.08.20

ON BEHALF OF MIDDLE SOUTH COUNCIL

SIGNED: ..... **AUDIT TEAM LEADER** **DATE:** 01/09/2020

SIGNED: ..... **EMPLOYER** **DATE:** 1.09.20