

Navan Cycle Network

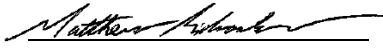
(Athlumney to Trim Road Cycle and Pedestrian Scheme)

Transport Assessment

September 2018

Quality information

Prepared by



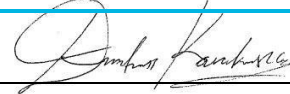
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1. Introduction

1.1 Background

AECOM have been commissioned by Meath County Council to carry out a Transport Assessment in support of the preliminary design of a proposed cycle route in Navan Town. This route will create a network of cycle lanes which will connect residential areas on the outskirts of the town into the town centre.

Navan Town is considered the administrative centre of County Meath and has a population of over 30,000 people from the current Census undertaken in 2016. The town is identified as a Primary Economic Growth Town in the Meath County Development Plan 2013 – 2019 and also has a high level status in the County Retail Strategy. Therefore, Navan Town is, and will be, a particular focus for new developments in the near future in the form of housing, employment, retail and leisure development. With this increase, a natural outcome will be a significant increase in travel demand throughout the town.

The Navan Transport Plan sets out the transport strategy for the town to cover the period 2014 to 2019. The vision for this strategy is to “Provide a safe and sustainable transport network within Navan Town & Environs.” This means that it is an objective of this strategy to provide safe and secure facilities for a transport network that is both environmentally and financially sustainable.

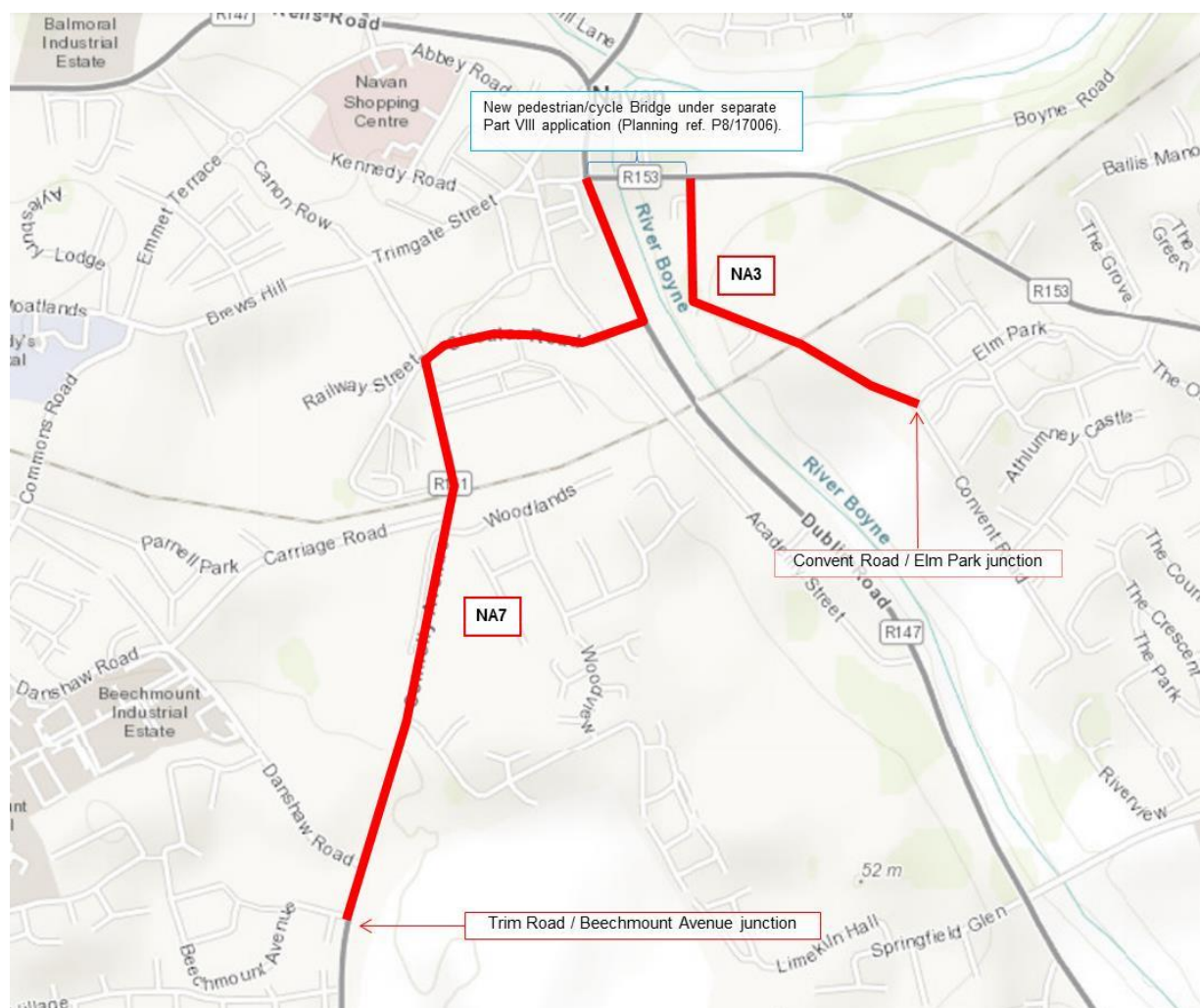


Figure 1.1: Scheme Route

1.2 Planning Context

The delivery of these cycle routes supports a number of national, regional and local planning and policy documents, including the Transport Strategy for the Greater Dublin Area, and Smarter Travel, A Sustainable Transport Future. Their development will provide a combined cycle route as set out in the Greater Dublin Area Cycle Network Plan, and will fulfil objectives and actions in the Navan Transport Plan 2014-2019.

Shown below is an extract from the GDA Cycle Network Plan illustrating the proposed route which overlaps the NA7 and NA3 cycle routes within Navan Town.

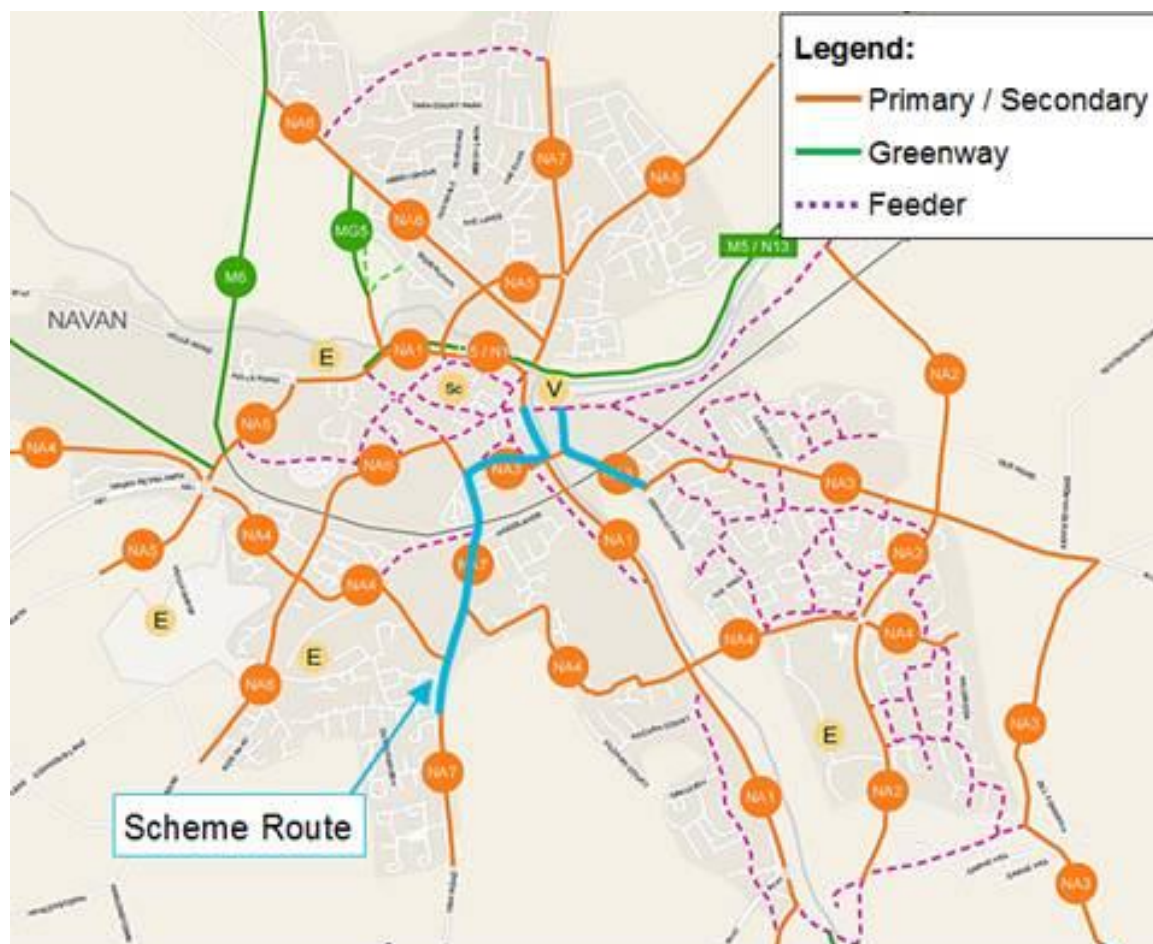


Figure 1.2: GDA Cycle Network Map of Navan

1.3 Objectives

The main objective of this report is to examine the transport impacts of the proposed scheme on the surrounding network within Navan Town. This includes for impacts on vehicular traffic, pedestrians and cyclists.

1.4 Study Methodology

AECOM received the following survey information in order to inform this Transport Assessment:

- Junction Turning Counts (JTC)
- Pedestrian Count Surveys
- Queue Length Surveys
- Car Parking Survey
- Vehicle Journey Time Survey

Junction Turning Counts were undertaken, on Tuesday 20th of October, at a number of relevant junctions that are located along the route of the proposed scheme. These counts are being used to undertake analysis and to determine the impact, if any, that the proposed scheme will have on the junctions.

Pedestrian Count Surveys were also carried out at a number of relevant junctions and key pedestrian locations along the proposed scheme route. This includes for a two – way vehicle, pedestrian and cycle count along Convent Road. These counts will help to determine the current pedestrian activity throughout Navan Town and will inform the preferred design in terms of pedestrian facility upgrades at the junctions.

Queue Length Surveys were undertaken for each junction at 15 minute intervals. The surveys were carried out over a 12 hour period, 07:00 – 19:00.

Car Parking Survey was undertaken along Railway Road and included occupancy, accumulation and duration of stay. The survey included for 16 car parking spaces in total.

Vehicle Journey Time Surveys were carried out at three locations along Trim Road (R161) from Dan Shaw Road to the Circular Road roundabout. This survey was carried out in order to determine the average journey time within this location. With the scheme proposing to alter the Circular Road roundabout, it was necessary to know the actual journey time along the R161 to the current roundabout. Peak period average journey time data (over two weeks) was required in each direction between each site. The data was obtained from 07:30-09:30, 13.00-14.00 and 16:30-18:30 on one day.

2. Existing Traffic Conditions

Existing Conditions

The primary function of this report is to provide an assessment of the impact that the proposed scheme will have on the surrounding transportation network and therefore this chapter includes a review of existing 'baseline' conditions as well as a review of existing pedestrian and cycle conditions.

2.1 Existing Conditions

Existing Road Network

The Navan Town road network is illustrated in Figure 2.1 below.

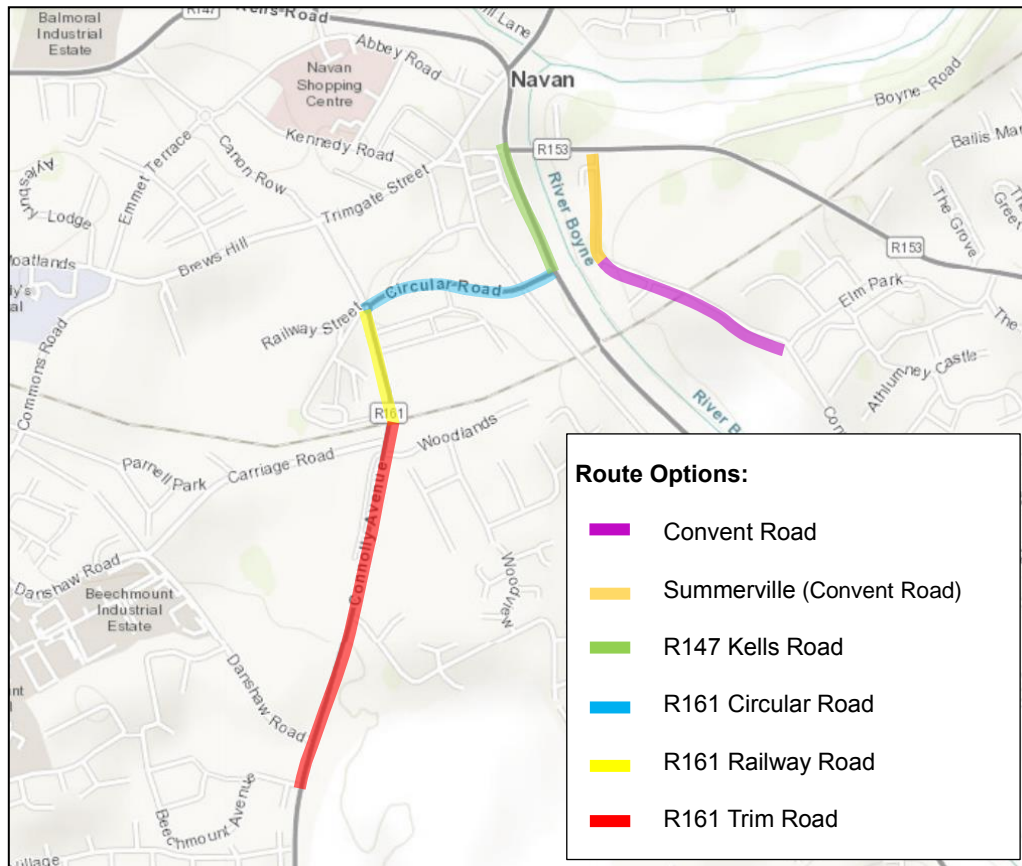


Figure 2.1: Local Area Road Network

R161 Trim Road

The R161, is a regional road between Kinnegad, running north east into Trim and terminating in Navan Town. The section of the R161 in Navan Town is also known as Trim Road. Part of the proposed scheme is located on 750m of the Trim Road from the Beechmount Avenue junction to the railway line. The R161 continues onto Railway Road and Circular Road. It has footpath provision on two sides for a large section of the road. Footpath width varies, however, it is narrow in some sections.



Figure 2.2: R161 Trim Road

R147 Kells Road

The R147, is a regional road. The route is approximately 56km in length. It runs from Clonee, in a north westerly direction, through Dunshaughlin, Navan Town, Kells and terminates at the Meath/Cavan border at the N3 National road.

The section of the R147 within the scheme is 240m in length. There are footpaths on both sides of the road, however these are narrow on both sides. The road is wide and has a total of four lanes.



Figure 2.3: R147 Kells Road

2.2 Collision and Accident Information

The Road Safety Authority (RSA) website was reviewed in order to determine any collisions and accidents that have occurred within the study area of this scheme from 2005 - 2014. Figure 2.4 below illustrates the RSA road accident collisions map for Navan Town for the period of 2005 – 2014.

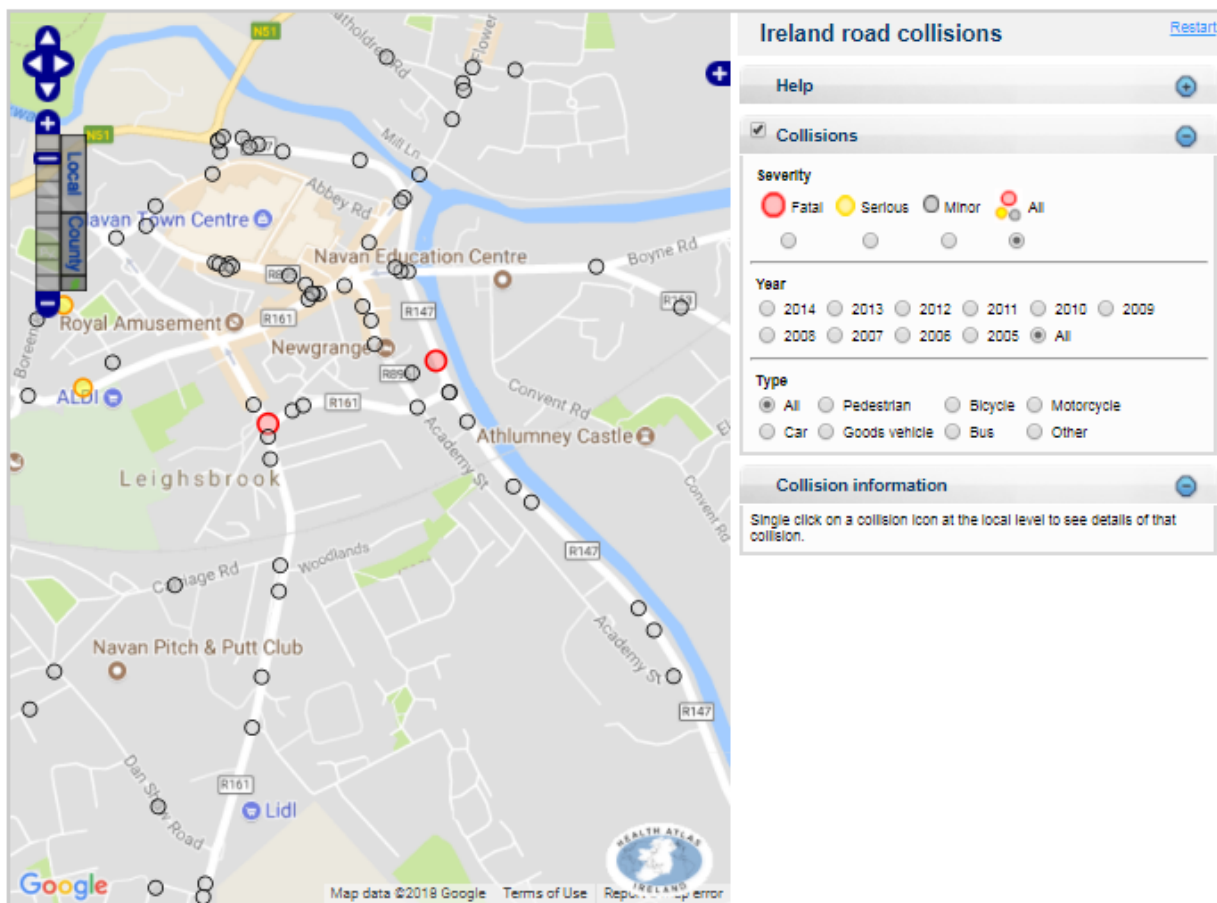


Figure 2.4: Road Accident Collisions (Source: RSA Website)

There have been a total of 15 recorded collisions that have occurred along the proposed route, five of which (33%) have involved pedestrians. There have been no collisions involving cyclists within this time period. The majority of collisions have been minor, however, there have been two fatal collisions. The first of these fatal accidents occurred in 2005 on the R147 and involved a car and pedestrian. The second fatal accident occurred at the Circular Road roundabout in 2007 and also involved a car and pedestrian.

There have been five minor collisions on the Trim Road, two of which involved pedestrians. There has been one fatal and one minor collision at the Circular Road roundabout. There have been three minor collisions on the Circular Road and one at the Circular Road/R147 junction, one of these collisions involved a pedestrian. The fatal collision in 2005 is the only recorded collision between the Circular Road/R147 junction and the R147/Market Square junction. Three minor collisions are recorded at the R147/Market Square junction, none of which involved pedestrians.

Existing Traffic Flows

Traffic flow data was obtained as part of this scheme, as stated previously in Section 1.3; with junction turning counts undertaken at the following junctions;

1. The R161 Trim Road / Dan Shaw Road Junction.
2. R161 Railway Road / R161 Circular Road Junction
3. R147 Kells Road / R161 Circular Road Signal Controlled Junction
4. R147 Kells Road / Kentstown Road / Market Square Junction
5. Athlumney Road / Convent Road Junction.

Trim Road / Dan Shaw Road Junction

Traffic flows were recorded for a 12 hour period with the AM and PM peak hour flows determined as 08:00 – 09:00 and 17:00 – 18:00 respectively. The flow diagrams for the AM and PM peak hour are shown in Figure 2.5 and Figure 2.6.

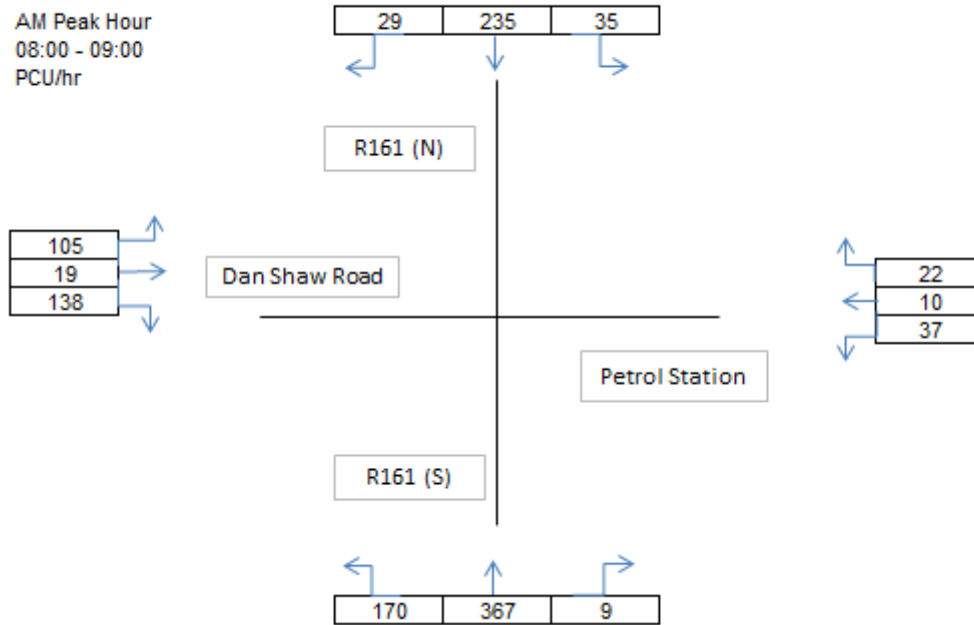


Figure 2.5: AM Peak Hour for the R161 Trim Road / Dan Shaw Road Junction

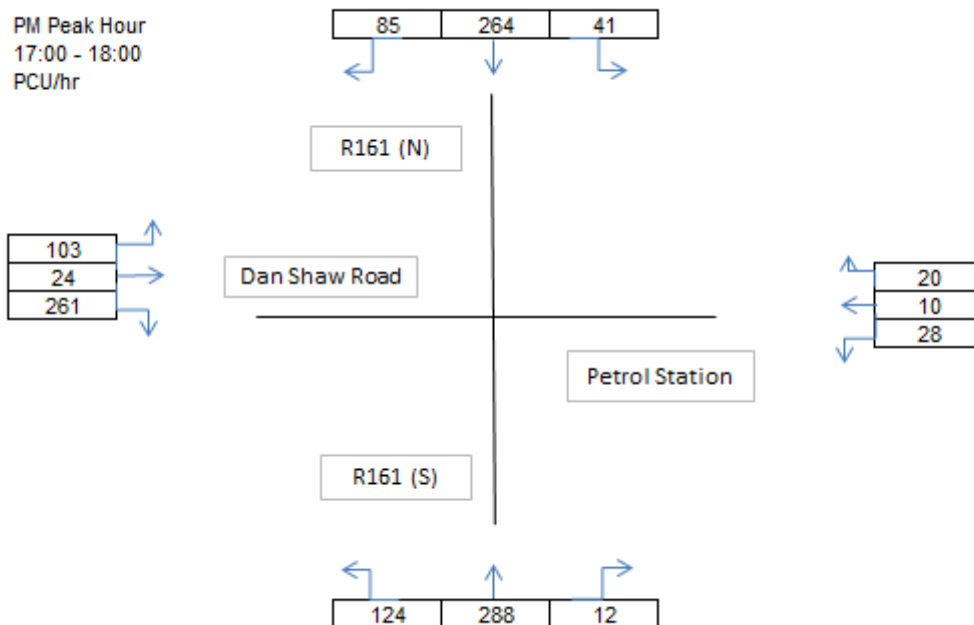


Figure 2.6: PM Peak Hour for the R161 Trim Road / Dan Shaw Junction

It can be seen from the flow diagrams that the predominant peak hour is the PM peak. The total flow through the junction in the AM peak hour is 1176 pcu's and the total flow in the PM peak is 1260 pcu's.

The highest flow in both peak hours is on the R161 (S) arm. In the AM peak, the total flow on this arm is 546 pcu's with the majority of these heading northbound to the R161 (N) arm. In the PM peak, the total flow on the arm is 424 pcu's with the majority of these also heading northbound to the R161 (N) arm.

R161/Circular Road Roundabout

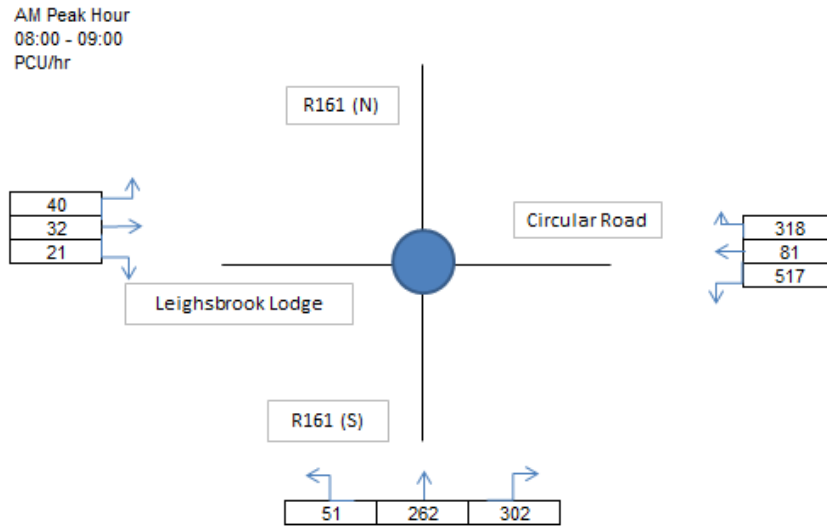


Figure 2.7: AM Peak Hour for the R161 Trim Road / Leighsbrook Lodge / Circular Road roundabout

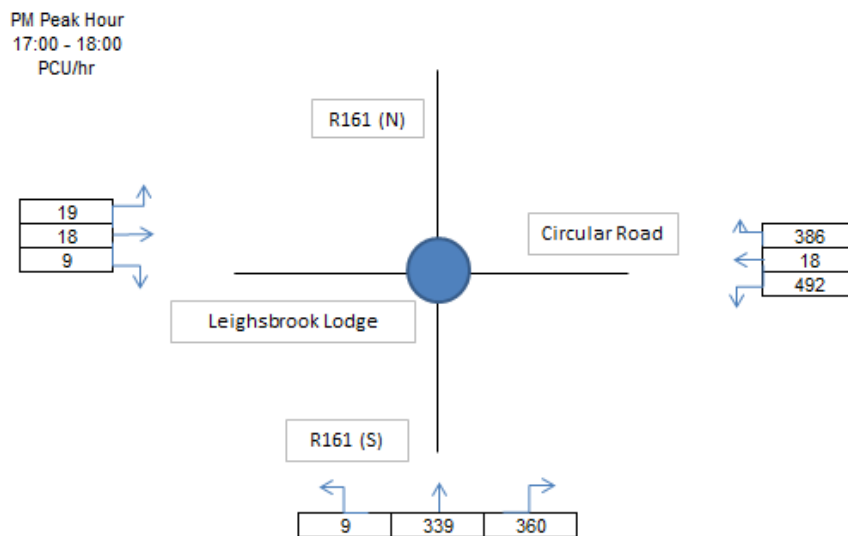


Figure 2.8: PM Peak Hour for the R161 Trim Road / Leighsbrook Lodge / Circular Road roundabout

It can be seen from the flow diagrams that the predominant peak hour is the PM peak. The total flow through the junction in the AM peak hour is 1624 pcu's and the total flow in the PM peak is 1650 pcu's.

The highest flow in both peak hours is on the Circular Road arm. In the AM peak, the total flow on this arm is 916 pcu's with the majority of these heading southbound to the R161 (S) arm. In the PM peak, the total flow on the arm is 896 pcu's with the majority of these also heading southbound to the R161 (S) arm.

R147(N) / Circular Road / R147(S)

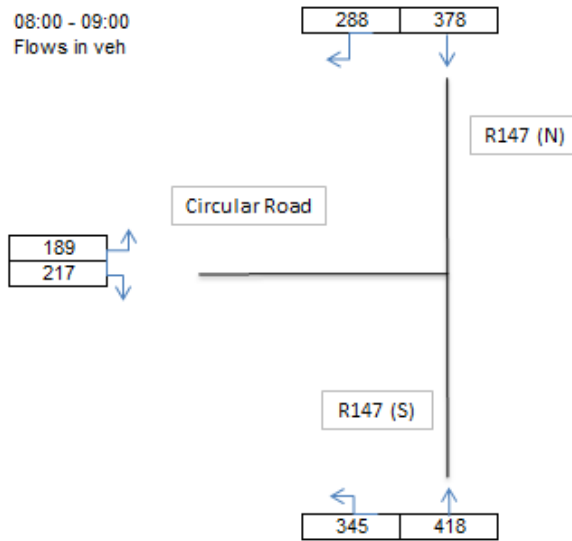


Figure 2.9: AM peak hour turning count diagram for the R147 (N) / Circular Road / R147(S) Junction

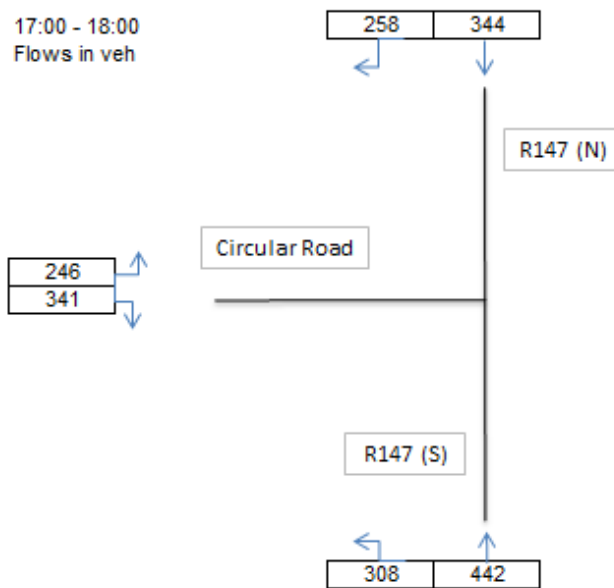


Figure 2.10: PM peak hour turning count diagram for the R147 (N) / Circular Road / R147(S) Junction

It can be seen from the flow diagrams that the predominant peak hour is the PM peak. The total flow through the junction in the AM peak hour is 1835 pcu's and the total flow in the PM peak is 1939 pcu's.

The highest flow in both peak hours is on the R147 (S) arm. In the AM peak, the total flow on this arm is 763 pcu's with the majority of these heading northbound to the R147 (N) arm. In the PM peak, the total flow on the arm is 750pcu's with the majority of these also heading northbound to the R147 (N) arm.

R147(N) / Market Square / R147(S) / R153

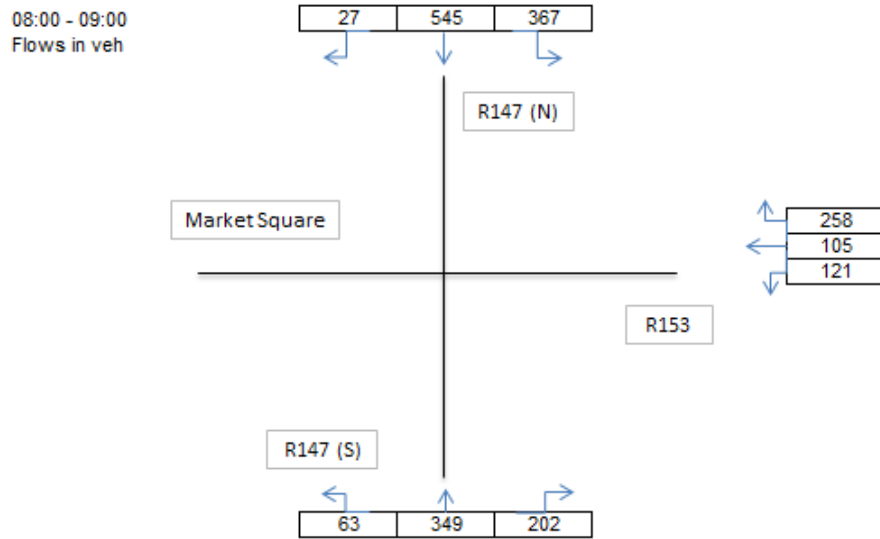


Figure 2.11: AM peak hour turning count diagram for the R147 (N) / Market Square / R147(S) / R153 Junction

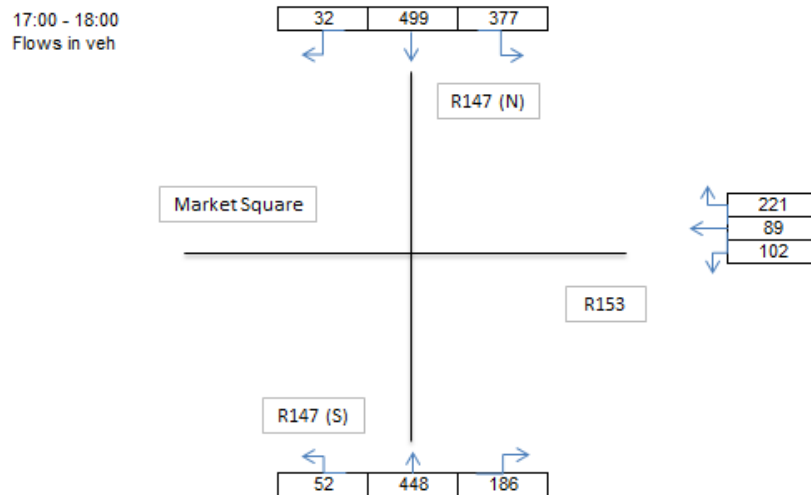


Figure 2.12: PM peak hour turning count diagram for the R147 (N) / Market Square / R147(S) / R153 Junction

It can be seen from the flow diagrams that the predominant peak hour is the PM peak. The total flow through the junction in the AM peak hour is 2037 pcu's and the total flow in the PM peak is 2006 pcu's.

The highest flow in both peak hours is on the R147 (N) arm. In the AM peak, the total flow on this arm is 939 pcu's with the majority of these heading southbound to the R147 (S) arm. In the PM peak, the total flow on the arm is 908 pcu's with the majority of these also heading southbound to the R147 (S) arm.

R153/Summerville Junction

AM Peak Hour
08:00 - 09:00
PCU/hr

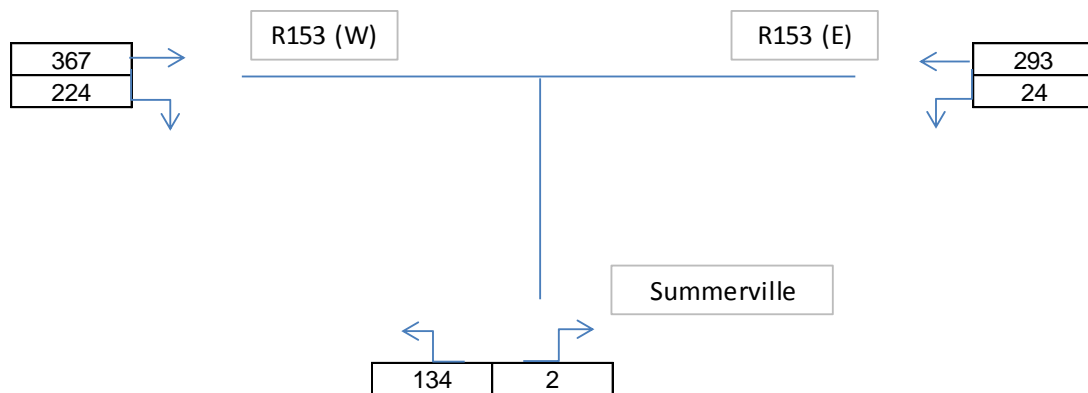


Figure 2.13: AM peak hour turning count diagram for the R153 (W) / Summerville / R153 (E) Junction

PM Peak Hour
17:00 - 18:00
PCU/hr

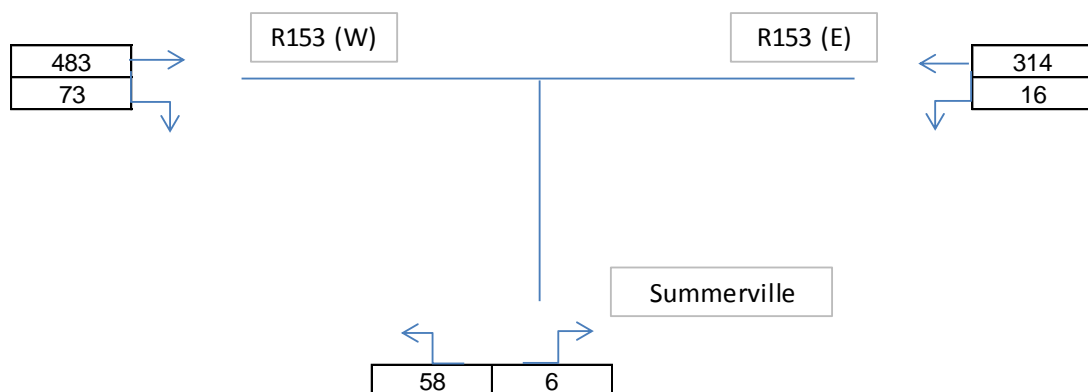


Figure 2.14: PM peak hour turning count diagram for the R153 (W) / Summerville / R153 (E) Junction

It can be seen from the flow diagrams that the predominant peak hour is the PM peak. The total flow through the junction in the AM peak hour is 1044 pcu's and the total flow in the PM peak is 950 pcu's.

The highest flow in both peak hours is on the R153 (W) arm. In the AM peak, the total flow on this arm is 591 pcu's with the majority of these heading northbound to the R153 (E) arm. In the PM peak, the total flow on the arm is 556 pcu's with the majority of these also heading northbound to the R153 (E) arm.

2.3 Walking

The modal split for Navan Town taken from the 2016 Census, which shows that the percentage of people walking to work, school and college was high with 20% travelling by this mode every day. The Navan Transport Plan states that this high percentage of people walking is "very supportive of the need to improve the quality and quantity of footpaths."

Pedestrian surveys were undertaken as part of this scheme, on Tuesday 20th October 2015. The weather for the day was overcast with some sunny spells. The table below highlights the total volume of pedestrians at a number of key junctions within Navan Town where the proposed cycle and walking improvement scheme will run through.

Table 2.1: Pedestrian Survey Results

Junction	Total Pedestrian Volume
R161/Dillonsland/ Petrol Station	1,326
Circular Road/Railway Street Roundabout	4,884
R147/Market Square/R153	1,785
R153/Summerville Junction	927

Results from 2015 indicate that the highest pedestrian volume over the 12 hour period is within the town centre at the Circular Road / Railway Street roundabout junction with a total volume of 4,884 pedestrians through this junction.

2.4 Cycling

The 2016 Census outlines that cycling as a mode of travel to work, school and college within Navan Town is low at just 1.4%. Cycle facilities at present are low within the town. The map in Figure 2.15 indicates the allocated facilities for cyclists.



Figure 2.15: Existing cycle facilities in Navan Town (Source: Google Maps)

As can be seen from the map taken from Google Maps, there are no existing dedicated cycle lanes along any of the regional or National roads within the town.

This scheme proposes to introduce dedicated cycle lanes which will connect some of the larger residential areas within the town into the town centre. It is also envisioned that with the high number of primary and secondary schools located within the town, these facilities would also cater for school children.

3. The Proposed Scheme

3.1 Introduction

This report presents the findings of the options assessment work undertaken for the Navan Greater Dublin Area (GDA) Cycle Routes and a recommendation on the emerging preferred option is made. The scheme route, presented in Figure 3.1 below, extends from Trim Road to Convent Road via Railway Road, Circular Road, Kells Road (R147) and Summerville (Convent Road).

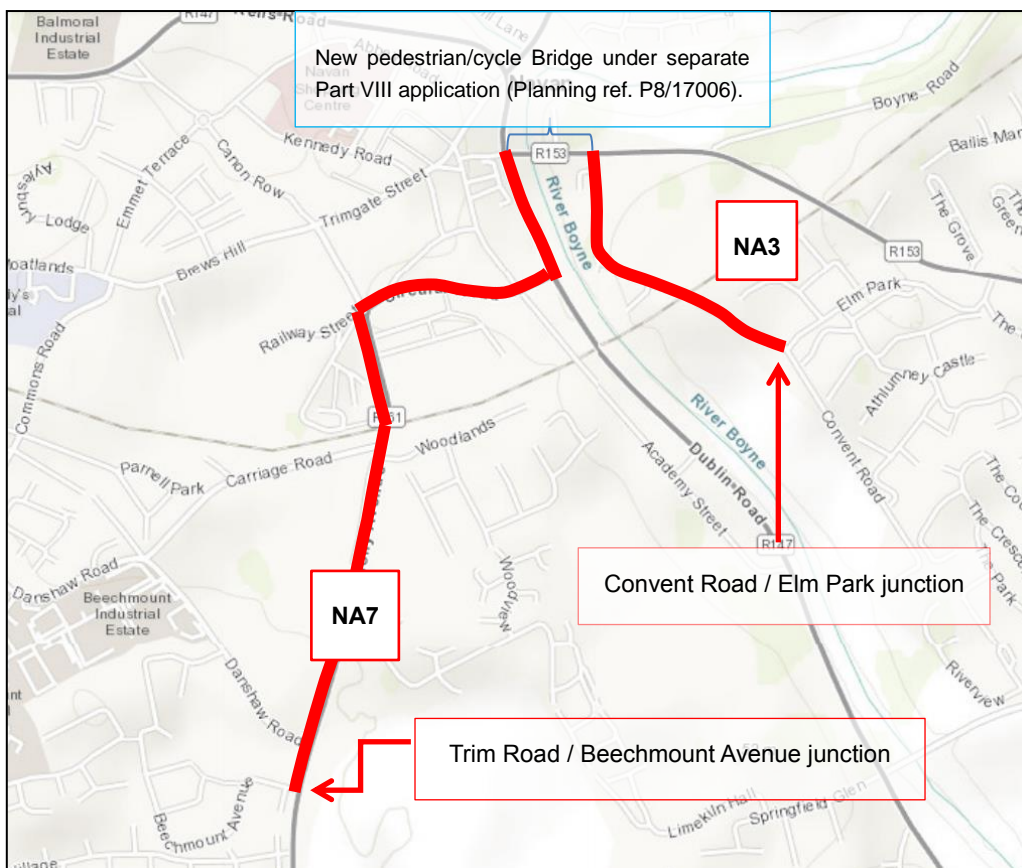


Figure 3.1: Scheme route

As illustrated in Figure 3.2, the scheme route would overlap with the two National Transport Authority (NTA) GDA Primary cycle routes, NA3 and NA7.

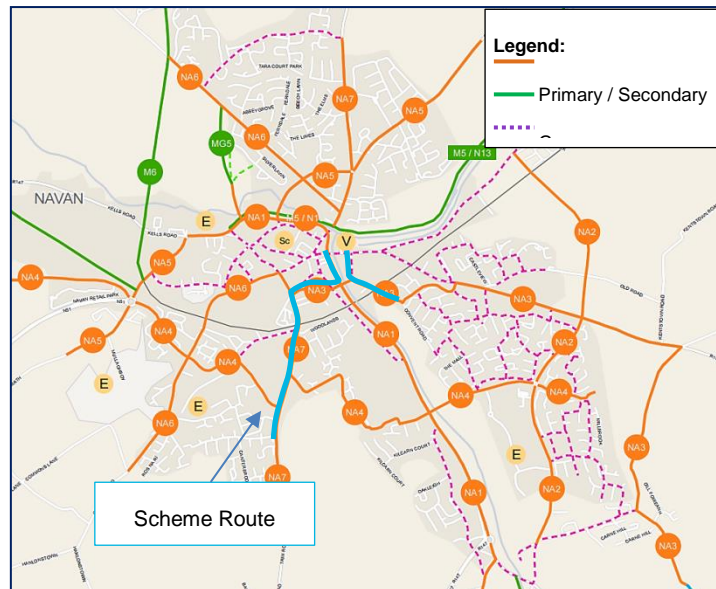


Figure 3.2: GDA Cycle Network Map of Navan

The assessment undertaken of potential design options identified along the scheme route, against established Multi-Criteria Analysis (MCA) criteria is discussed in this report. Where a number of design options were considered along the scheme route, these are also discussed and documented.

3.2 Scheme Objectives

The objective of the scheme is the creation of a safe and sustainable transport network in Navan. The scheme will deliver the following objectives:

- Improve local movement capabilities including access to Navan Town Centre from residential areas south and east of Navan for cyclists and pedestrians.
- Improve cycle safety.
- Create a sustainable mode of access to the many primary and secondary schools in the area.
- Provide consistent and coherent cycle facilities into Navan Town Centre.
- Improve pavement quality and width increasing comfort for cyclists.
- Provide safe and convenient junction layouts for pedestrians and cyclists.
- Provide additional recreational links by linking the local communities to Greenways.

The proposed scheme will also link in with a number of existing and proposed transport infrastructure schemes in the Navan area, including the proposed Navan 2030 public realm improvements within Navan Town Centre and the new pedestrian/cyclist bridge on the Kentstown Road (R153).

3.3 Proposed Cycle Facilities

Details of the proposed scheme are contained within the Options Report.

4. Impact of Proposed Scheme

4.1 Introduction

With the proposed scheme in place, it is very likely that there will be some form of impact on the surrounding road network for all types of modal travel; pedestrians, cyclists and traffic. These impacts will be both positive and negative in nature.

4.2 Impact on Pedestrians

The proposed scheme will have an overall positive impact on pedestrians throughout the scheme. Junction upgrades at the majority of the junctions along both routes will see an improvement of pedestrian crossing facilities and raised crossings will give priority to the pedestrians crossing. With the introduction of speed reductions on approach to and within the town centre, this will give pedestrians further encouragement to cross the road in a safe and secure manner.

4.3 Impact on Cyclists

The proposed scheme will greatly improve facilities for cyclists. The scheme will provide for high quality continuous and attractive cycle facilities along the extent of both routes. The reduction in vehicle speeds and changes at the junctions will improve safety for cyclists.

4.4 Impact on Traffic

Within an urban environment the capacity is defined by the junctions rather than the link capacity. The impact of this scheme on the performance of the junctions is detailed below. While the scheme passes 5 major junctions the existing capacity of the junctions has been maintained at the following;

- R161 Railway Road / R161 Circular Road Junction
 - This junction was reconstructed in 2017, maintaining existing traffic lanes, but providing zebra crossings on all arms for pedestrians and cyclists.
- R147 Kells Road / Kentstown Road / Market Square Junction
 - All existing traffic lanes have been maintained at this junction and therefore there is no change to the existing capacity of the junction.
- Athlumney Road / Convent Road Junction.
 - There are no changes to the existing layout of this junction.

4.5 Junction Analysis

It should be noted that there is an ongoing project taking place in addition to this scheme. As part of this project, there is a National Traffic Model being undertaken and assessed, and overall junction performance within Navan Town will be assessed in this model.

With regard to this scheme, two specific junctions have been reviewed to determine whether the preliminary design was appropriate;

- The Trim Road / Dan Shaw Road signalised junction; and
- The Kells Road / Circular Road signalised junction.

4.5.1 LinSig Analysis

The outputs from the LinSig software present Degree of Saturation (DoS) and queue lengths as indicators of the operational efficiency of the junction. A Degree of Saturation of 100% indicates that the junction is operating at its theoretical maximum capacity, however a value of approximately 90% is considered to be the optimum DOS for a traffic signal controlled junction.

4.5.2 Trim Road / Dan Shaw Road Junction

On Trim Road, it is proposed to upgrade the existing signalised junction at the Esso station to include for upgraded pedestrian crossings and dedicated cycle lanes through the junction. Analysis was undertaken at this junction in order to determine how the junction would perform with the inclusion of these upgraded facilities.

Shown below in Table 4.1 are the LinSig analysis results for the existing and proposed Trim Road / Dan Shaw Road junction in the AM peak hour. While the DoS have increased on most arms of the junction, the increase is marginal, and remains under the optimum DoS for a traffic signal controlled junction (90%).

Table 4.1: Trim Road / Dan Shaw Road AM Modelling Results

		Existing		Proposed	
Arm	Direction	DOS (%)	Mean Max Queue (pcu)	DOS (%)	Mean Max Queue (pcu)
Trim Road (S)	Left Ahead	68.5	12.1	70.5	12.5
Dan Shaw Road	Left Right	65.1	4.2	72.4	4.7
Trim Road (N)	Right Ahead	67.7	7.1	71.9	7.4
Practical Reserve Capacity (%)		31.4		24.3	

Shown below in Table 4.2 are the LinSig analysis results for the existing and proposed Trim Road / Dan Shaw Road junction in the PM peak hour. While the DoS have increased on most arms of the junction, the increase is marginal, and remains under the optimum DOS for a traffic signal controlled junction (90%).

Table 4.2: Trim Road / Dan Shaw Road PM Modelling Results

		Existing		Proposed	
Arm	Direction	DOS (%)	Mean Max Queue (pcu)	DOS (%)	Mean Max Queue (pcu)
Trim Road (S)	Left Ahead	76.5	11.0	79.9	11.5
Dan Shaw Road	Left Right	77.2	8.2	78.9	9.1
Trim Road (N)	Right Ahead	76.8	9.7	80.8	10.2
Practical Reserve Capacity (%)		16.5		11.4	

Results show that in both peak hours, the proposed junction will perform under capacity with a PRC of 24.3% in the AM peak hour and 11.4% in the PM peak hour. The highest queuing in both peak hours is on Trim Road (S) arm with an average queue of 12.5 pcu in the AM peak and 11.5 pcu in the PM peak. In the AM peak, the Dan Shaw Road arm has the highest saturation with 72.4%. In the PM peak, the Trim Road (N) arm is most saturated with 80.8%. Overall, the junction is performing above its operational capacity, however, with slight delay and queuing during peak traffic hours.

4.5.3 R147 Kells Road / Circular Road Junction

On Kells Road, it is proposed to upgrade the existing signalised junction, by removing the existing left slip lanes and providing new upgraded Toucan crossings to link the proposed cycle facilities on Circular Road and Kells Road. Analysis was undertaken at this junction in order to determine how the junction would perform with the inclusion of these upgraded facilities.

Shown below in Table 4.3 are the LinSig analysis results for the existing and proposed Kells Road / Circular Road junction in the AM peak hour. While the DoS have increased on most arms of the junction, the increase is marginal, and remains under the optimum DOS for a traffic signal controlled junction (90%). The most significant increases in DoS are where it is proposed to remove the existing left slip lane and replace these with left turn lanes. However, this was undertaken to provide safer pedestrian and cycle facilities at the junction.

Table 4.3: R147 Kells Road / Circular Road AM Modelling Results

Arm	Direction	Existing		Proposed	
		DOS (%)	Mean Max Queue (pcu)	DOS (%)	Mean Max Queue (pcu)
Kells Road (S)	Left	26.2	2.1	33.3	4.1
Kells Road (S)	Ahead	64.6	12.6	69.9	13.3
Circular Road	Left	16.2	1.0	69.9	8.6
Circular Road	Right	63.9	7.6		
Kells Road (N)	Ahead	32.5	6.4	35.4	7.3
Kells Road (N)	Right	63.6	9.5	71.3	10.1
Practical Reserve Capacity (%)		39.2		26.3	

Shown below in Table 4.4 are the LinSig analysis results for the existing and proposed Kells Road / Circular Road junction in the PM peak hour. While the DoS have increased on most arms of the junction, the increase is marginal, and remains under the optimum DOS for a traffic signal controlled junction (90%). The most significant increases in DoS are where it is proposed to remove the existing left slip lane and replace these with left turn lanes. However, this was undertaken to provide safer pedestrian and cycle facilities at the junction.

Table 4.4: R147 Kells Road / Circular Road PM Modelling Results

Arm	Direction	Existing		Proposed	
		DOS (%)	Mean Max Queue (pcu)	DOS (%)	Mean Max Queue (pcu)
Kells Road (S)	Left	22.2	1.9	27.6	3.0
Kells Road (S)	Ahead	71.9	14.3	82.8	16.1
Circular Road	Left	20.8	1.4	83.5	16.5
Circular Road	Right	72.7	11.7		
Kells Road (N)	Ahead	33.2	6.7	37.3	7.6
Kells Road (N)	Right	72.5	9.4	79.8	10.1
Practical Reserve Capacity (%)		23.7		7.8	

Results show that in both peak hours, the junction will perform under capacity with a PRC of 26.3% in the AM peak hour and 7.8% in the PM peak hour. The highest queuing in both peak hours is on Kells Road (S) with an average queue of 13.3 pcu in the AM peak and 16.1 pcu in the PM peak. In the AM peak, the Circular Road arm has the highest saturation with 69.9%. In the PM peak, the Circular Road arm is again the most saturated with 83.5%. Overall, this junction is performing under its operational capacity, however, with slight delay and queuing during peak traffic hours.

4.5.4 R147 Kells Road / Kentstown Road Junction

On Kells Road, it is proposed to upgrade the existing signalised junction, by providing new upgraded pedestrian crossings to link the new pedestrian / cycle bridge with the town centre. The existing layout of the junction is to be maintained, with 2 lanes of traffic provided on the Kells Road North and Kells Road South arms of the junction. A single lane is maintained on the Kentstown Road. There is currently one pedestrian crossing provided on the Kells Road North arm of the junction. This currently runs in a stage with the right turners onto Kentstown Road. However, with the new layout the right turners will not be facilitated to run in this stage with an “all-red” pedestrian stage called instead. Analysis was undertaken at this junction in order to determine how the junction would perform with the inclusion of these upgraded pedestrian and cycle facilities.

Shown below in Table 4.5 are the LinSig analysis results for the existing and proposed Kells Road / Kentstown Road junction in the AM peak hour. While the DoS have increased on most arms of the junction, the increase is marginal, and remains under the optimum DOS for a traffic signal controlled junction (90%). The most significant increases in DoS is on the Kells Road South right turning arm, as it is given less green time in this scenario. However, this was undertaken to provide safer pedestrian and cycle facilities at the junction.

Table 4.5: R147 Kells Road / Kentstown Road AM Modelling Results

Arm	Direction	Existing		Proposed	
		DOS (%)	Mean Max Queue (pcu)	DOS (%)	Mean Max Queue (pcu)
Kells Road (N)	Ahead Left	71.6	14.7	81.8	16.5
Kells Road (N)	Ahead	66.2	14.0	76.1	15.5
Kentstown Road	All	75.8	15.7	81.3	16.8
Kells Road (S)	Left Ahead	57.9	11.7	66.2	12.8
Kells Road (S)	Right	48.8	3.7	80.2	8.4
Practical Reserve Capacity (%)		18.8		10.0	

Shown below in Table 4.6 are the LinSig analysis results for the existing and proposed Kells Road / Kentstown Road in the PM peak hour. The DoS on all arms of the junction remains under the optimum DOS for a traffic signal controlled junction (90%). The most significant increases in DoS is on the Kells Road South right turning arm, as it is given less green time in this scenario. However, this was undertaken to provide safer pedestrian and cycle facilities at the junction.

Table 4.6: R147 Kells Road / Kentstown Road PM Modelling Results

Arm	Direction	Existing		Proposed	
		DOS (%)	Mean Max Queue (pcu)	DOS (%)	Mean Max Queue (pcu)
Kells Road (N)	Ahead Left	65.1	13.2	59.6	12.2
Kells Road (N)	Ahead	63.1	12.8	56.7	11.9
Kentstown Road	All	69.5	12.9	81.5	14.8
Kells Road (S)	Left Ahead	65.8	14.6	60.3	13.5
Kells Road (S)	Right	42.2	3.2	80.7	7.9
Practical Reserve Capacity (%)		29.4		10.5	

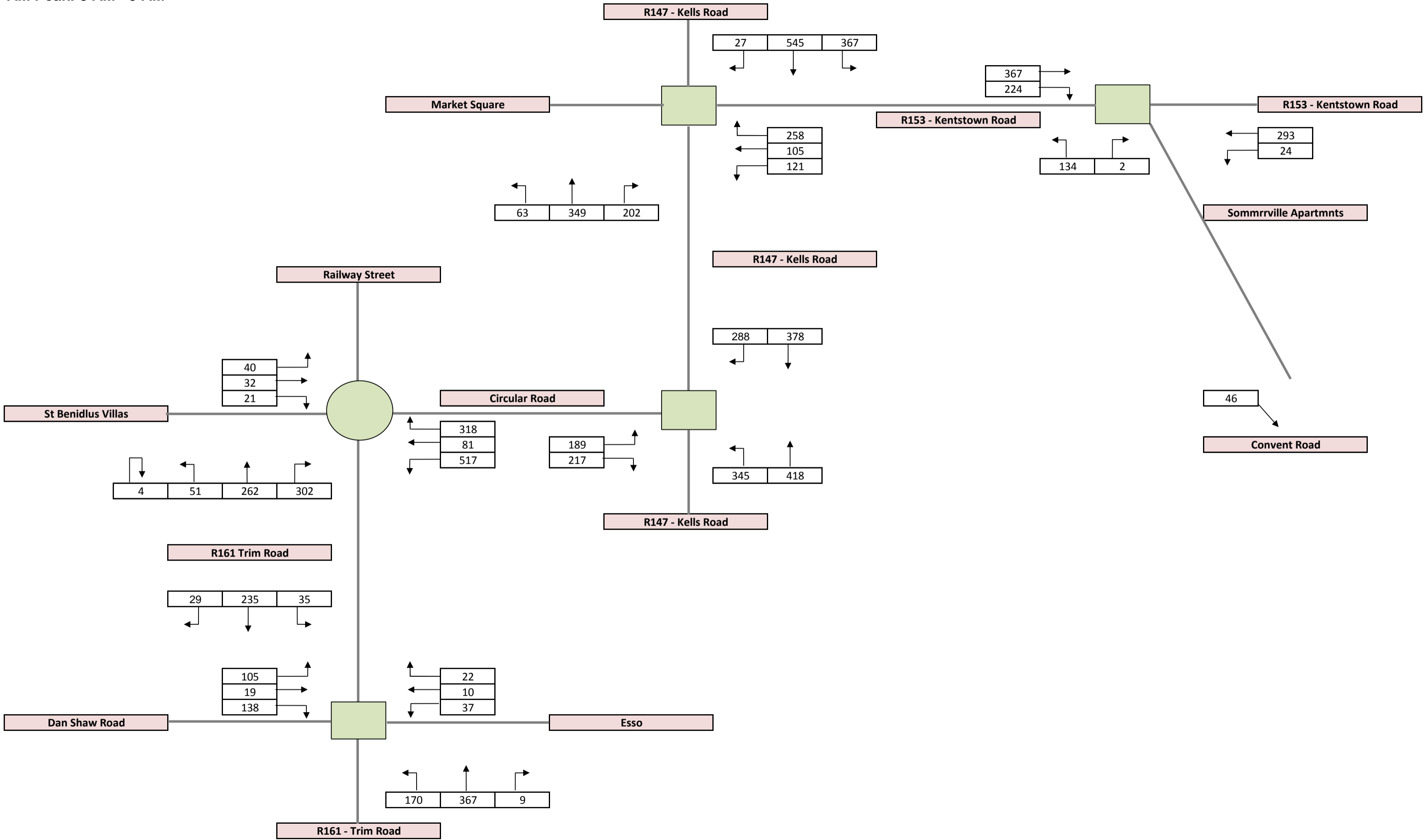
Results show that in both peak hours, the junction will perform under capacity with a PRC of 10.0% in the AM peak hour and 10.5% in the PM peak hour. The highest queuing in both peak hours is on Kentstown Road with an average queue of 16.8 pcu in the AM peak and 14.8 pcu in the PM peak. In the AM peak, the Kells Road North arm has the highest saturation with 81.8%. In the PM peak, the Kentstown Road is the most saturated with 81.5%. Overall, this junction is performing under its operational capacity, however, with slight delay and queuing during peak traffic hours.

4.5.5 Conclusion

The results of the junction analysis demonstrate that the proposed changes to the signal controlled junctions will result in marginal higher Degree of Saturation (DoS), queues and delays at all junctions, but overall, each junction will operate under its maximum operational capacity and therefore can accommodate the existing traffic demand.

Appendix A Traffic Flow Diagrams

Navan GDA Cycle Network
AM Peak: 8 AM - 9 AM



Navan GDA Cycle Network
 PM Peak: 5 PM - 6 PM

