

Limerick City and County Council
New Junction at Plassey Road
Part VIII Report

Issue 1 | 6 August 2020

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1 Introduction

Limerick City & County Council is seeking Part VIII planning approval for an upgrade of a junction at Plassey Road, Co. Limerick. The upgrade includes the signalisation of previously unsignalized (priority) junctions at Plassey Road/Plassey Park Road and the addition of dedicated pedestrian and cycle crossing facilities. It encompasses a bus lane along Plassey Road and additional cycle lanes along Plassey Park Road. Additionally, two smaller junctions along Plassey Park Road will also be upgraded, one at the northern entrance of the enterprise park and another at Lonsdale Road.

This report should be read in conjunction with accompanying plan layouts and section details (T-0100-00 to 03). A Stage 1 Road Safety Audit (RSA), as well as Environmental Impact Assessment (EIA) and Appropriate Assessment (AA) Screening Reports also form part of this application.

2 Site Context

2.1 Location and Context

The subject junction(s) are located in Co. Limerick, East of Limerick City, in the Castletroy area. North-West of the site is the University of Limerick grounds; to the North-East and South-East are multiple employment zones and South-West is primarily residential. The location and its context in relation to the surrounding area are shown in **Figure 1**.

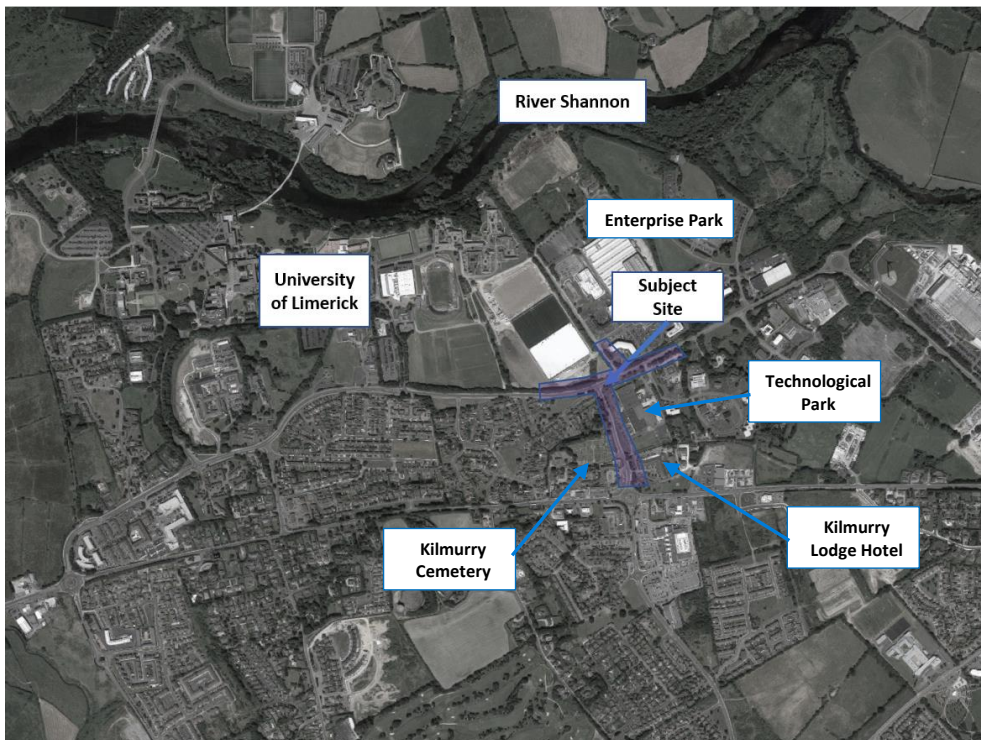


Figure 1: Site Location and Context (© Google 2020)

2.2 Local Road Links

The road network through, and in the immediate vicinity of, the study area is presented in **Figure 2**.



Figure 2: Existing road network around the site (© Google 2020)

Plassey Park Road starts at Groody Roundabout, runs through Milford Grange and passes University of Limerick providing a route to the Castletroy area before it joins back to the Dublin Road (R445) at Annacotty Roundabout.

The roadway generally consists of a single lane of traffic in each direction, with footpaths and cycle lanes provided on both sides of the road as far as the Plassey Road Junction. The footpath on the North terminates at the junction of Troy Studios Road.

Plassey Road (L1118) [often referred to as Milford Road] is a local road that provides a connection between Kilmurry Roundabout on the Dublin Road (R445) and Plassey Park Road. The roadway consists of a single lane of traffic in each direction, with footpaths and cycle lanes provided on both sides of the road. The cycle lane on the East terminates approximately 110m North of Kilmurry Roundabout.

The Troy Studios Road consists of a single lane of traffic in both directions. Footpaths are provided on both sides for approximately 40m before the Western footpath terminates at an uncontrolled crossing.

The footpath on the East continues for the length of the road, only ceasing at the access to the National Technological Park.

2.3 Existing Junctions

- **Plassey Park Rd / Plassey Rd:** This is a three arm unsignalized junction, with two arms on Plassey Park Road and one on Plassey Road. There are no formal pedestrian or cyclist crossings at either arm of the junction.
- **Plassey Park Rd / Troy Studios Rd:** This is a three arm unsignalized junction, with two arms on Plassey Park Road and one on Troy Studios Road. There is one uncontrolled crossing on the Troy Studios Road.
- **Plassey Park Rd /Northern Entrance to the Enterprise Park:** This is a minor side road access/egress offering a secondary entrance to the Enterprise Park to the south-east of Plassey Park Road/Plassey Road, in conjunction with the main entrance to the park via Lonsdale Road.
- **Plassey Rd / Dun an Oir Rd / Kilmurry Church Rd:** This is a staggered four arm unsignalized junction, with two arms on Plassey Rd, one on Dun an Oir Rd and one leading to the Kilmurry Church. There are no formal pedestrian or cyclist crossings at either arm of the junction.
- **Plassey Rd / The Orchard Rd:** This is a three arm unsignalized junction, with two arms on Plassey Park Road and one which leads into a retail and residential area called The Orchard. There are no formal pedestrian or cyclist crossings at either arm of the junction.
- **Plassey Rd / Kilmurry Lodge Hotel:** This is also a three arm unsignalized junction with two arms on Plassey Park Road and one which leads into the Kilmurry Hotel. There are no pedestrian or cyclist crossings at either arm of the junction.

2.4 Existing Road Network Issues

A number of issues in relation to the current road network operation along Plassey Park Road have been identified, including:

- Poor provision for pedestrians and cyclists crossings;
- Variable and unpredictable delays to traffic at peak times, especially due to the priority operation of the junctions;
- Substandard dedicated cycling facilities along Plassey Park Road;
- Junction delays for cars accessing and egressing from Troy Studios Road; and
- There are no dedicated bus provisions along the road, particularly for those traveling along Plassey Park Road and wishing to turn right (south) onto Plassey Road. This leads to delay for bus services as they currently must travel along Plassey Park Road past the subject site, turn at the roundabout approximately 850m to the east, and return to the subject site before turning left onto Plassey Road.

2.5 Public Transport

Public transport in the area consists of Dublin Coach (307 & 308) and Bus Eireann (304 & 304a) buses.

All of the buses pass through Plassey Park Road and turn right on Plassey Road. Bus 304 drives through the junction and continues on Plassey Park Road during certain times of the day. The Dublin Coach M7 Express Service and Bus Eireann X12 service also pass through the site route.

There are two bus stops within the site, one on Plassey Park Road, close to the junction, and the other on Plassey Road, in front of the Kilmurry Lodge Hotel. The aforementioned buses, with the expectation of M7 Express, stop at these stops.

Through consultation with the National Transport Authority (NTA) it has been noted that the Plassey Park Road/Plassey Road junction, currently on the 304 and 304A lines, is likely to form part of a key branch on the planned UL to City Centre bus route (likely to arise from the emerging Limerick Metropolitan Area Transport Strategy [LMATS]). The design therefore needs to be cognisant that bus frequency on this route is potentially going to increase. The future bus network will also likely include buses making the right turn movement on the eastbound approach, which is currently undertaken via a right turning lane with buses making the turn at gaps in traffic.

2.6 Pedestrian and Cyclist Facilities

On Plassey Park Road, footpaths and cycle lanes are provided on both sides of the road as far as the Plassey Road Junction. The footpath on the North terminates at the junction of Troy Studios Road.

Footpaths and cycle lanes are provided on both sides of Plassey Road. The cycle lane on the East terminates approximately 110m North of Kilmurry Roundabout, with the cycle lane on the west terminating approximately 90m away.

On the northern arm of the Kilmurry roundabout there are shared walking and cycle facilities on both sides of the road. These facilities are off road on the pavement. There is an uncontrolled zebra crossing at the roundabout served by an island.

On the Troy Studios Road, footpaths are provided on both sides for approximately 40m before the Western footpath terminates at an uncontrolled crossing. The footpath on the East continues for the length of the road, only ceasing at the access to the National Technological Park.

2.7 Existing Traffic Movements

Traffic counts were carried out in December 2018 at a number of junctions in the study area, including Plassey Road, Lonsdale Road, and Troy Studios Road junctions with Plassey Park Road, along with the Dun an Oir junction on Plassey Road, and a number of other minor side roads.

The results of the modelling assessment carried out on vehicle traffic flows during the AM peak hour (08:00-09:00) and the PM peak hour (17:00-18:00) are presented in **Table 1**.

Table 1: Existing Scenario Operational Capacity

Approach	AM		PM	
	RFC	Queue	RFC	Queue
Plassey Road	1.02	18	0.4	1
Plassey Park Road Westbound	0.65	3	0.07	<1
Troy Studios Road	0.25	<1	0.88	6
Plassey Park Road Eastbound	0.17	<1	0.51	1

From this we can see that in the AM peak, the highest levels of queueing occurred on Plassey Road, with queues of 18 Passenger Car Units (pcu). This arm is operating just over capacity, with a Ratio of Flow to Capacity (RFC) of 1.02.

In the PM peak the highest levels of queueing occurred on the Troy Studios Road with queues of up to 6 pcu. This arm is operating close to capacity, with an RFC of 0.88.

2.8 Road Safety

A review of the available road safety collision record history on www.rsa.ie (from the years 2005-2016) demonstrates the collision history, with some incidents recorded along Plassey Park Road and Plassey Road.

Figure 3 shows the collision history including associated incident locations.

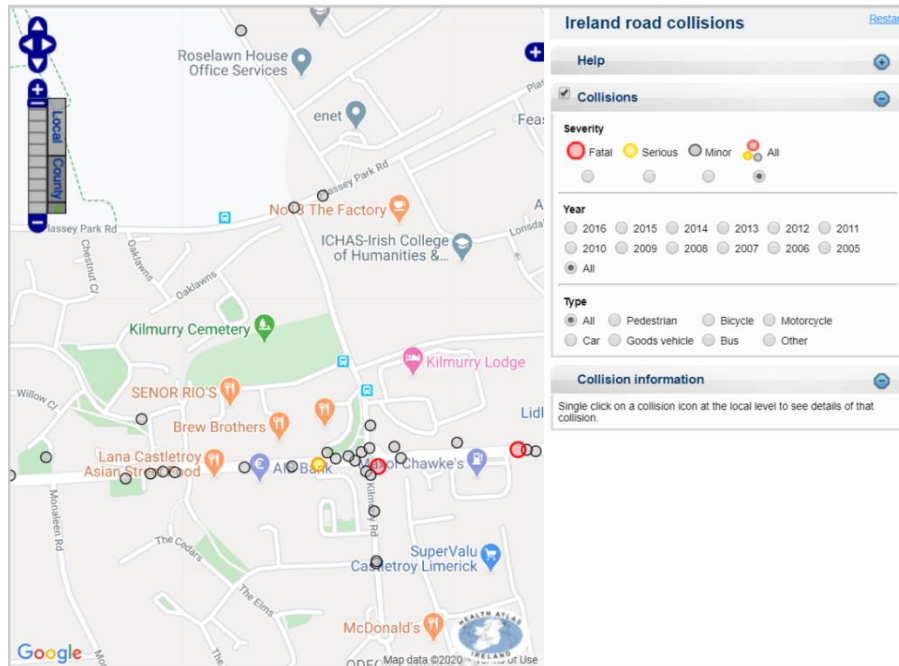


Figure 3: RSA.ie collision history on Plassey Park Rd / Plassey Rd

It can be seen above that the number of incidents recorded along Plassey Park Road and Plassey Road from 2005-2016 is quite low. A number of incidents occurred at Kilmurry Roundabout, but these are outside the proposed development boundary. In total there has been three incidents within the development boundary, with all three being described as 'minor'. Two of these involved cars and the other involved a car and a pedestrian. Although there are no significant clusters that would warrant a further detailed investigation, these incidents may indicate that the functionality of the route is not providing sufficient priority to pedestrians.

3 Scheme Proposals

3.1 Scheme objectives and criteria

The following is a list of the Scheme objectives which guided the preliminary design. The design should:

- Improve the road arrangement to accommodate existing and future pedestrian, cycle, public transport and vehicular traffic accessing the area through the consideration of a new signalised junction layout.
- Reduce the delays for vehicles accessing and exiting the Troy Studios Road.
- Provide safe crossing points for pedestrians.
- Upgrade of existing footways and creation of new pedestrian and cycle links.
- Assess bus stop locations and adequacy and amend as necessary.
- Provision of bus lanes on Plassey Park Road and Plassey Road.
- Be compatible with existing road network operation.
- Be compatible with other projects underway in the vicinity (i.e. new layout proposed for Plassey Park Road to the east of the scheme, which is currently going through planning).
- Minimise impact on existing utility services.

3.2 Major Scheme Proposals

Taking into account the main scheme objectives and criteria, it was deemed that the proposals should include:

- The provision of a new signalised junction at Plassey Park Rd / Plassey Rd.
- Upgrading Troy Studios Road to improve operation capacity.
- Provision of new pedestrian and cycle facilities to provide safer routes and crossing points.
- Additional bus lanes on Plassey Park Road and Plassey Road to allow busses to move more freely. Where necessary, new bus stops will be provided; and existing bus stops will be retained and improved.

4 Plassey Park Road Junction Selection

In order to address the identified issues relating to traffic operation, pedestrian priority and safety and cyclist provision, a number of options for the type of junction(s) on Plassey Park Road were examined. This section addresses the junction type selection of the junction and the assessment of the options considered.

In total three options were examined. One of these is the current or ‘do nothing’ scenario. There were two ‘do something’ options examined, including the realignment of Troy Studios Road to form a signalised crossroads with Plassey Road, and the signalisations of both Troy Studios Road and Plassey Road as staggered signalised junctions in their current alignments.

This assessment was carried out independent of wider project proposals and was used to inform the most appropriate treatment for the junctions, with the preferred option then being brought forward through overall design development of the scheme.

4.1 Option 0 – Existing Situation

Existing Plassey Road, Plassey Park Road and associated unsignalized (priority) junctions as noted previously in Section 2.

4.2 Option 1 – New Road and Junction Design

Option 1 of the proposed development involves the realignment of the existing Troy Studios Road, including the construction of approx. 160m of new road through an area of existing grassland, and the provision of a new signalised cross-road at its intersection with Plassey Park Road.

This option also involves the proposed widening of the existing road/footpath into existing roadside grassed areas/vegetation. It would result in the realignment of Troy Studios road with Plassey Park Road.

This arrangement includes new bus lanes both east and west bound on Plassey Park Road and a north bound bus lane on the L1118 approaching the junction.

As part of the works it is proposed to convert the existing kneeling bus stop (approximately 100m west of the junction) to an in-line bus stop, and to extend the right-turn lane on Plassey Park Road to allow buses to enter the right-turn lane directly from the bus stop.

The emerging Option 1 concept design is illustrated in **Figure 4**.

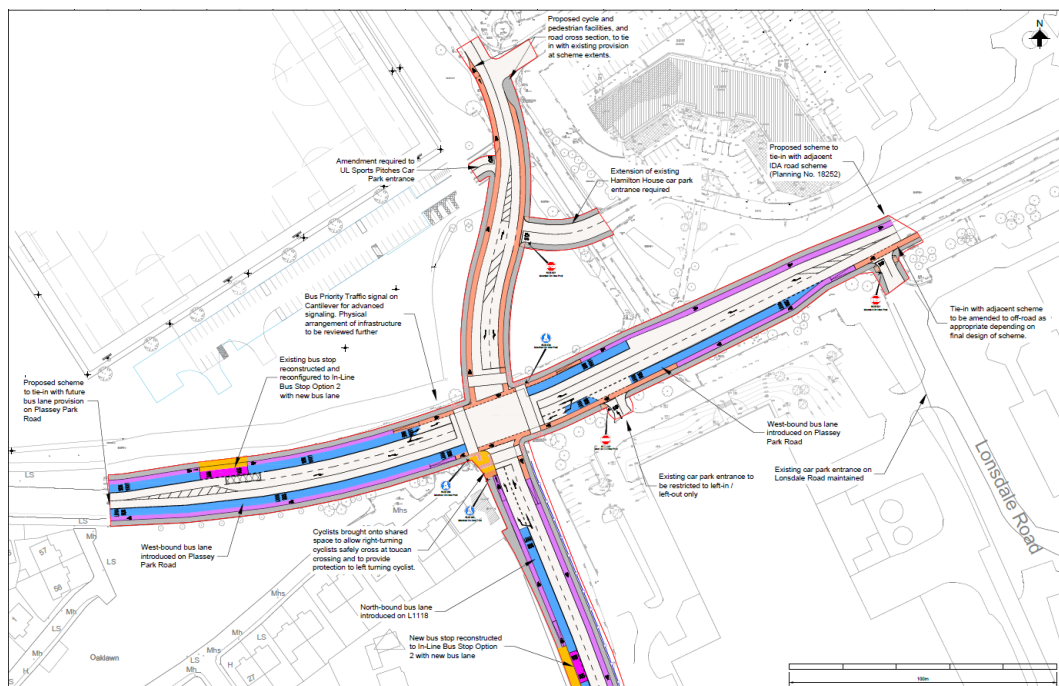


Figure 4: Emerging Option 1 Concept Design

4.3 Option 2 – Existing Junction Upgrade Works

Option 2 involves the retention of the existing road layout largely in the same configuration of two 3-arm junctions, with both junctions signalised and the addition of turning lanes for all right turning movements.

This arrangement includes new bus lanes both east and west bound on Plassey Park Road and a north bound bus lane on the L1118 approaching the junction.

This option also involves the proposed widening of the existing road/footpath into existing roadside grassed areas/vegetation.

As part of the works it is proposed to convert the existing kneeling bus stop (approximately 90m west of the Plassey Road junction) to an in-line bus stop, and to extend the right-turn lane on Plassey Park Road to allow buses to enter the right-turn lane directly from the bus stop.

The emerging Option 2 concept design is illustrated in **Figure 5**.

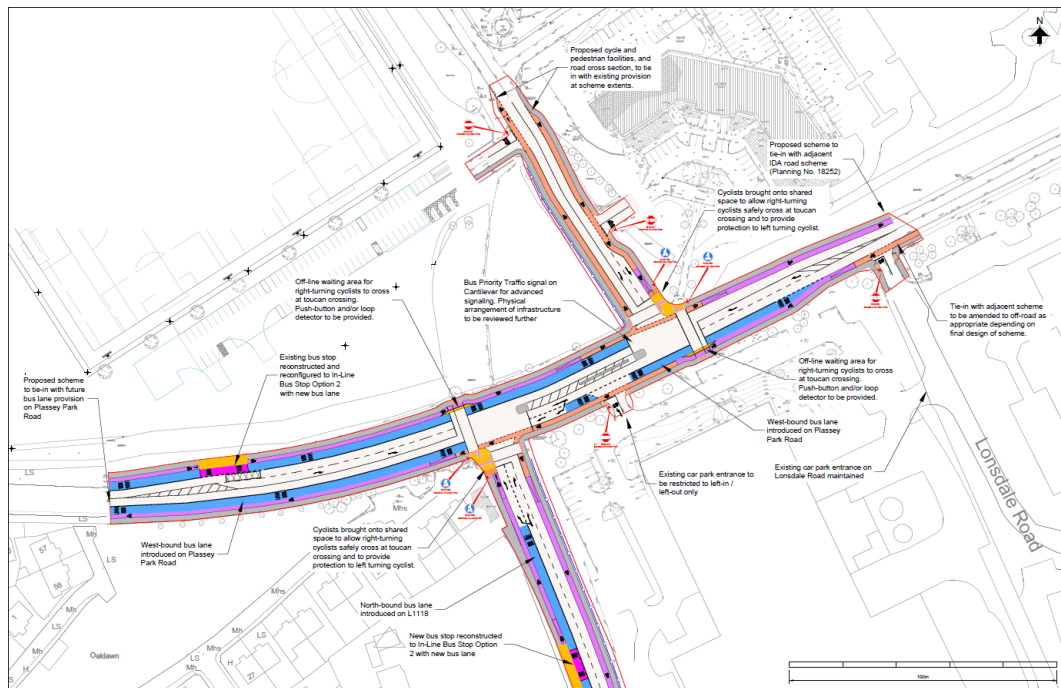


Figure 5: Emerging Option 2 Concept Design

4.4 Options Evaluation Criteria

The following section outlines the criteria used in the evaluation of the various improvement options. The development of the evaluation criteria has been based on the key criteria established within the Common Appraisal Framework for Transport Projects and Programmes by the Department of Transport and Tourism and Sport and are grouped as follows:

- Economy;
- Safety;
- Integration; and
- Environment.

4.4.1 Economy

The key elements considered under this criterion will include the operational performance of the proposed option in terms of improving traffic conditions within the study area. This criterion will also consider the potential the proposed options will have in accommodating development growth in area.

For comparative purposes the cycle time has been set the same for both proposed options, however the staging and cycle times of the preferred option may be developed and optimised further as part of design development.

The evaluation criteria considered under this heading include the following:

1. Operational Performance; and
2. Capital Cost.

4.4.2 Safety

The key elements considered under this criterion include the safety improvements resulting from the proposed options. The review will include a safety review based on all road users, including pedestrians and cyclists.

The evaluation criteria considered under this heading include the following:

1. Road User Safety.

4.4.3 Integration

The key elements considered under this criterion include the alignment of the proposals with respect to the committed policy documents for the study area and embracing the smarter travel policy objectives for the study area.

The evaluation criteria considered under this heading include the following:

1. Policy Integration.

4.4.4 Environment

The key elements considered under this option include the impact the proposed option has on the receiving environment including both the natural and built environment. The environmental issues considered will be the projected change in air quality, noise, landscape environment and biodiversity and impacts on existing land use, cultural heritage and water resources.

A high-level assessment of the potential for significant effects to arise on Natura 2000 sites arising from the proposed development was carried out, forming the basis for the assessment under the Environmental Impacts criterion.

It is noted that full Appropriate Assessment (AA) Screening and Environmental Impact Assessment (EIA) Screening reports have been developed for the preferred option as part of this Part VIII planning application, and any information within the options assessment section refers only to the high-level assessment carried out. This high level information is for comparative purposes only and is superseded by the information within the subsequent screening reports.

The evaluation criteria considered under this heading includes the following:

1. Environmental Impacts; and
2. Land Use Impact.

4.4.5 Evaluation Grading

For each individual assessment criterion considered, options have been compared against each other based on a five-point scale, ranging from having significant advantages to having significant disadvantages compared to other route options.

For illustrative purposes, this five-point scale is colour coded as presented in **Table 2**, with advantageous routes graded as dark green and disadvantaged routes graded as dark red.

Table 2: Route Options Colour Coded Ranking Scale

Colour	Description
	Significant advantages over the other options
	Some advantages over other options
	Neutral compared to other options
	Some disadvantages over other options
	Significant disadvantages compared to other options

At the end of the options assessment, an overall Multi-Criteria Appraisal (MCA) table is provided, bringing together each of the individual criterion assessments. This is then summarised for each study area section under the main assessment criterion.

A qualitative appraisal of, and conclusion from, the options assessment is then provided, highlighting the key issues considered in determining recommended options ('preferred' and in some instances, where applicable, 'next preferred'). It should be noted that a balanced approach is taken when assessing the preferred options. All criteria are considered in undertaking the assessment, and a lower ranking on one criterion, for example, will not necessarily mean that the option is not suitable.

4.5 Options Evaluation

4.5.1 Option 0: Existing Situation – Do Nothing

Option 0 refers to the existing scenario whereby both the eastern and western junctions are priority junctions with Plassey Park Road, and the entrance to the business centre car park between the two junctions is also operational, effectively as a third priority junction.

4.5.1.1 Operational Performance

The traffic modelling exercises, as well as confirmatory site visits and observations, have shown that in the existing layout, the minor arms of the junctions are experiencing queuing in the AM and PM peaks, and with future growth in traffic, it is expected that this will worsen.

Due to the priority nature of the two junctions the main arms of Plassey Park Road do not experience the same levels of queuing, however it is noted that due to the lack of right turn lane onto Troy Studios Road, there is some amount of queuing westbound on Plassey Park Road.

The full results are shown in Section 2.7.

4.5.1.2 Capital Cost

No cost associated as existing retained.

4.5.1.3 Road User Safety

The existing scenario is deemed to be unsafe for both pedestrians and cyclists, with no dedicated crossing facilities or cycle lanes through the junctions. In numerous locations both cycle lanes and footpaths end abruptly despite clear desire lines being evident.

4.5.1.4 Policy Integration

There are three bus stops of interest in the vicinity, all of which are shown in **Figure 6**. The stop outlined in yellow does not appear to be in operation.

The existing bus provision is as described in Section 2.

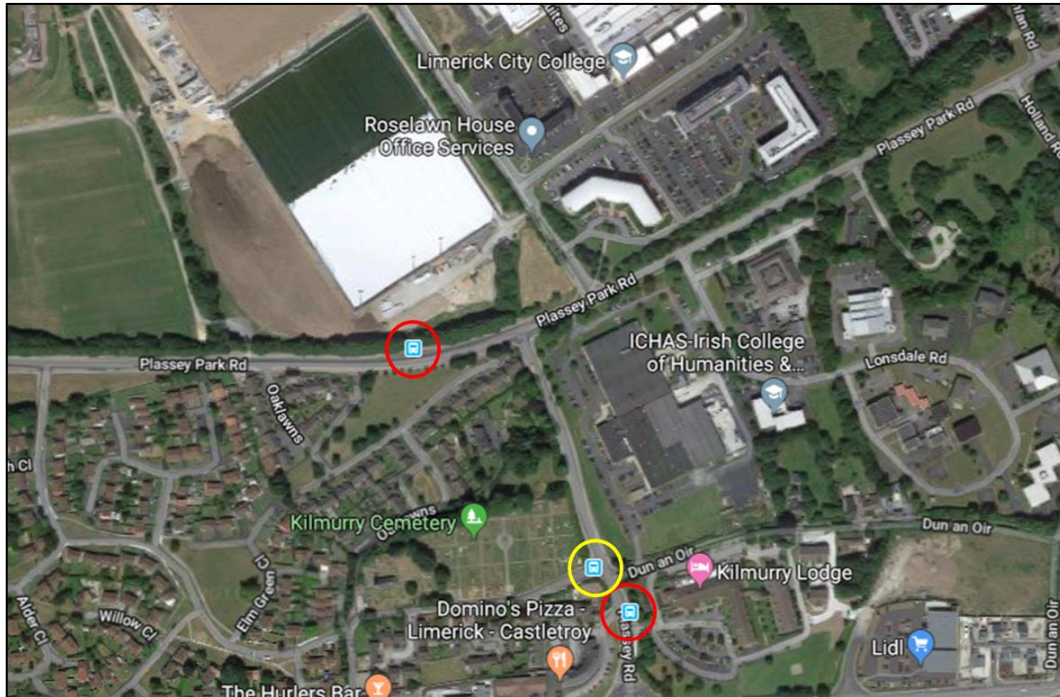


Figure 6: Bus Stops in the works vicinity (Google Maps, 2018)

Observations have shown that certain bus services approaching from the west on Plassey Park Road, pass the subject junction and turn around at the existing roundabout to the east, before returning westward, collecting passengers at a bus stop on Plassey Park Road, and then turning left down Plassey Road.

This option maintains the current access and service provisions outlined above.

4.5.1.5 Environmental Impacts

No change as existing retained.

4.5.1.6 Land Use Impact

No change as existing retained.

4.5.2 Option 1: New Road and Junction Design

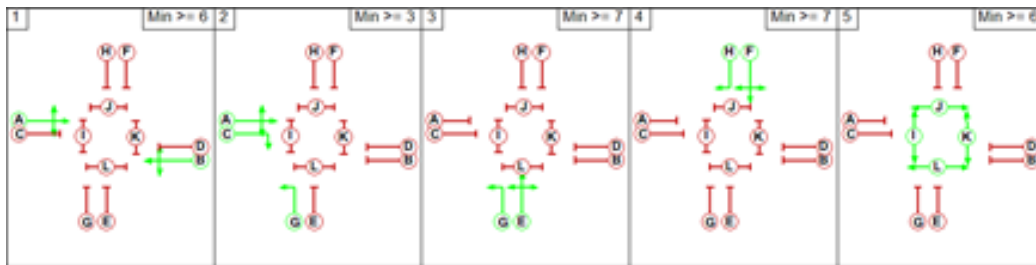
Option 1 includes the realignment of the existing Troy Studios Road, including the construction of a new road, and the provision of a new signalised cross-road at its intersection with Plassey Park Road.

4.5.2.1 Operational Performance

The 4-arm layout with right turning lanes on all four arms, and the signal staging set for efficient flow of traffic, operates well within capacity.

The modelled scenario involves a 5-stage cycle, with the minor arms running in the same phase.

Within the model the cycle time was set to 100s, and it resulted in a **practical reserve capacity (PRC)** of 18% in the AM, and 27% in the PM. This arrangement is indicated below.



Therefore, the chosen scenario for the cross-roads option saw a **PRC of 18% in the AM**, and **27% in the PM**, in the opening year.

In the opening year, under Option 1, the new junction experiences a significant improvement in operational performance compared to the existing scenario with a maximum **degree of saturation (DoS)** of 76%, occurring in the PM peak. There is a high level of residual capacity on all arms in the AM Peak aside from Plassey Park Road westbound and Plassey Road northbound, which are each approximately three-quarters capacity. The full breakdown is shown in **Table 3**.

Table 3: Opening Year Operational Capacity of Option 1

Approach	Movement	AM		PM	
		DoS	Queue	DoS	Queue
Plassey Park Road Eastbound	St/L	25%	4	5%	1
	St	35%	5	17%	2
	R	16%	2	71%	7
Troy Studios Road	St/L	31%	1	70%	7
	R	31%	1	70%	7
Plassey Park Road Westbound	St/L	11%	1	69%	7
	St	64%	10	60%	7
	R	75%	6	9%	1
Plassey Road	L	55%	6	45%	4
	St/R	76%	7	30%	1

Note: L = Left; R = Right; St = Straight Ahead, Queue is Mean Maximum Queue (in pcus)

In the design year of 2035, the cycle time was set to 110s cycle, and the modelling showed all junction to operate within capacity.

The modelling showed the junction to operate with a **PRC of 14% in the AM** and **18% in the PM**. As shown in **Table 4**, the anticipated maximum DoS was shown as 79%, on the Plassey Road arm.

Table 4: 2035 Operational Capacity of Option 1

Approach	Movement	AM		PM	
		DoS	Queue	DoS	Queue
Plassey Park Road Eastbound	St/L	26%	4	5%	1
	St	37%	7	18%	3
	R	17%	2	76%	9
Troy Studios Road	St/L	40%	2	77%	10
	R	40%	2	77%	10
Plassey Park Road Westbound	St/L	10%	1	74%	9
	St	64%	11	42%	5
	R	78%	8	11%	1
Plassey Road	L	59%	7	5%	5
	St/R	79%	9	67%	2

Note: L = Left; R = Right; St = Straight Ahead, Queue is Mean Maximum Queue (in pcus)

4.5.2.2 Capital Cost

This option requires new road construction and signalisation of the new junction and includes the construction of bus lanes, off-road cycle tracks, installation of traffic signals, provision of new footpaths, resurfacing and new lining and signage, as well as significant diversions to existing Eir infrastructure.

A high-level cost assessment was carried on the initial design of Option 1 to determine the order of magnitude cost of the works requirement for comparative assessment.

This included an indicative cost received from Eir regarding potential alterations to the infrastructure, final costing for this item will be determine through further design and consultation.

This also included an indicative cost for traffic signal ducting around the junction as well as approximately 600m of traffic ducting to connect to the existing network at the nearby University of Limerick entrance. It is currently assumed (and based on underground surveys) that there is no local connection available.

4.5.2.3 Road User Safety

The provision of new footpaths, full cyclist provision and the signalisation of the junction will significantly improve safety for road users and in particular for pedestrians traversing the roadways.

This is largely due to the design catering for all turning and crossing movements of pedestrians and cyclists via signalised crossings, designed as per relevant guidance documents.

As per the design guidance with the National Cycle Manual (NCM), cyclists have the opportunity to stay to the left of the approach, move into a stacking area at the mouth of the side or cross road, and wait for the green phase, or alternatively to make use of shared space and cross at toucan crossings. This arrangement avoids right turning cyclists needing to weave across busy traffic lanes or getting stuck between opposing streams of traffic in a junction. It also permits straight ahead and left turning cyclists to continue along the main road unobstructed and to remain protected. This is the arrangement on all approaches of the new junction.

4.5.2.4 Policy Integration

The existing public transport network to and through this junction is described in **Section 2**, noting the NTA strategic proposals.

In developing this Option, the increased frequency and improving bus priority on straight and right turn movements were addressed as follows:

- Provision of dedicated bus lanes both east and west-bound on Plassey Park Road approaching the junction catering for the east-west movement as well as the right turn onto Plassey Road via a right turn traffic lane, and allowing for a tie-in with future bus lanes to be provided along Plassey Park Road to/from University of Limerick.
- Provision of dedicated northbound bus lane on Plassey Road on approach to the junction enabling the left turn onto Plassey Park Road.
- Converting existing kneeling/indented bus stop into an in-line bus stop (Option 2 within the NCM) to remove the requirement for buses to enter a lay-by and then move back out into moving traffic. Currently the frequency of the 304 and 304A is approximately every 30 minutes however this is likely to increase, and the proposed design is capable of facilitating bus frequencies of every 2 minutes, as well as removing the conflict of cyclists and buses.
- There are a variety of ways in which bus priority can be further achieved in this scenario through the use of smart technology in conjunction with the proposed design. The most common types involve either bus mounted transponders or separate detection loops. Priority for buses can be provided within linked signals in an UTC system in certain circumstances. This can be achieved by weighting links with significant bus flows in the time plans, the Plassey Park Road eastbound right turn movement in this case. Adaptive systems such as SCOOT and SCATS can also give priority to buses within their operation. Coordination with the council's traffic department will determine appropriateness of such systems.

It is therefore considered that this option represents a significant improvement on the existing situation in terms of integration with transport policies relating to public transport.

4.5.2.5 Environmental Impacts

The following key features of Option 1 have the potential to give rise to effects on the Natura 2000 sites within the zone of influence:

- Construction works including excavation, paving, landscaping etc.;
- Construction traffic and machinery;
- Greenfield development pertaining to the construction of a new (160m) section of roadway and the widening of existing road/footpaths and subsequent potential for habitat loss;
- Provision of increased area of hardstanding resulting in increased surface-water run-off to the River Shannon.

As no change in the composition of this surface water run-off (other than volume) is expected to occur during the operational phase of the proposed development, when compared to the existing scenario, the proposed development is not predicted to result in a significant negative effect on the Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA, or their features of conservation interest.

The overall works during the construction period is approximately 16,800m², which includes approximately 1,160m² of new full depth road construction in the vicinity of the catchment which drains to the existing surface water network along Troy Studios Road, discharging to the River Shannon.

In terms of architectural conversation impacts, this option will have no impact on the known RMP sites (recorded archaeological sites), any protected structures listed in the Cork County Development Plan 2014, structures listed in the National Inventory of Architectural Heritage (NIAH) and Architectural Conservation Areas (ACA).

4.5.2.6 Land Use Impact

For reference, **Figure 7** shows an indicative land owner map of the area, based on available land registry information, with Folio Numbers and ownership shown for various key plots.

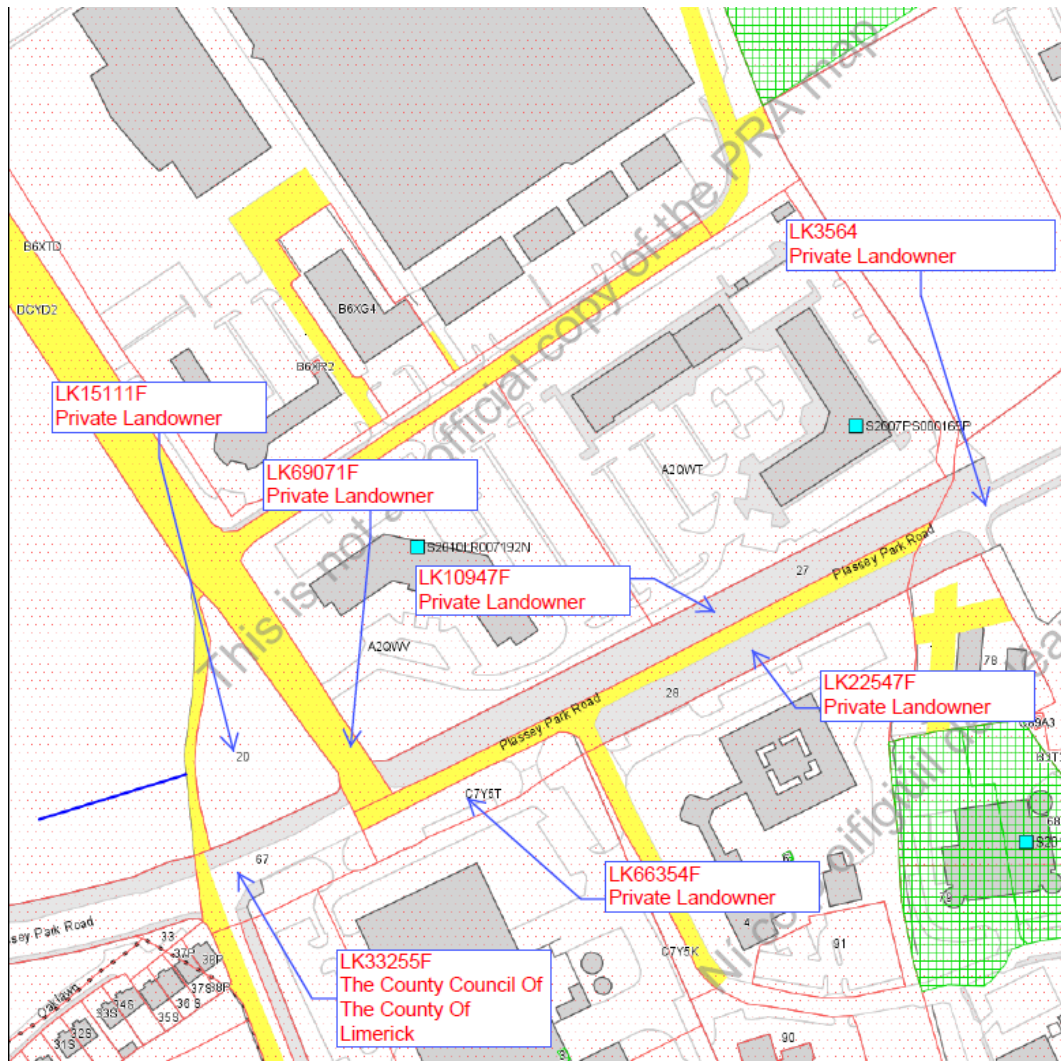


Figure 7: Land Registry information of folios in the immediate area

There is a requirement for land take from the University of Limerick (UL) privately owned lands to the north of Plassey Park Road, in order to construct the new section of roadway stemming from the new junction, and to connect the existing car park of Hamilton House to this roadway (~1,771m² in Folio LK15111F). An additional section of land north of the existing entrance to the Maguires Pitches UL carpark is also required to tie the road into the existing Troy Studios Road (~128 m² in Folio LK69071F). At the west side of the scheme, there is a need to widen Plassey Park Road on the northern side, which will result in a section of the UL owned lands to be acquired (~60m² in Folio LK15111F). In total the proposed scheme results in approximately 1,959m² of UL owned lands being required. There is also approximately 1,850m² of UL owned lands remaining between the new road link and the existing Troy Studios Road, the treatment of which is yet to be determined.

There is a requirement to widen Plassey Park Road (eastern arm) into privately owned lands to the north [approximately 522m² in LK22547F], and into privately owned lands to the south [approximately 568m² in Folio LK66354F].

An existing entrance to the Kilmurry Business Centre car park which is located to the east of the new proposed cross-roads (indicated in **Figure 8**) is to be restricted to left-in / left-out only.

The traffic counts indicated approximately 21 pcus entering and leaving the entrance throughout the day, and the modelling showed that the rerouting of these through the alternative entrance to the car park to the east from Lonsdale Road was not detrimental to the junction operation.



Figure 8: Location of existing car park access from Plassey Park Road (© Google 2020)

The realignment of the existing Troy Studios Road to form the cross-roads will require alterations to the recently constructed entrance into the University of Limerick Sports Pitches Car Park, as well as an extension to the access/egress of the Hamilton House Car Park. Indicative designs of same are shown in **Figure 9**, subject to further design development and agreement with relevant landowners.

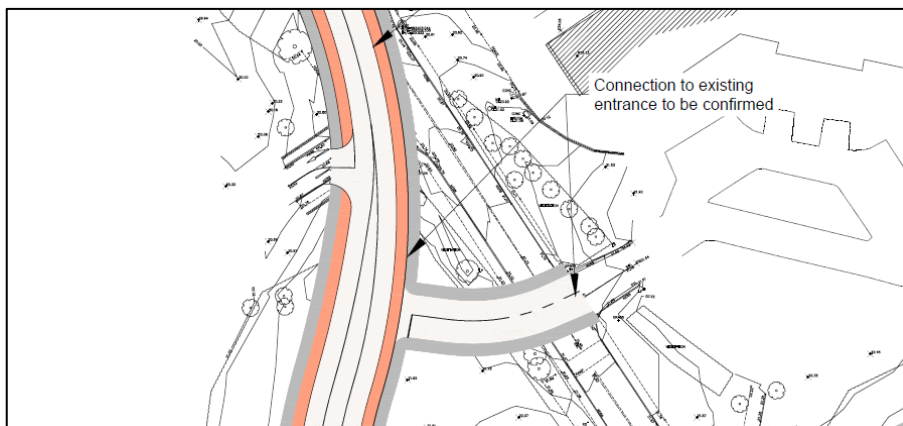


Figure 9: Potential alterations required to existing accesses off Troy Studios Road

There is a requirement to widen Plassey Road into privately owned lands to the east - between Plassey Park Road and Dun an Oir [~997m² in Folio LK66354F] and south of Dun an Oir [~17.6m² in Folio LK66354F].

4.5.3 Option 2: Existing Junction Upgrade Works

Option 2 includes the retention of the existing road orientation, with both junctions operating as signalised instead of priority junctions, with the addition of turning lanes for all right turning movements.

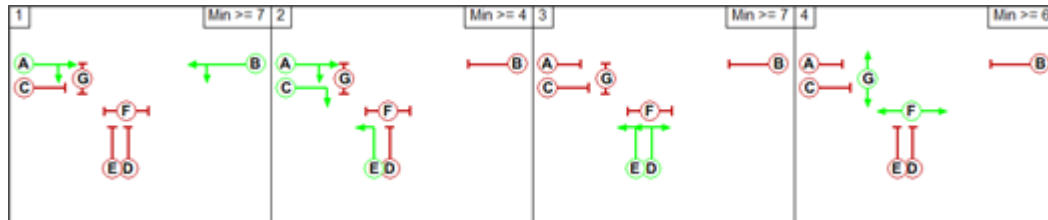
4.5.3.1 Operational Performance

As part of the design of this option, consideration needed to be given to the treatment the existing entrance to the Kilmurray Business Centre car park which is located between the two subject junctions. The junction and its location in plan are described in **Figure 8**.

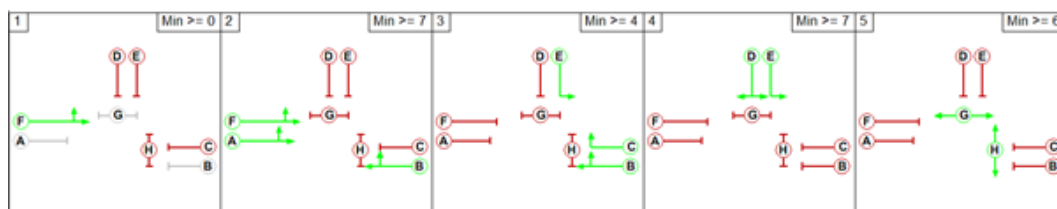
As in **Section 4.5.2.1**, this junction is to be restricted to left-in/left-out as part of the works in this option.

The staggered layout with straight and right on, and the signal staging set for efficient flow of traffic, operates well within capacity. This arrangement is indicated below, with a cycle time of 100s in the opening year.

Plassey Road/ Plassey Park Road Junction



Troy Studios Road / Plassey Park Road Junction



The chosen scenario for the staggered option sees a **PRC of 34% in the AM**, and **37% in the PM**, in the opening year.

Under Option 2, the new junction experiences a significant improvement in operational performance compared to the existing scenario with a maximum DoS of 67%, occurring in the AM peak on Plassey Park Road Eastbound. There is a high level of residual capacity on all arms in the AM Peak and in PM peak. The full breakdown is shown in **Table 5**.

Table 5: Opening Year Operational Capacity of Option 2

Approach	Movement	AM		PM	
		DoS	Queue	DoS	Queue
Plassey Road/ Plassey Park Road Junction					
Plassey Park Road Eastbound	St (Bus)	2%	<1	<1%	<1
	St/R	55%	9	63%	5
Plassey Road	L	50%	4	63%	3
	R	60%	6	32%	1
Plassey Park Road Westbound	St (Bus)/L	9%	1	43%	7
	St	59%	7	42%	7
Troy Studios Road / Plassey Park Road Junction					
Plassey Park Road Eastbound	St (Bus)	2%	<1	2%	<1
	St/L	67%	6	29%	3
Troy Studios Road	L/R	32%	2	64%	9
Plassey Park Road Westbound	St/R	51%	6	65%	12
	St (Bus)	1%	<1	1%	<1

Note: L = Left; R = Right; St = Straight Ahead, Queue is Mean Maximum Queue (in pcus)

In design year of 2035, with a 110s cycle time the modelling showed all junction to operate well within capacity.

The modelling of the 2035 scenario saw a PRC of 24% in the AM and 27% in the PM. As shown in **Table 6**, the anticipated maximum DoS was shown as 73% occurring on Plassey Park Road westbound in the AM peak.

Table 6: 2035 Operational Capacity of Option 2

Approach	Movement	AM		PM	
		DoS	Queue	DoS	Queue
Plassey Road/ Plassey Park Road Junction					
Plassey Park Road Eastbound	St (Bus)	2%	<1	<1%	<1
	St/R	58%	9	69%	6
Plassey Road	L	53%	4	63%	4
	R	68%	8	39%	2
Plassey Park Road Westbound	St (Bus)/L	9%	1	45%	8
	St	63%	12	47%	8
University Business Complex / Plassey Park Road Junction					
Plassey Park Road Eastbound	St (Bus)	2%	<1	2%	<1
	St/L	70%	8	31%	3
University Business Complex	L/R	41%	2	70%	11
Plassey Park Road Westbound	St/R	73%	8	71%	15
	St (Bus)	1%	<1	1%	<1

Note: L = Left; R = Right; St = Straight Ahead, Queue is Mean Maximum Queue (in pcus)

4.5.3.2 Capital Cost

This option requires new road construction and signalisation of the new junction and includes the construction of bus lanes, off-road cycle tracks, installation of traffic signals, provision of new footpaths, resurfacing and new lining and signage, as well as minor diversions to existing Eir infrastructure.

A high-level cost assessment was carried on the initial design of Option 2 to determine the order of magnitude cost of the works requirement for comparative assessment.

This included an indicative cost received from Eir regarding potential alterations to the infrastructure, final costing for this item will be determine through further design and consultation.

This also included an indicative cost for traffic signal ducting around the junction as well as approximately 600m of traffic ducting to connect to the existing network at the nearby University of Limerick entrance. It is currently assumed (and based on underground surveys) that there is no local connection available.

4.5.3.3 Road User Safety

The provision of a new footpaths, full cyclist provision and the signalisation of the junction will significantly improve safety for road users and in particular for pedestrians traversing the roadways.

This is largely due to the design catering for all turning and crossing movements of pedestrians and cyclists via signalised crossings, designed as per relevant guidance documents.

In line with the “stay-left-to-go-right” approach within the NCM, the design allows right-turning cyclists on Plassey Park Road to stay to the left of the approach, move into a stacking area at toucan crossings, and wait for the appropriate green phase. This arrangement avoids right turning cyclists having to weave across busy traffic lanes or getting stuck between opposing streams of traffic in a junction. It also permits straight ahead cyclists to continue along the main road unobstructed. This is the arrangement on the eastbound and westbound approaches to the new junction.

On the minor arms the arrangement has been designed so that cyclists can make use of shared space and cross at toucan crossings if turning right, or safely join the west/east bound cycle track protected from traffic.

4.5.3.4 Policy Integration

The existing public transport network to and through this junction is described in **Section 2.5**.

The design requirements for bus provision are as described in Option 1 (**Section 4.5.2.4**).

In developing this Option, the increased frequency and improving bus priority on straight and right turn movements were addressed as follows:

- The provision of dedicated bus lanes on the east, west, and north bound approaches to the junction(s), with the benefits of same as described in Option 1 above.
- Converting existing kneeling/indented bus stop into an in-line bus stop, with benefits as described in Option 1.

There are a variety of ways in which additional bus priority can be achieved in this scenario through the use of smart technology, as described in Option 1.

It is therefore considered that this option represents a significant improvement on the existing situation in terms of integration with transport policies relating to public transport.

4.5.3.5 Environmental Impacts

The following key features of Option 2 have the potential to give rise to effects on the Natura 2000 sites/features of conservation interest within the zone of influence:

- Construction works including excavation, paving, landscaping etc.;
- Construction traffic and machinery;
- Greenfield development pertaining to the proposed widening of existing road/footpaths and subsequent potential for habitat loss, and
- Provision of increased area of hardstanding resulting in increased surface-water run-off to the River Shannon.

As no change in the composition of this surface water run-off (other than volume) is expected to occur during the operational phase of the proposed development, when compared to the existing scenario, the proposed development is not predicted to result in a significant negative effect on the Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA, or their features of conservation interest.

The overall works area during the construction period is approximately 16,120m², which includes approximately 300m² of new full depth road construction in the vicinity of the catchment which drains to the existing surface water network along Troy Studios Road, discharging to the River Shannon. However, the majority of the works are within the catchment which drains to the existing surface water network along Plassey Park Road, falling eastwards and westwards and connecting in a larger network before potentially discharging to the River Shannon.

In terms of architectural conversation impacts, this option will have no impact on the known RMP sites (recorded archaeological sites), any protected structures listed in the Cork County Development Plan 2014, structures listed in the National Inventory of Architectural Heritage (NIAH) and Architectural Conservation Areas (ACA).

4.5.3.6 Land Use Impact

There is a requirement for approximately 537m² [~15m² in Folio LK66354F and 522m² in Folio LK15111F] of land from the western side of the University of Limerick owned roadway (Troy Studios Road). It is also proposed to widen Plassey Park Road, which will require approximately 62m² [In Folio LK15111F] of University of Limerick owned lands from the northern side of the road. The majority of this land consists of existing grass verge, vegetation and footpath.

There is also a requirement to widen Plassey Park Road and Troy Studios Road into privately owned lands to the north-east [approximately 744m² from two separate Folios: ~192m² from Folio LK47393F; and 552m² from Folio LK22547F].

Along with the land impact noted, as described in herein, the existing entrance to the Kilmurry Business Centre car park is to be restricted to a left-in / left-out only. The traffic counts indicated approximately 21 pcus entering and leaving the entrance throughout the day, and the modelling showed that the rerouting of these through the alternative entrance to the car park to the east from Lonsdale Road was not detrimental to the junction operation.

There is widening on the southern side of Plassey Park Road into privately owned lands to the south [approximately 568m² in Folio LK66354F]. Along with the requirement to widen Plassey Road into privately owned lands to the east - between Plassey Park Road and Dun an Oir [~429m² in Folio LK66354F] and just south of Dun an Oir [~17.6m² in Folio LK66354F].

4.6 Options Assessment

Based on the assessment of the route options, the relative ranking of options is summarised in **Table 7** and **Table 8**. The results have been presented with the existing situation included and excluded in the comparative assessment, in order to demonstrate a robust assessment of the options against each other and against the do-nothing scenario.

Table 7: Options Assessment Summary including Option 0

Assessment Criterion	Assessment Sub-Criterion	Option 0	Option 1	Option 2
Economy	Operational Performance	Red	Light Green	Green
	Capital Cost	Green	Red	Yellow
Integration	Policy Integration	Red	Green	Green
Safety	Road User Safety	Red	Green	Green
Environment	Environmental Impact	Green	Yellow	Yellow
	Land Use Impact	Green	Red	Yellow

Table 8: Options Assessment Summary excluding Option 0

Assessment Criterion	Assessment Sub-Criterion	Option 1	Option 2
Economy	Operational Performance	Yellow	Light Green
	Capital Cost	Yellow	Light Green
Integration	Policy Integration	Yellow	Yellow
Safety	Road User Safety	Yellow	Yellow
Environment	Environmental Impact	Yellow	Light Green
	Land Use Impact	Red	Green

In terms of Operational Performance both Option 1 [Opening Year PRC of **18% in the AM**, and **27% in the PM**] and Option 2 [Opening Year PRC of **34% in the AM**, and **37% in the PM**] present significant advantages over the existing situation, with Option 2 showing more residual capacity in both the AM and PM peaks. It is therefore considered that Option 2 offers advantages over Option 1 when considered holistically.

In the comparative cost assessment Option 2 was shown to be cheaper than Option 1 largely due to the reduced extents of full road construction required and the less extensive utility diversions required, and therefore has scored higher on Capital Cost.

In terms of Road User Safety, as with Operational Performance, both options score highly against the existing situation due to the significantly improved environment for all road users, and due to the comparably high level of safety in both options, they have been scored as neutral.

Considering both Option 1 and Option 2 include measures which significantly increase the bus provision at the key junction of Plassey Park Road and Plassey Road to the same extent, both are considered score higher than the existing scenario, yet are comparable and have therefore been scored as neutral.

As for the Environmental Impact, the high-level assessment of the potential for significant effects to arise on Natura 2000, both options were shown to be comparable in the operational phase. However, due to the smaller works area and extent of construction works, Option 2 has been scored higher than Option 1. A full AA and EIA Screening exercise has been carried out to assess the impacts further on the preferred option and should be read in conjunction with this report.

Option 1 will also require significantly more land take than Option 2 and will impact upon a number of additional existing entrances and boundaries, and therefore Option 2 has been scored higher in terms of Land Use Impact.

4.7 Preferred Option

Based on the assessment undertaken, while the options are comparable in many aspects. **Option 2** is preferred for the following reasons:

- It has been estimated to involve a lower capital cost, while achieving a better operational performance. This therefore represents positive value for money;
- It provides a significant improvement in terms of bus provision over the do-nothing scenario;
- It provides a significantly safer environment for vulnerable road users such as pedestrians and cyclist than the do-nothing scenario;
- It is considered to potentially involve a lower risk to the environment in both operational and construction phases; and
- It has the lower impact on existing land use and involves less land take when compared to Option 1.

Based on this assessment the overall scheme design was developed with the staggered junction arrangement as described herein.

5 Emerging Overall Proposed Scheme

5.1 Design Description

Based on the scheme proposals identified in Section 3.2, a number of scheme layout iterations were developed and an emerging preferred proposal for the study area was developed through the design process. The main features of the proposed scheme are listed below and are shown in drawings T0100-01 and T0100-02 which accompany this planning application:

- On Plassey Park Road:
 - Convert the existing kneeling bus stop (approximately 90m west of the Plassey Road junction) to an in-line bus stop, and to extend the right-turn lane on Plassey Park Road to allow buses to enter the right-turn lane directly from the bus stop.
 - Additional bus lanes to be introduced on both sides of Plassey Park Road.
 - Cycling lanes are to be constructed on both sides of the road. These will vary between on road cycle lanes and raised cycle lanes.
 - Off-line waiting area for right-turning cyclists to cross at toucan crossing to be installed at both junctions.
 - Both the Plassey Park Road / Plassey Road junction and the Plassey Park Road / Troy Studios Road to operate as signalised junctions. It was determined through further design development, and with consideration for Stage 1 Road Safety Audit recommendations, that all three arms of each junction were to have a signalised toucan crossing. Traffic modelling demonstrated that this arrangement did not significantly impact the operation of the signals.
 - A cantilever bus priority traffic signal to be provided in advanced of the Plassey Park Road/Troy Studios Road junction.
 - An additional right-turn lane is to be constructed on Plassey Park Road to turn onto Troy Studios Road.
 - Widening of the existing road/footpath into existing roadside grassed areas/vegetation.
 - Proposed scheme to tie-in with future bus lane provision on Plassey Park Road.
- On Plassey Road:
 - A new bus stop to be constructed on the west side of Plassey Road. A bus lane is also to be constructed on the west side of the road ending at the Plassey Park Road / Plassey Road junction and starting approximately 130m south.
 - On the east side of the road a bus lane which is approximately 170m in length is to be constructed which ends at the Killmurry Roundabout.
 - Additional and/or upgraded pedestrian / cycle facilities are to be constructed on both sides of Plassey Road.
 - Side road junctions are to be upgraded to allow safer crossing of pedestrians and cyclists.

- Formalised access/egress from business park with widening and formalisation of Dun an Oir junction to L1118.
- New block wall / fenceline constructed to tie in with existing and form new boundary on the east side of Plassey Road.
- On the Troy Studios Road:
 - On road cycle lane to be constructed on both sides of the road.
 - Footpath to be constructed on both sides of the road.
 - Additional lane to be constructed on Troy Studios Road to separate vehicles turning right and left.

5.2 Public Lighting Design

5.2.1 Existing

Within the study area, Plassey Park Road and the adjacent footpaths are illuminated by roadway lighting columns and luminaires on the north and south side of the roadway at approximately 50m intervals.

Lighting columns on Plassey Road are present on the east and west side at key locations and junctions. The existing roundabout has a significant offering of lighting columns.

Lighting poles on Troy Studios Road are located at approximately 50m intervals on the west side of the road.

5.2.2 Proposed Design

A proposed street lighting strategy shall be developed for the existing streets, footpaths and public spaces within the study area in line with the scheme proposals.

The lighting design shall cater for new lighting of the roadway if the existing provision is deemed insufficient for the proposed uses, in addition to lighting being provided to ensure a continuity of illumination along footpaths and within public areas.

The lighting design and installation shall be in accordance with the specific lighting and electrical items set out the following National Standards and guides:

- EN 13201: 2014 Road Lighting (all sections);
- Volume 1 - NRA Specification for Roadworks, Series 1300 & 1400;
- Volume 4 - NRA Road Construction Details, Series 1300 & 1400;
- IS EN 40 – Lighting Columns;
- Street Lighting Specification(s) in accordance with CCC;
- Institution of Lighting Professionals “GN01 Guidance Notes for Reduction of Obtrusive Light”; and

- Institution of Lighting Professionals “Code of Practice for the Design of Street Lighting”.

5.2.3 Design Details

A full lighting design will be completed as part of detailed design and agreed, as required, by Limerick City and County Council.

Columns shall be rooted type and shall be manufactured to European stand EN40–Lighting Columns. Light fittings will be in keeping with the existing provision.

5.3 Drainage Design

5.3.1 Existing

The existing drainage regime within the site extents has been assessed through reviews of existing record drawings, on-site GPR (ground penetrating radar) survey results, and on-site manhole inspections and confirmation.

There are a number of gullies on both sides of Troy Studios Road. A 450mm concrete pipe travels north before appearing to discharge to the River Shannon.

Surface water on Plassey Park Road, east of Plassey Road, is collected in various gullies along the road before travelling east through 150mm uPVC collector pipes. Although the record drawings initially indicated this network drained towards Troy Studios Road, on-site inspection confirmed that much of this network continues east via a collector drain along Plassey Park Road. However, there are several gullies on the northern side of the road which are connected to the Troy Studios Road network which appears to flow into the River Shannon.

Surface water on Plassey Road is collected by gullies along the road, connecting to the existing network which then follows the road north until it reaches the Plassey Park Road network. The system then travels east and continues east along Plassey Park Road as described above.

Along Plassey Park Road, west of Plassey Park, the surface water is collected and drains into a 450mm concrete pipe travelling west.

5.3.2 Proposed Design

The proposed scheme’s stormwater drainage infrastructure design shall incorporate considerations, including:

- compliance with the relevant standards;
- water treatment measures to maintain water quality in the vicinity of the River Shannon;
- understanding of the site topography and catchment breakdown;
- determination of the network requirement;
- determination of overland flow routes and cut-off drainage requirements;

- determination of spare capacity required for the future; and
- assessment and design of suitable sustainable urban drainage features.

All works will be carried out in accordance with the Greater Dublin Strategic Drainage Study and to LCCC standards.

5.3.3 Design Details

A full drainage design will be completed as part of detailed design and agreed, as required, by Limerick City and County Council.

5.4 Construction Methodology

The proposed development is anticipated to be constructed over a four-month period. The development is proposed to be constructed on the following basis:

- Set up site compound;
- Establish temporary traffic management zones on Troy Studios Road and Plassey Park Road;
- Carry out works on the Troy Studios Road;
- Carry out works on northern side of Plassey Park Road initially then focussing on the southern side;
- Establish new footpaths and road alignments with traffic signals installed but not operational until instruction is given;
- Establish temporary traffic management zones on Plassey Road;
- Works then to be carried out on Plassey Road to construct new bus lane with appropriate temporary traffic management zones established, and
- Final snagging and completion

The following is the typical construction methodology expected for the road widening works - taking Troy Studios Road as a typical example.

1. With reference to **Figure 10**, initially the Contractor shall set up the site extents for off-line work, leaving existing kerb and road-side gullies in place. The works area shall generally be to back of proposed footpath or existing boundary. The Contractor shall carry out required excavations for the proposed footpath, proposed cycle lanes/tracks, road widening, and any off-line utilities.

The expected excavation depths would be c. 500mm for footpaths, and c. 800mm for cycleways and roadways.

Appropriate traffic management will be required in this period to ensure pedestrian and cyclist route through and around the works are maintained which may require reduction of roadway widths to provide temporary routes.

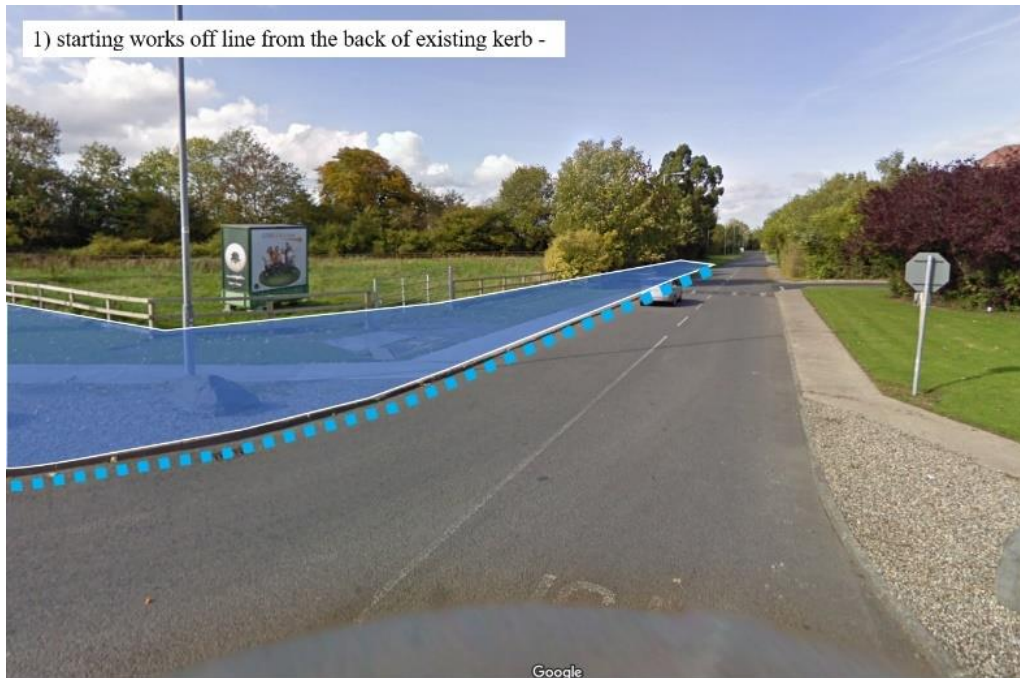


Figure 10: Typical Construction Phase 1 © Google 2020

2. With reference to **Figure 11**, the Contractor shall then construct the proposed footways and cycle ways up to back of proposed road edge. The remaining excavation shall be left for future tie-in with existing pavement and for future installation of new gullies.

Pedestrian and cyclist temporary routes to be maintained until such time that the proposed footpaths and cycle routes are clear from works and suitable for use.



Figure 11: Typical Construction Phase 2 © Google 2020

3. With reference to **Figure 12**, the Contractor shall then move on-line and break out existing kerbs and gullies and begin excavating existing pavement in order to carry out the tie-in to new pavement and prepare for any recambering and/or resurfacing works required to the existing pavement.

In this interim period before new gullies are installed, the contractor will be required to manage the surface water within the site rather than through the drainage network. Due to the soil conditions the water is likely to infiltrate however if the excavating needs to be cleared of water, the water can be pumped out and removed off site.

Pedestrian and cyclist temporary routes to be maintained until such time that the proposed footpaths and cycle routes are clear from works and suitable for use.



Figure 12: Typical Construction Phase 3 © Google 2020

4. With reference to **Figure 13**, the Contractor shall then construct the new pavement, tying in with existing retained. Final works shall include surface course and installation of new gullies along the road edge.

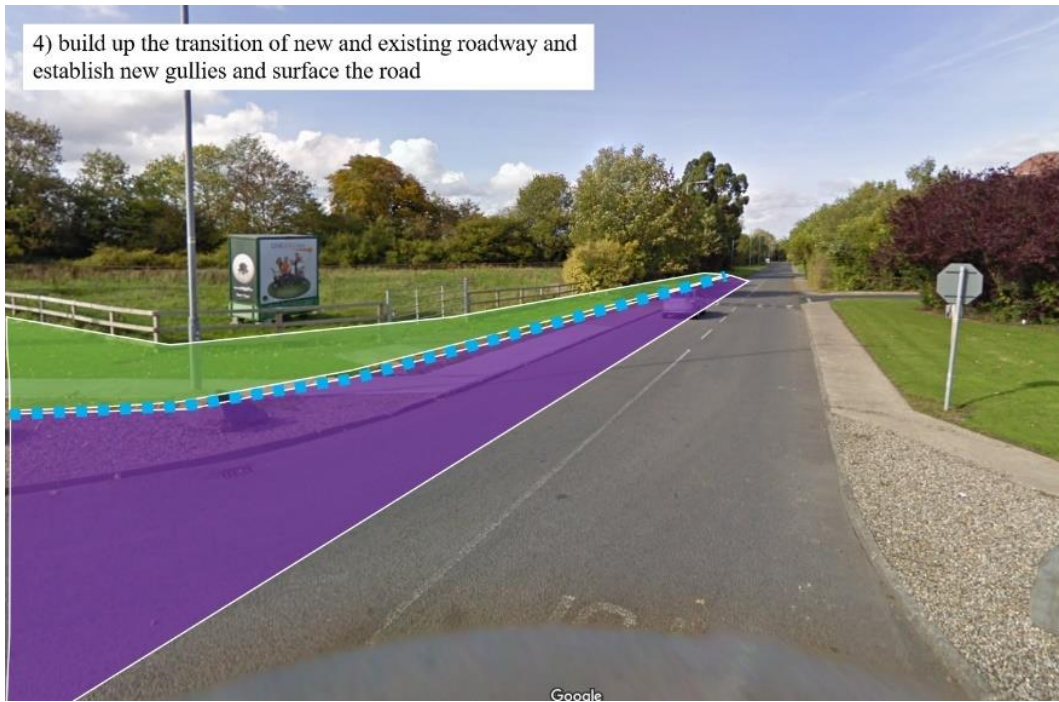


Figure 13: Typical Construction Phase 4 © Google 2020

This is the envisaged sequencing however the Main Contractor may propose an alternative, to be approved.

6 Conclusion

This Part VIII report has been prepared in accordance with Part VIII of the Planning and Development Regulations, 2001 as amended. It sets out the existing situation in terms of traffic management and pedestrian and cycle facilities at the Plassey Park Road junctions.

The preliminary design for the scheme is a staggered set of signalised T-junctions upgrading the existing priority junctions at the Troy Studios Road and Plassey Road on Plassey Park Road, with new bus lanes added throughout. The scheme provides improved pedestrian and cyclist crossing facilities, which the existing junction is currently lacking.

Traffic modelling shows operational capacity of the junctions will be significantly improved with the interventions.

The appraisal presented in Section 4 clearly identifies that the proposed scheme is the preferred of the two potential alternatives assessed, as well as offering many benefits over the existing situation.