

Clifton Scannell Emerson & Associates

Barnhill SHD

Stage 1 Road Safety Audit

# Clifton Scannell Emerson & Associates

## Barnhill SHD

### Stage 1 Road Safety Audit

<b>Document Ref:</b>	<b>P22-091-RSA-PD-RP-001</b>
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Rev	Prepared By	Reviewed By	Approved By	Issue Date	Reason for Revision
5.0	PJM/MAH	PJM	PJM	5 <sup>th</sup> July 2022	Revised unit number
4.0	PJM/MAH	PJM	PJM	27 <sup>th</sup> June 2022	Updated Final
3.0	PJM/MAH	PJM	PJM	25 <sup>th</sup> June 2022	Final
2.0	PJM/MAH	PJM	PJM	24 <sup>th</sup> June 2022	Updated drawing
1.0	PJM/MAH	PJM	PJM	21 <sup>st</sup> June 2022	Draft Report

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# 1 Introduction

## 1.1 General

This report results from a Stage 1 Road Safety Audit on the proposed Barnhill SHD carried out at the request of Mr Geoff Emerson of Clifton Scannell Emerson & Associates.

The members of the Road Safety Audit Team are independent of the design team, and include: -

**Mr. Peter Monahan**

(BE MSc CEng FIEI RSACert)  
Road Safety Audit Team Leader

**Mr. Mazen Al Hosni**

(BEng, MIEI)  
Road Safety Audit Team Member

The Road Safety Audit took place during June 2022 and comprised an examination of the documents provided by the designers (see Appendix B). In addition to examining the documents supplied the Road Safety Audit Team visited the site of the proposed measures on the 14<sup>th</sup> June 2022. Weather conditions during the site visit were dry and the road surface was dry. Traffic volumes during the site visit were low to moderate, pedestrian and cyclist volumes were low and traffic speeds were considered to be generally within the posted speed limit.

Where problems are relevant to specific locations these are shown on drawing extracts within the main body of the report and their locations are shown in Appendix D. Where problems are general to the proposals sample drawing extracts are within the main body of the report where considered necessary.

This Stage 1 Road Safety Audit has been carried out in accordance with the requirements of GE-STY-01024 - Road Safety Audit (December 2017), contained on the Transport Infrastructure Ireland (TII) Publications website.

The scheme has been examined and this report compiled in respect of the consideration of those matters that have an adverse effect on road safety and considers the perspective of all road users. It has not been examined or verified for compliance with any other standards or criteria. The problems identified in this report are considered to require action in order to improve the safety of the scheme and minimise collision occurrence.

If any of the recommendations within this road safety audit report are not accepted, a written response is required, stating reasons for non-acceptance. Comments made within the report under the heading of Observations are intended to be for information only. Written responses to Observations are not required.

## 1.2 Items Not Submitted for Auditing

Details of the following items were not submitted for audit, therefore no specific problems have been identified at this stage relating to these design elements, however where the absence of this information has given rise to a safety concern it has been commented upon in Section 3: -

- Landscaping
- Vehicle swept paths
- Visibility splays

## 2 Project Description

### 2.1 General

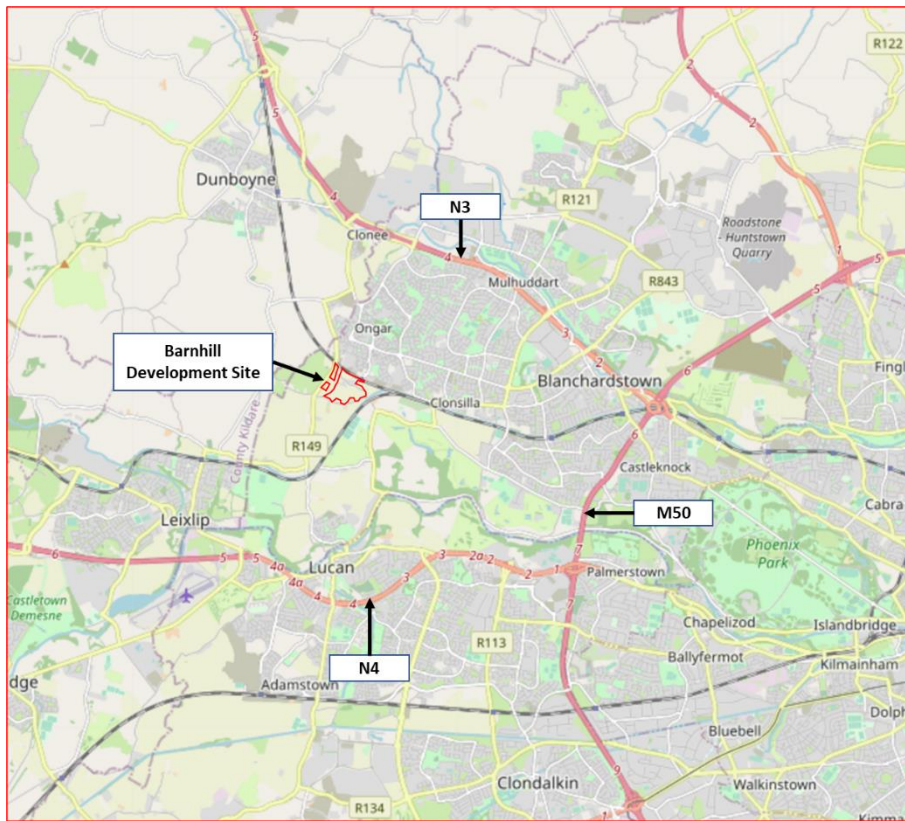


FIGURE 2-1: LOCATION PLAN (SOURCE: WWW.OPENSTREETMAP.ORG)

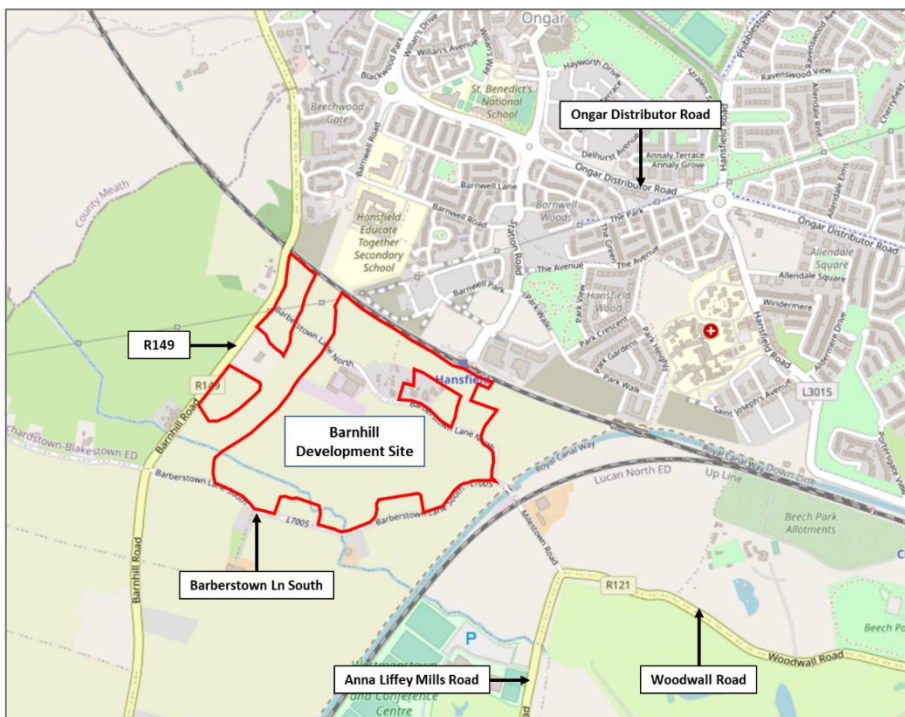


FIGURE 2-2: LOCATION PLAN (SOURCE: WWW.OPENSTREETMAP.ORG)

The proposed development will consist of the demolition of the existing vacant industrial buildings and the construction of 1,243 residential units, approximately 3,174m<sup>2</sup> of commercial and community facilities and ancillary development.

The commercial and community development will include:

- Creche of 942m<sup>2</sup> with capacity for approximately 210 children.
- Medical centre (GP / Dental practice) of 344m<sup>2</sup> with eight consulting rooms.
- Convenience retail unit of 370m<sup>2</sup>
- Five independent retail / retail service units ranging in size from 57m<sup>2</sup> to 127m<sup>2</sup> sqm, with capacity to amalgamate some of the units if required.
- A Café of 158m<sup>2</sup>
- A Community Space of 359m<sup>2</sup> able to accommodate a range of activities, including providing for multi-denominational worship, fitness classes, community meetings etc.
- An Office Hub of 501m<sup>2</sup> to provide hot-desk and office support facilities to facilitate hybrid working.
- Provision of an access Plaza to Hansfield Train Station, including provision for a commuting bike storage area.
- Development of a cycle/pedestrian priority route along Barberstown Lane North (L-7010-0), with vehicle use restricted to local access only.
- Land set aside for school to accommodate a minimum of 16 classrooms

The residential units consist of a mix of unit types as detailed in Table 1. Buildings range in height from 2-storeys to 12-storeys.

**TABLE 2.1: MIX OF UNIT TYPES**

Unit Type	No. of Units	% of total Development	Total SQM	Average SQM per unit type.
<b>1 bed apartment</b>	148	11.9%	7,610	51
<b>2 bed apartment</b>	589	47.4%	46,396	79
<b>3 bed apartment</b>	63	5.1%	6,521	104
<b>4 bed apartment</b>	4	0.3%	594	148
<b>1 bed duplex</b>	5	0.4%	296	59
<b>2 bed duplex</b>	20	1.6%	1,736	87
<b>3 bed duplex</b>	92	7.4%	11,010	120
<b>3 bed house</b>	286	23.0%	32,607	114
<b>4 bed house</b>	36	2.9%	4,989	139
<b>TOTALs</b>	<b>1,243</b>	<b>100%</b>	<b>111,759</b>	<b>90</b>

## 2.2 Development Areas

The proposed development is split into small areas as follows: -

- Link Road West
- Link Road East
- Railway Quarter
- Station Plaza
- Station Quarter South
- Village Centre Residential
- Barnhill Cross
- Barnhill Crescent
- Barnhill Stream
- Parkside

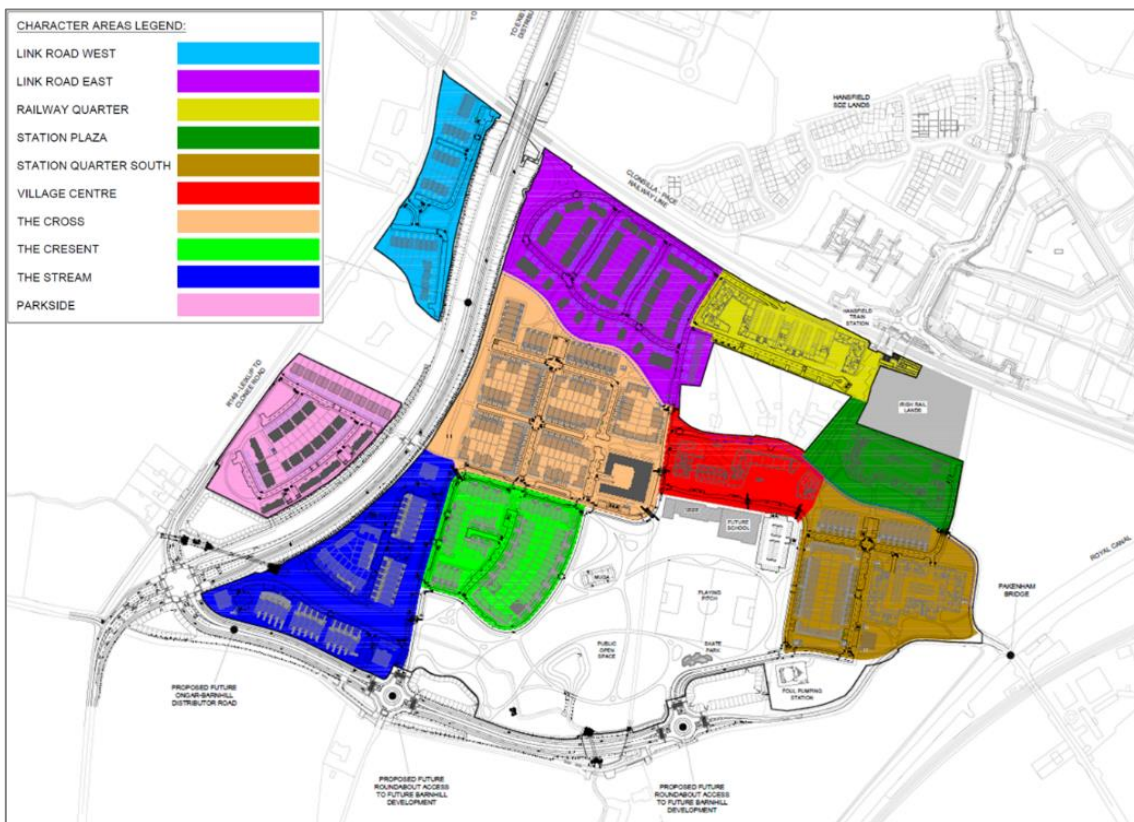


FIGURE 2-3: DEVELOPMENT AREAS

## 2.3 Proposed Road Network

The proposed development would include four vehicular accesses, two from the Clonee Road (R149) and two from the proposed Ogar-Barnhill Distributor Road. The road network would comprise of a single primary route (spine road) that runs from two accesses along the proposed Ogar-Barnhill Distributor Road, and multiple secondary routes, that link to the spine road, and which would provide access to the residential units.

The spine road would be a single carriageway and include segregated footpath and cycle track along both sides. The secondary routes would consist of shared carriageways (vehicle/ cyclist shared carriageway) and footpaths.

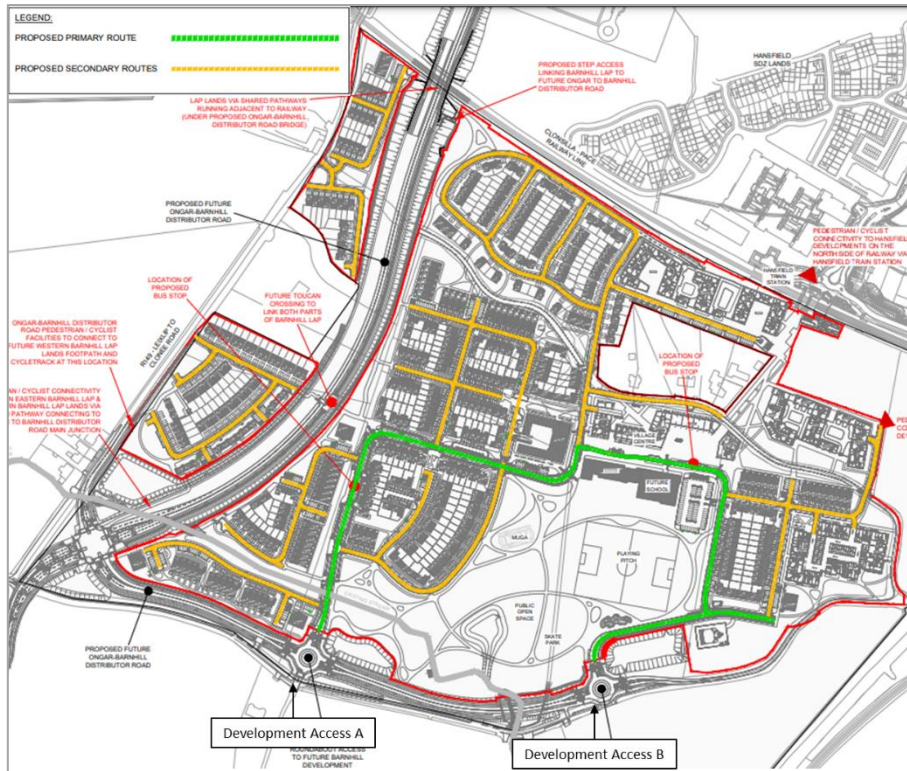


FIGURE 2-4: PROPOSED ROAD NETWORK

## 2.4 Non-Motorised Road User Routes

A network to accommodate non-motorised road users (e.g. pedestrians and cyclists) would extend through the entire development, along all roads and through the proposed parks. The footpaths would have a minimum width of 2.0 metres and the cycle tracks would be 1.75 metres wide. The areas where pedestrians and cyclists would be accommodated within a shared space would be 3m to 4m wide. Two pedestrian/cycle links would be provided across the proposed Ongar-Barnhill Road to provide connection between the residential properties on either side of this road, one adjacent to the railway in the northern section of the site and one via a signalised crossing of the Distributor Road between Parkside and the eastern portion of the site.

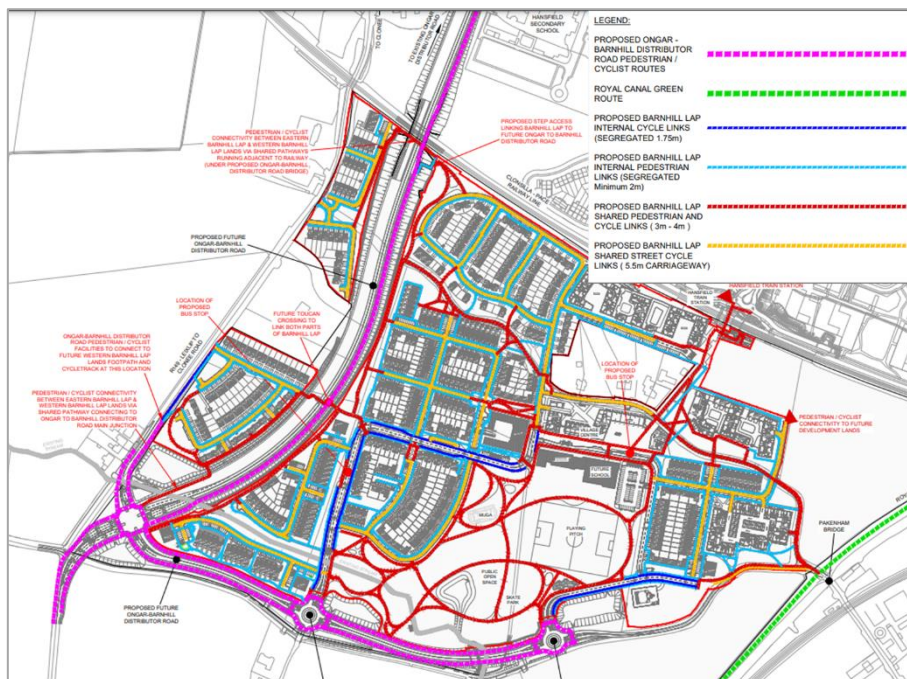


FIGURE 2-5: NMU ROUTES



Where raised-tables or ramps are proposed on the internal road network, there would be a minimum 75mm upstand between the table/ramp and the adjacent path.

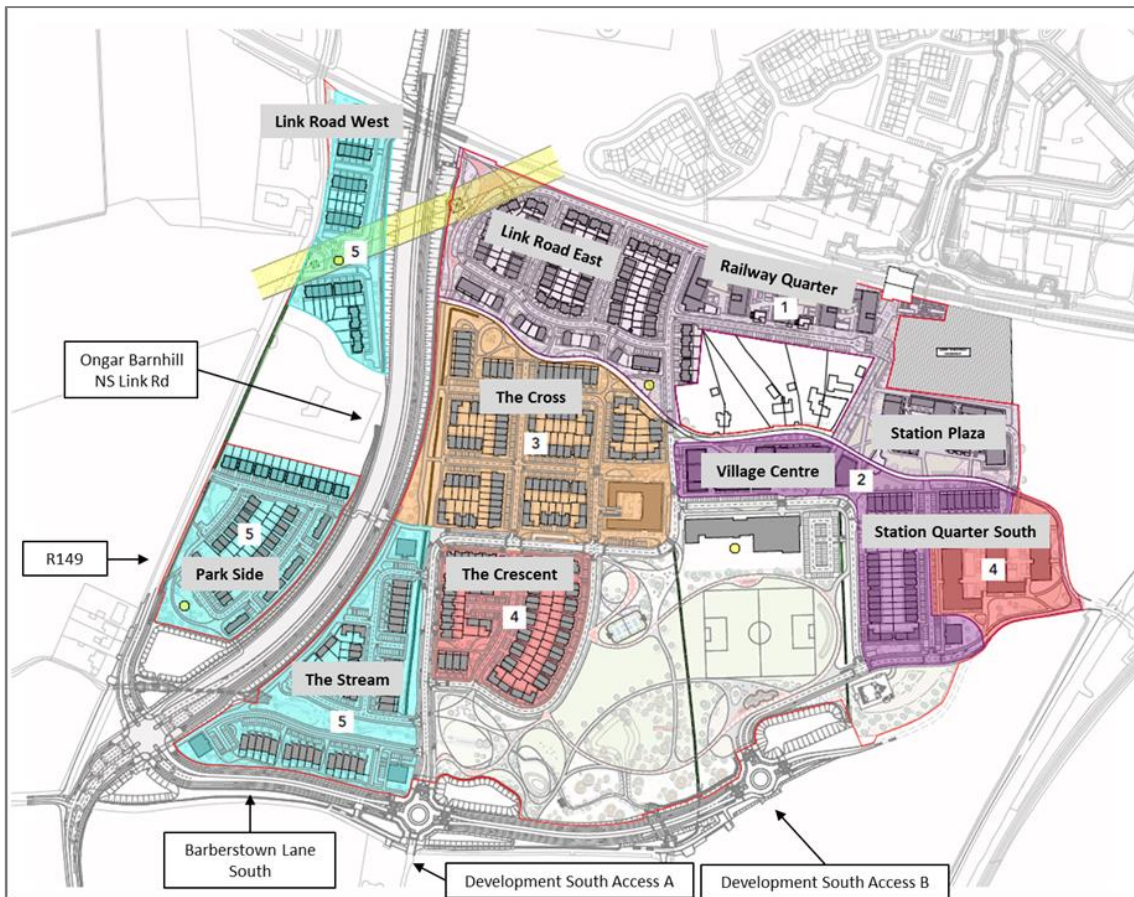
It is proposed to provide a pedestrian & cyclist Greenway along the route of Barberstown Lane North, which will also cater for vehicles over the section in front of the existing residential properties adjacent to the Railway Plaza.

## 2.5 Construction Phases

The construction of the proposed development would be undertaken in five phases, as shown on Figure 2-6 and Table 2.2.

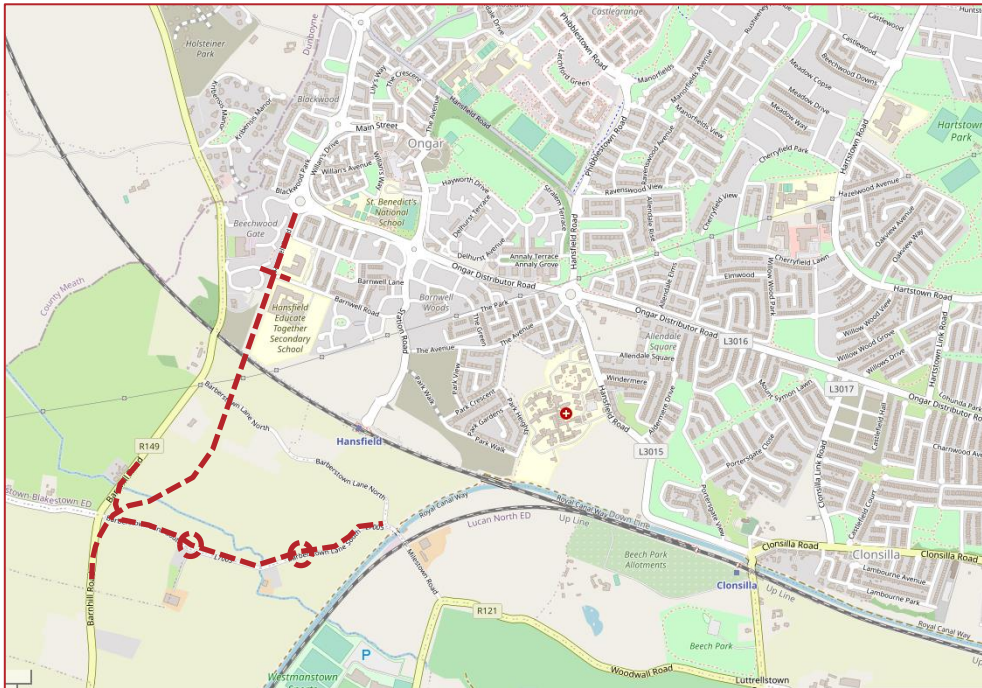
**TABLE 2.2: CONSTRUCTION PHASES**

Phase	Area	Timeline
1	Railway Quarter Link Road East Station Plaza	2025-2029
2	Village Centre	2027-2029
3	The Cross	2028-2030
4	The Crescent Station Quarter South	2029-2030
5	Link Road West Parkside The Stream	2030-2032



**FIGURE 2-6: CONSTRUCTION PHASES AREAS**

## 2.6 Ongar-Barnhill Distributor Road



**FIGURE 2-7: LOCATION PLAN (SOURCE: WWW.OPENSTREETMAP.ORG)**

The proposed Ongar-Barnhill Distributor Road will extend from the southern arm of the existing Barnwell Roundabout on the Ongar Distributor Road and continue south along the existing Barnwell Road which currently terminates at a mini-roundabout at the Hansfield Educate Together National School. This mini-roundabout would be replaced by a signalised crossroad junction, with Toucan crossings on all arms.

The Ongar-Barnhill Distributor Road would then continue south through greenfield sites to where it crosses the Clonsilla to M3 Parkway railway line and Barberstown Lane North, which would be severed by the proposed new road. It would then terminate at a new signalised crossroad junction with the existing R149 Regional Road and Barberstown Lane South.

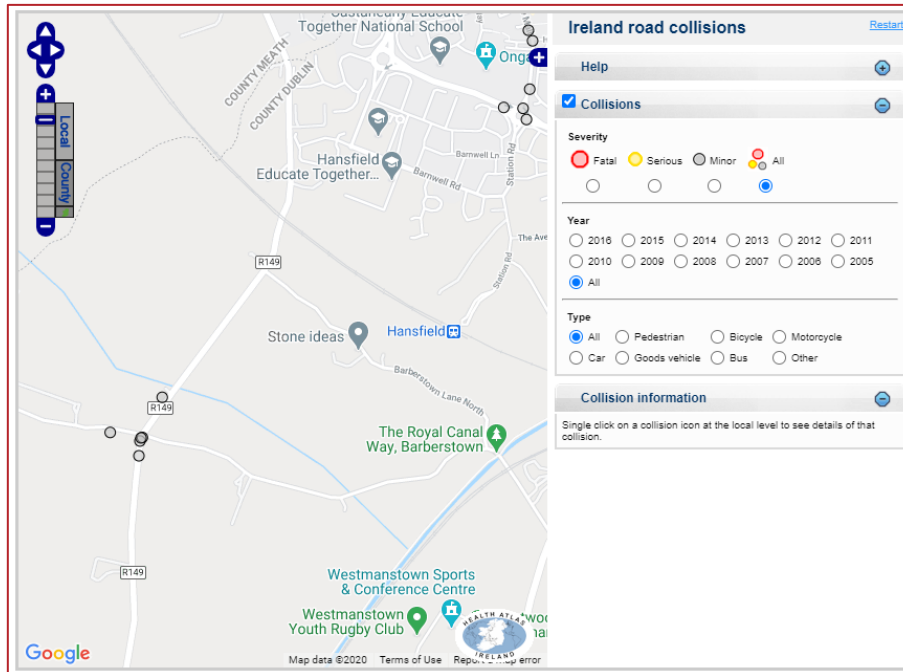
A shared pedestrian & cyclist path is proposed along the western side of the Distributor Road, extending north from the junction with the realigned Barberstown Lane South, and extending to the development site boundary at Parkside.

The Ongar-Barnhill Distributor Road proposes segregated non-motorised road user facilities (including a footway and two-way cycle track) on the eastern side of the proposed carriageway and improvements to Barberstown Lane South. These works to Barberstown Lane South include alignment improvements, the provision of pedestrian & cycle facilities on both sides and the construction of two new roundabouts to provide access to the lands which are the subject of the proposed Barnhill SHD. Zebra crossings are proposed on all arms of these proposed roundabouts.

The proposed posted speed limit on the Ongar to Barnhill Distributor Road is 50kph from Barnwell Roundabout to the proposed signalised junction at the Beechwood Heath residential development and 60kph further south of this junction.

## 2.7 Collision History

The Road Safety Authority website ([www.rsa.ie](http://www.rsa.ie)) was consulted to identify historical collisions in the vicinity of the proposed Scheme. The website includes summary information on recorded collision occurrence for the period 2005 to 2016. 6 Minor Injury collisions were recorded on the R149 in the vicinity of its junction with Barberstown Lane South.



**FIGURE 2-8: COLLISIONS RECORDED ON THE ROAD SAFETY AUTHORITY’S COLLISION DATABASE IN THE VICINITY OF THE PROPOSED DEVELOPMENT (SOURCE: WWW.RSA.IE)**

Table 2.3 below summarise the details recorded in relation to these collisions.

**TABLE 2.3: COLLISIONS RECORDED ON THE ROAD SAFETY AUTHORITY’S COLLISION DATABASE IN THE VICINITY OF THE PROPOSED DEVELOPMENT (SOURCE: WWW.RSA.IE)**

Severity	Year	Vehicle	Circumstances	Day of week	Time	Speed limit
Minor	2005	Car	Head-on conflict	Friday	07:00-10:00	80KPH
Minor	2007	Car	Other	Wednesday	10:00-16:00	80KPH
Minor	2008	Bus	Angle, right turn	Tuesday	19:00-23:00	50KPH
Minor	2008	Car	Other	Tuesday	19:00-23:00	50KPH
Minor	2008	Car	Other	Tuesday	10:00-16:00	80KPH
Minor	2014	Car	Single vehicle only	Friday	23:00-03:00	80KPH

### 3 Main Report

#### 3.1 Problem

Location: General Problem

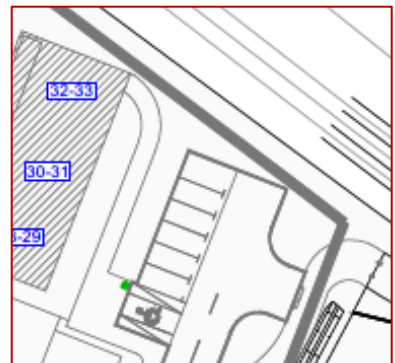
Summary: Unclear if safe vehicular access/egress from parking spaces at the end of cul-de-sac sections of internal roads can be achieved in all instances.

In a number of locations parking spaces have been indicated at the end of cul-de-sac sections of internal roads, and it is unclear from the information provided whether safe vehicular access can be achieved to/from these terminal spaces.

Should there be insufficient room for vehicles entering/exiting these parking spaces, this could result in collisions with vehicles in the adjacent parking spaces resulting in material damage.

#### Recommendation

The proposed parking spaces within the development should permit safe entry/exit, and the adjacent road layout should accommodate the swept path of the type of vehicles intended to use these parking spaces.



#### 3.2 Problem

Location: General Problem

Summary: Edge protection not indicated at the edge of the ditches along the Greenway.

There are existing drainage ditches along the Barberstown Lane North, part of which is shown as being retained for use as a Greenway within the proposed development.

It is unclear if the existing ditches along Barberstown Lane North are to be modified. Should the ditches be retained in their current form, there is a risk that they would present a height-hazard for pedestrians and cyclists on the Greenway, with a risk of personal injury should a pedestrian or cyclist fall into the ditch.

#### Recommendation

Along the Greenway a review of the existing ditches should be undertaken during the next design stage, and the existing arrangement should be amended if required to remove any risk of falls from height.



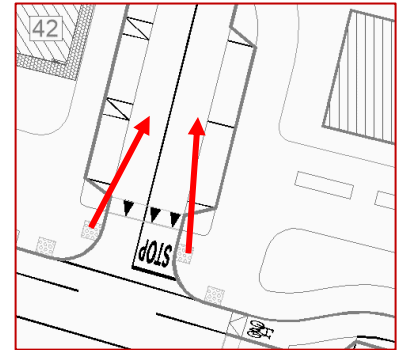
### 3.3 Problem

*Location:* The Cross, Station Quarter & Station Quarter South

*Summary:* Inter-visibility between drivers and pedestrians at crossings.

At a number of locations parallel parking is indicated in close proximity to proposed pedestrian crossing locations.

The proximity of the parallel parking to these uncontrolled crossing locations could impede inter-visibility between approaching drivers and NMUs about commence crossing resulting in unsafe crossings and possible vehicular/pedestrian collisions.



### Recommendation

Inter-visibility between pedestrians at crossing locations and approaching drivers should be unobstructed.

### 3.4 Problem

*Location:* Link Road West Area

*Summary:* Visibility at “Link Road West” junction with R149

The access junction to the Link Road West Area is located at an existing side road junction. During the Site Visit it was noted that visibility for vehicles exiting from the existing junction, in both directions along the R149 and in particular to the south, is relatively poor.

It is unclear from the information provided whether it is intended to improve visibility for vehicles exiting at this location. Should the visibility for exiting drivers not be improved, this could result in unsafe exit manoeuvres leading to possible side-on collisions.



### Recommendation

Adequate visibility should be provided for drivers exiting at this junction location.

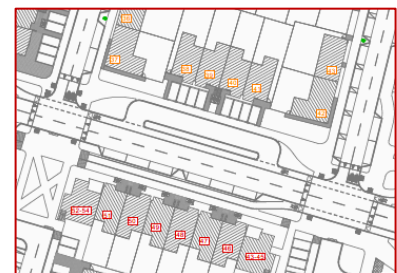
### 3.5 Problem

*Location:* The Cross

*Summary:* Approach angle to the junction may result in insufficient visibility to approaching cyclists or traffic.

It is proposed to provide a parallel access road serving Units 38 to 41 within “The Cross” area. The access road is relatively narrow, and it is unclear if this is intended to be a two-way section of carriageway, or one-way.

In addition, it may be difficult for exiting drivers to approach the junction with the Spine Road at an angle close to 90°, which may result in limited visibility towards approaching cyclists or vehicles in one, or both, directions resulting in unsafe exiting manoeuvres and possible side-swipe collisions.



### Recommendation

The proposed road layout should be such as to permit exiting vehicles on the parallel access road to approach the junction with the Spine Road at an angle close to 90°. The permitted direction of travel should be clearly indicated to drivers.

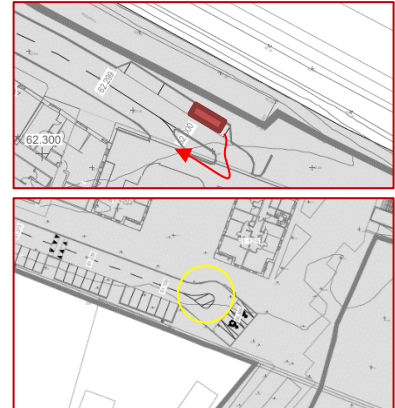
### 3.6 Problem

*Location: Railway Quarter*

*Summary: It is unclear if vehicles will be sufficiently able to turn within the development resulting in the potential for them having to reverse when exiting the development.*

Information regarding the swept path of large vehicles (refuse trucks, emergency vehicles, delivery vehicles etc.) has not been provided to the Audit Team. It is therefore unclear if these vehicles will have sufficient space, in particular vehicles in the parallel parking spaces on the northern side of the road in the northern part of the Railway Quarter and at the turnaround areas, to undertake u-turns without mounting or overhanging footpaths or colliding with roadside furniture.

If sufficient space is not available for vehicles to turn around safely this could lead to these vehicles having to reverse back through the development when exiting which could lead to an increased risk of collisions with other vehicles or vulnerable road users.



### Recommendation

The turnaround areas/locations should accommodate the swept path of all vehicles expected to use these areas and the parallel parking spaces north of the “Railway Quarter” should be capable of being accessed and exited safely.

### 3.7 Problem

*Location: Station Area South*

*Summary: Restricted turning manoeuvres within undercroft parking spaces may lead to low-speed material damage collisions.*

The “Station Area South” under-croft carpark includes a number of parking spaces which may be difficult to exit, including parking spaces 35, 36, 53 & 11. The constrained nature of these parking spaces may lead to material damage collisions.



### Recommendation

A swept-path analysis should be undertaken to confirm safe entry/exit from the proposed car parking spaces. Where necessary, the layout should be revised to ensure that safe access/egress can be achieved from all proposed parking spaces.

### 3.8 Problem

*Location: Station Area South*

*Summary: Limited visibility within proposed undercroft parking may result in unsafe exiting manoeuvres.*

Visibility for drivers reversing out of undercroft car parking space 11 may be limited by the adjacent wall, resulting in unsafe exiting manoeuvres and possible shunt-type collisions.

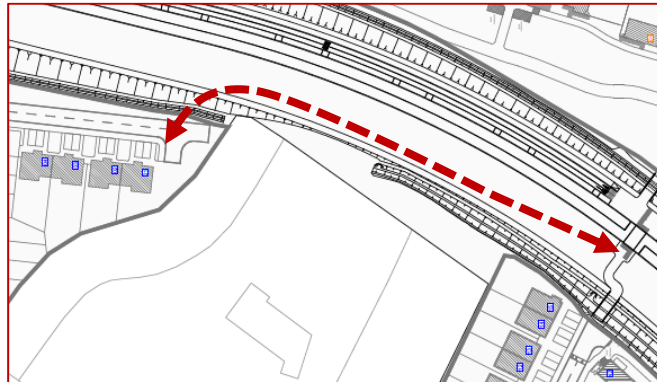


## Recommendation

Adequate inter-visibility should be provided between drivers of vehicles exiting from all of the proposed undercroft car parking spaces and approaching drivers on the aisles.

## 4 Observations

- 4.1 There is a likely NMU desire line between the “Link Road West” area and the “Village Centre” area across the Ongar-Barnhill Distributor Road away from the proposed pedestrian and cyclist underpass.

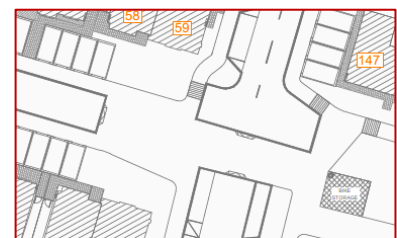


This may result in NMUs joining the Ongar-Barnhill Distributor Road close to the southernmost corner of the Link Road West Area, where the level difference between the Distributor Road and the internal road is relatively low, and travelling south to the crossing of the Distributor Road east of the “Parkside” area.

A footpath link should be provided along the western side of the Ongar-Barnhill Distributor Road catering for this potential NMU route. As this is outside of the development site, this should be brought to the attention of the relevant road Authority.

- 4.2 Bevelled Kerbs for cyclist access to/from the shared paths and the carriageways within the development have been indicated at many locations.

At this early stage in the design development it is unclear what the upstand on these kerbs is proposed to be. Should the upstand be too low there is a risk of visually-impaired pedestrians inadvertently entering the carriageway where they are at increased risk of being struck by a vehicle.



During the design development ensure an appropriate height of kerb is provided for cyclist access ensuring visually impaired are adequately warned of the carriageway hazard.

- 4.3 The Railway Plaza constitutes an extensive shared area for NMUs travelling to/from the railway station. It is unclear, at this early stage in the design development, if a Safe Zone for visually-impaired pedestrians will be incorporated into this route, or indeed any of the proposed shared routes within the development.

An absence of Safe Zones in shared areas may result in visually impaired being unable to travel independently within the shared surfaces.

- 4.4 Electric Vehicle charging points have been indicated adjacent to a number of the parking spaces proposed, predominantly at perpendicular parking spaces which are adjacent to mobility-impaired parking spaces, which have a buffer around them, or within buildouts at parallel parking locations. Public EV parking spaces should be sized in accordance with Chapter 7 of the Traffic Signs Manual.

## 5 Road Safety Audit Team Statement

We certify that we have examined the drawings referred to in this report. The examination has been carried out with 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 identified have been noted in this report together with associated safety improvement suggestions, which we would recommend should be studied for implementation.

No one on the Road Safety Audit Team has been involved with the design of the scheme.

### ROAD SAFETY AUDIT TEAM LEADER

Peter Monahan

Signed:



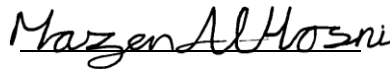
Dated:

24<sup>th</sup> June 2022

### ROAD SAFETY AUDIT TEAM MEMBER

Mazen Al Hosni

Signed:



Dated:

24<sup>th</sup> June 2022



## **Appendix A – Road Safety Audit Brief Checklist**

Have the following been included in the audit brief?: (if 'No', reasons should be given below)

	<b>Yes</b>	<b>No</b>
1. The Design Brief	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Departures from Standard	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Scheme Drawings	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. Scheme Details such as signs schedules, traffic signal staging	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Collision data for existing roads affected by scheme	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6. Traffic surveys	<input checked="" type="checkbox"/>	<input type="checkbox"/>
7. Previous Road Safety Audit Reports and Designer's Responses/Feedback Form	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8. Previous Exception Reports	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9. Start date for construction and expected opening date	<input type="checkbox"/>	<input checked="" type="checkbox"/>
10. Any elements to be excluded from audit	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Any other information?**

(if 'Yes', describe below)

<input type="checkbox"/>	<input checked="" type="checkbox"/>
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## **Appendix B – Documents Submitted to the Road Safety Audit Team**

DOCUMENT/DRAWING TITLE	DOCUMENT/DRAWING NO.	REVISION
Proposed Barnhill LAP Development Layout	16_053_00_1200	-
Proposed Barnhill LAP Road Network	16_053_00_1009	June 2022
Traffic & Transport Assessment - Barnhill LAP (Draft)	RPT-19_121-001	1st

## Appendix C – Feedback Form

## Road Safety Audit Feedback Form

Scheme: Barnhill SHD

Route No.: N/A

Audit Stage: 1 Date Audit Completed: 24<sup>th</sup> June 2022

To be Completed by Designer				To be Completed by Audit Team Leader
Paragraph No. in Safety Audit Report	Problem Accepted (Yes/No)	Recommended Measure(s) Accepted (Yes/No)	Describe Alternative Measure(s). Give reasons for not accepting recommended measure	Alternative Measures or Reasons Accepted by Auditors (Yes/No)
3.1	Yes	Yes		
3.2	Yes	Yes		
3.3	Yes	Yes		
3.4	Yes	Yes		
3.5	Yes	Yes		
3.6	Yes	Yes		
3.7	Yes	Yes		
3.8	Yes	Yes		

Signed: Conor Phillips Designer Date 27<sup>th</sup> June 2022

Signed: Peter J Monahan Audit Team Leader Date 24<sup>th</sup> June 2022

Signed: [Signature] Employer Date 27<sup>th</sup> June 2022

## Appendix D – Problem Locations

