MHL & ASSOCIATES LTD.

For: O'Flynn Construction

N72/L5331 Junction, Spa Glen, Ballyviniter,
Mallow, Co. Cork

STAGE 1 & 2 ROAD SAFETY AUDIT

February 2024

MHL & Associates Ltd.
Consulting Engineers

Document Control Sheet

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Project Title	Proposed N72/L5331 Junction Improvements, Spa Glen, Ballyviniter, Mallow
Document Title	Stage 1 & 2 Road Safety Audit
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B	Client Issue	B Murphy	J Daly	B. Loughrey	02nd-Feb-2024
C	Final Report	B Murphy	J Daly	B. Loughrey	06th-Feb-2024

M.H.L. & Associates Ltd.
Consulting Engineers
Unit 1B,
The Atrium,
Blackpool,
Cork.
Tel 021-4840214 *Fax:* 021-4840215
E-Mail: info@mhl.ie

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1 NON TECHNICAL SUMMARY

M.H.L. & Associates Ltd. Consulting Engineers have been engaged by J.B. Barry & Partners on behalf O'Flynn Construction to prepare a Combined Stage 1 & 2 Road Safety Audit to supplement a residential planning application at Spa Glen, Ballyviniter, Mallow, Co. Cork.

As part of the planning application the applicant seeks to upgrade the nearby N72/L5331 junction. This junction upgrade is to include the signalisation of the junction and various associated sightline and boundary improvement works. The sightline improvements will require the setting back of the southern roadside embankment. The works also include new public lighting, new warning signage, new safety barriers and minor road widening.

The site location and proposed site layout is shown in following Figures 1.1 and 1.2, provided by J.B. Barry & Partners, Consulting Engineers. See the Site Layout Plan drawing accompanying the application. In accordance with TII Publication GE-STY-01024, the Audit considers a scheme designed in accordance with relevant design standards "which results in new road construction or permanent change to the existing road or roadside layout".

The Audit Team consists of Brian Loughrey (Team Leader) and Brian Murphy (Team Member) of MHL Consulting Engineers. A site visit was undertaken by audit team on Thursday 11/01/2024. The weather at the time of audit site visits was cold and sunny.

Information provided to assist the Audit consists of the drawings and documents listed in Appendix B. The information provided was considered adequate in terms of detail for the purpose of carrying out a Combined Stage 1 & 2 Road Safety Audit.

No previous Road Safety Audit reports were provided in relation to the development.

No specific Road Collision data was provided to the audit team. The RSA Road Collision database was not available at the time of preparation of the audit due to GDPR concerns. The RSA is carrying out a review of its policies and procedures in relation to collision data sharing in light of GDPR and are seeking advice from experts on the most appropriate next steps in terms of mapping collisions.

Historic RSA collision data was collected as part of a previous RSA carried out by MHL in the vicinity. This recorded data (Between 2005 and 2014) is presented in Appendix D. The available Collision Data references a single Minor type collision which occurred in 2014. It involved a car and resulted in a single casualty. It appears to have occurred at the N72/L5331 junction.

The Audit has been carried out in accordance with the relevant sections of TII Publication GE-STY-01024 (formerly NRA HD 19), "Road Safety Audit". The scheme has not been examined or verified for compliance with any other standards or criteria. The team drove the local road network and walked the road along the site road boundaries and compiled a list of road safety problems and associated recommendations which are presented in this report. Appendix A contains some photographs of the site.

An Audit Team Statement is included at the end of the Report. Appendix D contains the Safety Audit Feedback Form.

Figure 1.1 **Site Location - N72/L5331 Junction, Spa Glen, Ballyviniter, Mallow (Courtesy: Openstreetmaps.org)**

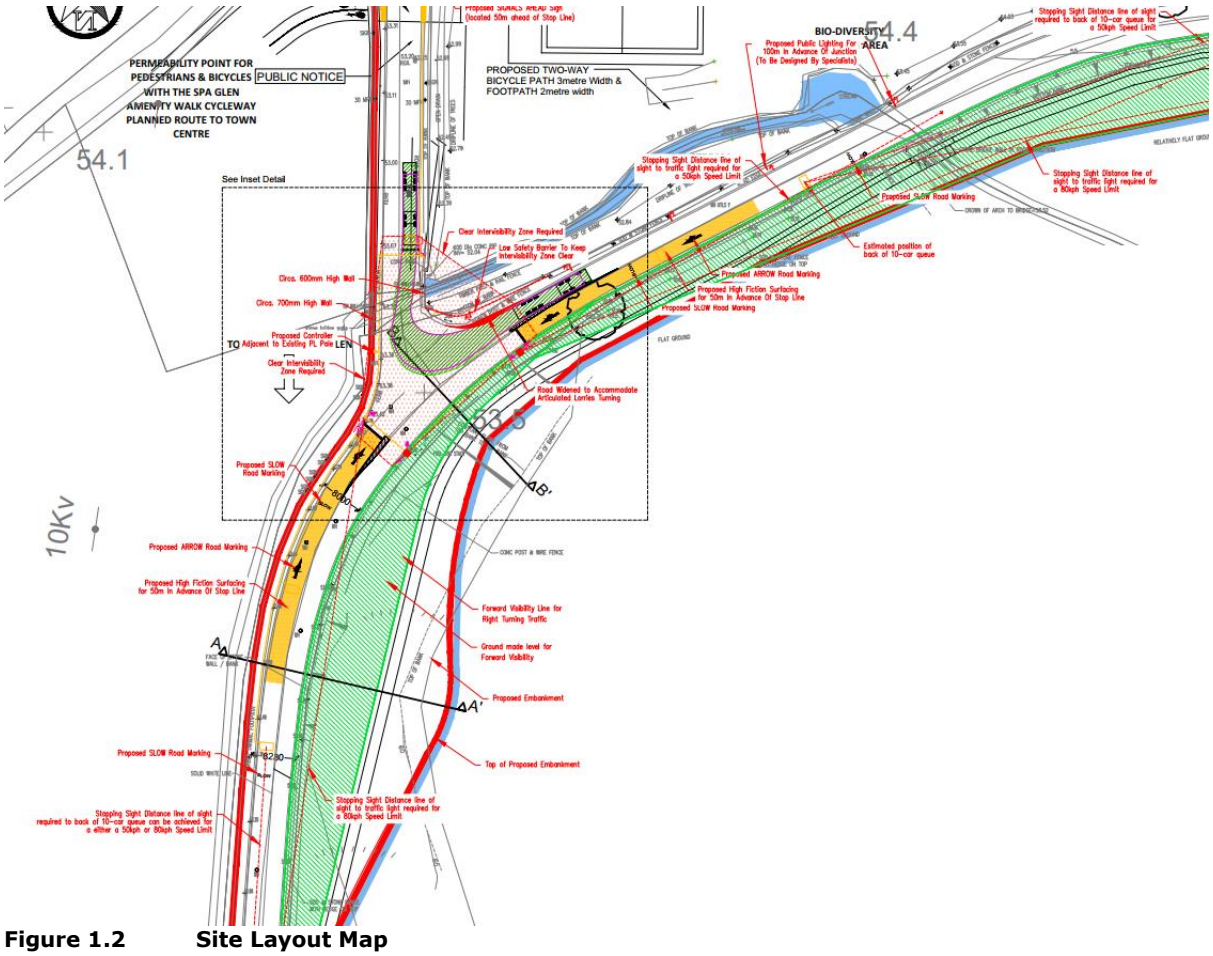


Figure 1.2 **Site Layout Map (Credit: J.B. Barry & Partners)**

2 AUDIT ISSUES

2.1 PROBLEM 1: LACK OF ROADSIDE EDGE DEFINITION

The proposed junction improvement works include setting back the southern roadside embankment to improve forward visibility to the junction. These works also require the removal of the existing roadside stone wall/bank. This clearance will result in a large flat area of roadside space, level with the carriageway. No treatment of the road edge is identified in the available drawings. Drawings indicate that the existing road edge is to remain unchanged. No kerb or other edge treatment is present along this road edge. Failure to provide appropriate edge definition may lead to drivers misinterpreting the road edge, especially at night or during periods of low visibility, potentially resulting in them driving off the carriageway and colliding with the adjoining boundary.

Recommendation 1

Provide appropriate road edge and boundary treatment where the excavation works are to be carried out, in accordance with relevant design standards, ensuring that required sightlines are not impeded.

2.2 PROBLEM 2: INTERVISIBILITY ZONES AFFECTED BY ROADSIDE BOUNDARY

Whilst the required intervisibility zone is identified at the junction it appears to encompass the existing bridge parapet wall and the proposed "low safety barrier". Failure to provide the required envelope of visibility within the intervisibility zone may lead to head on collisions as a result of drivers entering the junction and not observing a conflicting vehicle movement. See photos 10 and 11 in Appendix A.

Recommendation 2

Ensure that adequate visibility is provided within the intervisibility zone at the junction in accordance with relevant design standards.

2.3 PROBLEM 3: INTER-GREEN TIMINGS

The junction incorporates significant set backs of the various stop lines, particularly on the minor arm (L5331). Also the distance between the primary and secondary signal heads for this arm is quite long. No signal phasing or staging diagrams were provided to the audit team. Failure to provide an appropriate extended inter-green time may lead to collisions between opposing traffic movements, owing to slow moving traffic not clearing though the junction within the available inter-green period.

Recommendation 3

Provide appropriate inter-green signal staging at the location, appropriate to the junction geometry in accordance with relevant design standards.

2.4 PROBLEM 4: PUBLIC LIGHTING ASSESSMENT

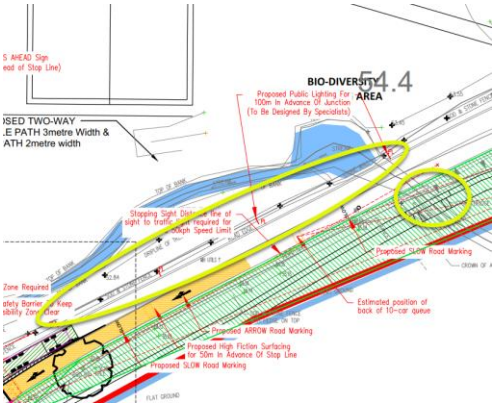
Public Lighting design details were not provided to the Audit team. Given that the proposed scheme is on the National road particular care should be taken to ensure that the development public lighting is designed appropriately. Failure to adequately illuminate the proposed entrance junction may lead to collisions involving vehicles travelling along the public road colliding with exiting cars.

Recommendation 4

Provide appropriate public lighting for the scheme, ensuring compliance with relevant design standards.

2.5 PROBLEM 5: ROADSIDE HAZARDS

Whilst a safety barrier protects errant vehicles from collisions with roadside lighting columns at the junction, a number of the public lighting columns appear to be located along the roadside without any protection. Also the removal of the road edge in the vicinity of the existing culvert to the east of the junction may present a hazard to motorists. Failure to provide a forgiving roadside, clear of hazards, may lead to collisions between errant vehicles and public lighting columns or culvert/bridge parapets.



Recommendation 5

Ensure that any the road edge and any roadside hazards are removed or designed appropriate to the location to ensure the delivery of a Forgiving Roadside at the location, in accordance with relevant design standards.

2.6 PROBLEM 6: FORWARD VISIBILITY TO TRAFFIC SIGNAL HEADS

The design drawings appear to show that appropriate forward visibility will be provided to the various traffic signal heads. During the audit site visit a high proportion of HGV's were observed at the location. Also the traffic modelling note that was provided to the audit team indicates a reasonably consistent level of queuing at the junction. The impact of this queuing, and high proportion of HGV vehicles may impact visibility onto the traffic signal heads on the N25 approach arms, potentially leading to rear end collision.

Recommendation 6

Provide supplemental high level primary signal heads on the N25 junction arms, in accordance with relevant design standards.

2.7 PROBLEM 7: UNCONTROLLED CROSSING AT 2-WAY CYCLE AND PEDESTRIAN FACILITY

The design drawings show that a new uncontrolled junction is to be provided close to the adjoining local road junction to the north of the site. Visibility onto this crossing appears to be limited by the alignment of the L5331. Failure to provide adequate visibility to/from the crossing could lead to collision between passing vehicles and crossing vulnerable road users.

Recommendation 7

Consider installing a controlled crossing at the location, in accordance with relevant design standards.

2.8 PROBLEM 8: LACK OF ROADSIDE DRAINAGE DESIGN

The design drawings do not show any roadside drainage details at the junction. The removal of the roadside embankment and levelling of this area should also be considered. Failure to provide adequate drainage along the road edge may lead to standing water and potentially lead to vehicles aquaplaning or skidding during periods of freezing temperatures.

Recommendation 8

Ensure that adequate road drainage is provided at the location in accordance with relevant design standards.

2.9 PROBLEM 9: EXTEND URBAN TRANSITION ZONE

The junction geometry and rural approach results in high ambient vehicle speeds at the junction. The posted speed limit at this location serves to exacerbate this issue and is not reflective of the residential surrounds or pedestrian route along the N72. The speed limit is not appropriate to the location. High vehicle speeds on the approach to a junction may lead to rear end collisions.

Recommendation 9

The local authority should extend the urban transition zone to encompass the junction.

2.10 PROBLEM 10: POOR ROAD SURFACE

The N72 road surface condition is very poor on approach to the junction, from the Fermoy side. See photos 6 and 7 in Appendix A. Such poor road surfaces can lead to vehicles losing control and colliding with the road edge.

Recommendation 10

Resurface the road as necessary in accordance with relevant design standards and best practice.

3 AUDIT TEAM STATEMENT

We certify that we have examined the drawings and documents listed in the Appendix to this Report and visited the site. 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 recommend should be studied for implementation. The Auditors have not been involved with the scheme design.

Mr. Brian Loughrey, B.Eng. C.Eng. M.I.E.I.

Signed: .....
01/02/2024

Mr. Brian Murphy, B.Eng. C.Eng. M.I.E.I.

Signed: .....
01/02/2024

4 APPENDIX A – PHOTOGRAPHS

Photo 1 **N72 Approach to the junction from Mallow town centre (Looking northwards)**

Photo 2 **N72 Approach to the junction from Mallow town centre (Looking northwards)**

Photo 3 **N72 Approach to the junction from Mallow town centre – L5331 on the left hand side. (Looking north-eastwards)**

Photo 4 **N72 Approach to the junction from Mallow town centre – L5331 on the left hand side. (Looking north-eastwards)**

Photo 5 **N72 beyond the junction coming from Mallow town centre (Looking north-eastwards)**

Photo 6 **N72 beyond the junction coming from Mallow town centre (Looking north-eastwards)**

Photo 7 **N72 beyond the junction coming from Mallow town centre (Looking north-eastwards)**

Photo 8 **Local junction off the L5331 north of the proposed N72 works (looking northwards)**

Photo 9 Approach to N72 junction from the L5331 (looking southwards)

Photo 10 Existing bridge/culvert Parapet wall on the L5331 (looking southwards)

Photo 11 Visibility to the Left from the L5331 onto the N72 (looking eastwards)

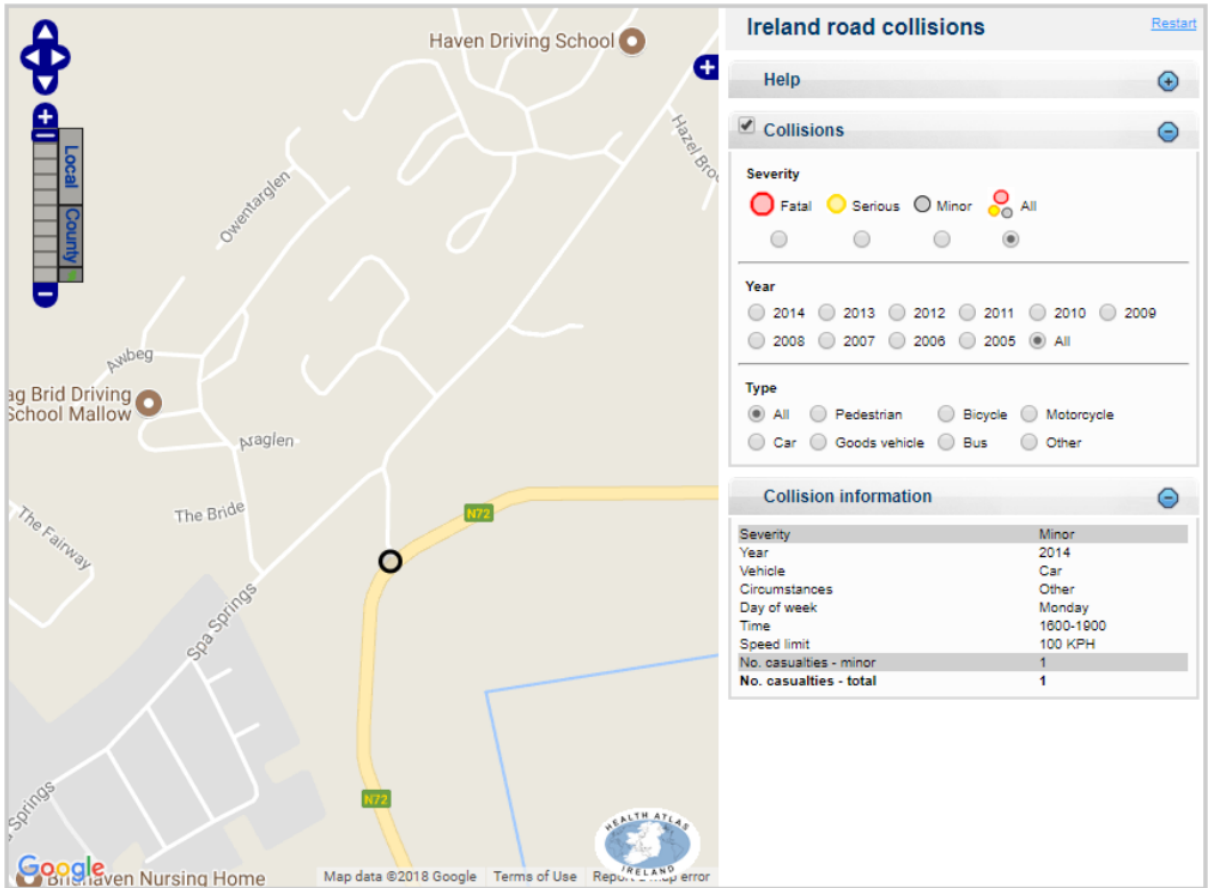
Photo 11 Visibility to the right from the L5331 onto the N72 (looking westwards)

5 APPENDIX B – DRAWINGS & DOCUMENTS SUBMITTED FOR INFORMATION

DRAWINGS BY: J.B. Barry & Partners, Consulting Engineers			
Ref.	**Rev.**	**Drawing Title**	**Scale**
Layout Drawings			
22201-JBB-XX-XX-DR-CR-00058	P03	Revised N72 Junction Signal and Visibility Improvements	1:500

Reports BY: J.B. Barry & Partners, Consulting Engineers		
Ref.	**Rev.**	**Report Title**
Report		
-	P03	Proposed N72/L5331 Junction Improvements – Technical Note

6 APPENDIX C – RSA COLLISION STATISTICS



Not currently availabe from Road Safety Authority due to GDPR considerations. The above data was collected as part of a previous RSA carried out by MHL in the vicnity.

7 APPENDIX D – RSA FEEDBACK FORM

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Road Safety Audit Feedback Form

Scheme:	N72/L5331 Junction Improvement, Spaglen, Ballyviniter, Mallow, Co Cork
Audit Stage:	1 & 2
Date Audit Completed:	21/02/2024

	To be completed by the Designer			To be Completed by Audit Team Leader
Paragraph No. in Safety Audit Report	Problem accepted (yes/no)	Recommended measure accepted (yes/no)	Describe alternative measure(s). Give reasons for not accepting recommended measure. Only complete if recommended measure is not accepted	Alternative measures or reasons accepted by auditors (yes/no)
2.1	Yes	Yes	Appropriate road edge treatment will be provided to include single yellow lining and marking posts. It is not proposed to alter the existing drainage but only to improve it in conjunction with the embankment lowering works. Cork County Council are due to upgrade are this section of the N72 shortly which will include road edge treatment and drainage improvements.	
2.2	Yes	Yes	Minor obstructions to visibility caused by historical bridge parapet wall is unavoidable. This wall is 0.6m high and it is possible to see over and around the wall. The existing hedgerow and timber post and wire fence will be removed and a low safety barrier used along the low-level stream. All existing signs impacting negativity on inter-visibility will be relocated.	
2.3	Yes	Yes	An Inter-Green time of 5 sec was used in the assessment which takes account of the set-back Stop Lines.	
2.4	Yes	Yes	A public lighting design has been prepared for the proposed N72 signalised junction by John Kelleher & Associates.	
2.5	Yes	Yes	Public lighting columns will be protected from errant vehicles. It is not intended to remove the stone culvert parapet, but additional safety barrier may be provided at this location as required.	
2.6	Yes	Yes	The layout now includes an additional secondary signal on eastern approach on the N72 for traffic coming from Mallow Town.	
2.7	Yes	Yes	Whilst it is not proposed to provide a controlled crossing under this development, it may be installed by Cork County Council once planned public amenity facilities are in place. It is proposed to replicate the existing crossing on the L2346 to the north-west by providing a raised uncontrolled crossing at a similar off-set distance from the junction. Design speeds through the L-5331-L1246 junction will be low and intervisibility at the crossing is achieved due to low-height road side boundaries on the corner.	

2.8	Yes	Yes	It is not proposed to change the roadside drainage at this location. Provision for road edge run-off will be improved during the removal of the roadside embankment. County Council have plans for road surfacing and drainage improvements for this section of the N72.	
2.9	Yes	Yes	Accepted. This issue is a matter for Cork County Council/TII/An Garda Siochana but our designs have assumed a worst-case scenario in terms of design speed.	
2.10	Yes	Yes	Whilst it is not proposed to carry out full road resurfacing at this junction, County Council have plans for road surfacing and drainage improvements for this section of the N72. Also, the proposed buff colour high-skid surfacing used for 50m in advance of the Stop Lines will only be installed on good road surfacing which will be made good if necessary.	

DESIGNER			
Signed:	Tim Delany	**Date:**	**06 Feb 2024**
AUDIT TEAM LEADER			
Signed:	Brian Loughrey	**Date:**	**06 Feb 2024**
EMPLOYER			
Signed:		**Date:**	6/Feb/2024

MHL & ASSOCIATES LTD.

OFFICES:

CORK
Unit 1B,
The Atrium,
Blackpool,
Cork.

KERRY
HQ Tralee,
Abbey Street,
Tralee,
Kerry
Tel: +353 (0) 214840214
E: info@mhl.ie

MHL & Associates Consulting Engineers
Registration Number
311279

Visit us at:
www.mhl.ie