

N72 / N73 Mallow Relief Road

Stage F Part 1 Road Safety Audit

Barry Transportation

March 2021

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1. Introduction

1.1 Report Context

This report describes the findings of a Stage F Part 1 Road Safety Audit associated with the proposed N72 / N73 Mallow Relief Road.

The Audit has been completed by Traffico Ltd. on behalf of Barry Transportation.

1.2 The Road Safety Audit Team

The members of the Road Safety Audit Team have been listed following:

Status	Name / Qualifications	TII Auditor Reference No:
Audit Team Leader (ATL)	Martin Deegan BEng(Hons) MSc CEng MIEI	MD101312
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Table 1.1 – Audit Team Details

1.3 Design Drawings Examined as Part of the Audit Process

The following drawing(s) was examined as part of the Road Safety Audit (RSA) process:

Drawing No.	Drawing Title	Revision
19415-BT-GN-ML-DR-C_4024_Shortlist Options	Shortlist Options	P03
19415-BT-01-ML-M3-C_4048	Corridor Option B RSA Stage F Plan & Profile	P01
19415-BT-01-ML-M3-C_4049	Corridor Option C RSA Stage F Plan & Profile	P01
19415-BT-01-ML-M3-C_4050	Corridor Option D RSA Stage F Plan & Profile	P01
19415-BT-01-ML-M3-C_4051	Corridor Option E RSA Stage F Plan & Profile	P01

Table 1.2 – Designers Drawing List

1.4 Road Safety Audit Compliance

Procedure and Scope

This Road Safety Audit has been carried out in accordance with the procedures and scope set out in TII publication number GE-STY-01024 - Road Safety Audit.

As part of the road safety audit process, the Audit Team have examined only those issues within the design which relate directly to road safety.

Compliance with Design Standards

The road safety audit process is not a design check, therefore verification or compliance with design standards has not formed part of the audit process.

Minimizing Risk of Collision Occurrence

All problems described in this report are considered by the Audit Team to require action in order to improve the safety of the scheme and minimise the risk of collision occurrence.

2. Road Safety Hazards Identified

2.1 Overview of Option A

The overall length of Option A is 4.4 km and represents the do-nothing or do-minimum scenario on the existing N72 through Mallow town.

2.1.1 Problem: Flooding on Park Road

Location: Park Road, Mallow Town

Flooding regularly occurs on N72 Park Road, Mallow Town, resulting in the closure of Park Road.

Hazard

Vehicles will be required to divert through Mallow Town during a flood event.

2.1.2 Problem: Mixing HGV's and Vulnerable Road Users

Location: Route Wide

The route is not a suitable candidate for promotion as an active travel corridor.

Hazard

This could lead to conflicts between vulnerable road users and general traffic.

2.1.3 Problem: Bridge Street Cross-Section

Location: Bridge Street, Mallow Town

The narrow cross-section of N72 Bridge Street in Mallow Town is difficult for HGVs to manoeuvre through.

Hazard

HGVs may encroach into the opposing lane when navigating N72 Bridge Street resulting in conflicts with oncoming vehicles.

2.1.4 Problem: Loss of Priority

Location: Bridge Street/Park Road junction, Mallow Town

The N72 loses priority at the Bridge Street/Park Road junction, Mallow Town.

Hazard

Motorists unfamiliar with the route may not anticipate the loss of priority of the N72 at this location, resulting in motorist confusion, late braking and sudden turning manoeuvres.

2.1.5 Problem: Loss of Priority

Location: Park Road/West End junction, Mallow Town

The N72 loses priority at the Park Road/West End junction, Mallow Town.

Hazard

Motorists unfamiliar with the route may not anticipate the loss of priority of the N72 at this location, resulting in motorist confusion, late braking and sudden turning manoeuvres.

2.1.6 Problem: Restricted Visibility

Location: N72/N73 Junction (Oliver's Cross)

Visibility left and right for motorists entering the N72 from the N73 at Oliver's Cross is restricted by the existing hedgerow.

Hazard

Motorists entering the N72 from the N73 may fail to observe oncoming vehicles on the N72. This problem is exacerbated by high vehicle speeds on the N72 mainline.

2.1.7 Problem: Overtaking Opportunities

Location: Route-wide

There are no safe overtaking opportunities on the existing N72 mainline.

Hazard

Inadequate overtaking opportunities may result in driver frustration and potential unsafe overtaking manoeuvres.

2.2 Overview of Option B Corridor

The overall route length is 6.09 km. The route comprises an off-line alignment located to the north of Mallow town and has 4 No. junctions.

Continuous shared pedestrian and cyclist facilities are proposed along one side of the alignment.

2.2.1 Problem: High Entry Speeds

Location: Proposed N72/N73 Junction

The proposed N72/N73 junction is located in a rural area and a junction of this type might not be expected by approaching motorists.

Hazard

Vehicles may approach this junction at inappropriate speeds.

2.2.2 Problem: Bend on Embankment

Location: Chainage 3+700 to 4+080

The provision of a bend resting on an embankment may result in an unforgiving roadside or may require a vehicle restraint system.

Hazard

Vehicle restraint systems can be hazards to errant vehicles and it is preferable to have forgiving roadsides.

2.2.3 Problem: Restricted Visibility

Location: Ballyvinitter (Chainage 2+200)

Visibility to the right for vehicles entering the proposed side road overbridge from the existing local road at Ballyvinitter may be obstructed by parapets provided on the overbridge.

Hazard

Motorists entering the side road overbridge from the existing local road at Ballyvinitter may fail to observe oncoming vehicles on the side road overbridge.

2.2.4 Problem: Restricted Visibility

Location: The Drive (Chainage 0+600)

Visibility to the right for vehicles entering the proposed side road overbridge from the existing local road at The Drive may be obstructed by parapets provided on the overbridge.

Hazard

Motorists entering the side road overbridge from the existing local road at The Drive may fail to observe oncoming vehicles on the side road overbridge.

2.3 Overview of Option C Corridor

The overall route length is 3.72 km. The route comprises an off-line alignment located to the north of Mallow town and has 2 No. junctions.

Continuous shared pedestrian and cyclist facilities are proposed along one side of the alignment.

2.3.1 Problem: High Entry Speeds

Location: Proposed N72/N73 Junction

The proposed N72/N73 junction is located in a rural area and a junction of this type might not be expected by approaching motorists.

Hazard

Vehicles may approach this junction at inappropriate speeds.

2.3.2 Problem: Restricted Visibility

Location: Ballyvinitter (Chainage 2+200)

Visibility to the right for vehicles entering the proposed side road overbridge from the existing local road at Ballyvinitter may be obstructed by parapets provided on the overbridge.

Hazard

Motorists entering the side road overbridge from the existing local road at Ballyvinitter may fail to observe oncoming vehicles on the side road overbridge.

2.3.3 Problem: Bend on Embankment

Location: Chainage 2+320 to 2+720

The provision of a bend resting on an embankment may result in an unforgiving roadside or may require a vehicle restraint system.

Hazard

Vehicle restraint systems can be hazards to errant vehicles and it is preferable to have forgiving roadsides.

2.4 Overview of Option D Corridor

The overall route length is 3.43 km. The route comprises an off-line alignment located to the north of Mallow town and has 3 No. junctions.

Continuous shared pedestrian and cyclist facilities are proposed along one side of the alignment.

2.4.1 Problem: High Entry Speeds

Location: Proposed N72/N73 Junction

The proposed N72/N73 junction is located in a rural area and a junction of this type might not be expected by approaching motorists.

Hazard

Vehicles may approach this junction at inappropriate speeds.

2.4.2 Problem: Approach Gradient

Location: Proposed N20/N72 Junction

The proposed N20/N72 junction is located in a rural area and features a climbing lane for northbound vehicles.

Hazard

Steep gradients may result in northbound HGVs stalling when entering the roundabout. Additionally, the gradient may result in southbound vehicles approaching this junction at inappropriate speeds.

2.4.3 Problem: Restricted Visibility

Location: Ballyviniter (Chainage 2+500)

Visibility to the right for vehicles entering the proposed side road overbridge from the existing local road at Ballyviniter may be obstructed by parapets provided on the overbridge.

Hazard

Motorists entering the side road overbridge from the existing local road at Ballyviniter may fail to observe oncoming vehicles on the side road overbridge.

2.4.4 Problem: Bend on Embankment

Location: Chainage 1+100 to 1+600 and Chainage 2+700 to 3+100

The provision of a bend resting on an embankment may result in an unforgiving roadside or may require a vehicle restraint system.

Hazard

Vehicle restraint systems can be hazards to errant vehicles and it is preferable to have forgiving roadsides.

2.5 Overview of Option E Corridor

The overall route length is 6.17 km. The route comprises an off-line alignment located to the north of Mallow town and has 3 No. junctions.

Continuous shared pedestrian and cyclist facilities are proposed along one side of the alignment.

2.5.1 Problem: Approach Gradient

Location: Proposed N20/N72 Junction

The proposed N20/N72 junction is located in a rural area and features a climbing lane for northbound vehicles.

Hazard

Steep gradients may result in northbound HGVs stalling when entering the roundabout. Additionally, the gradient may result in southbound vehicles approaching this junction at inappropriate speeds.

2.5.2 Problem: High Entry Speeds

Location: Proposed N72/N73 Junction

The proposed N72/N73 junction is located in a rural area and a junction of this type might not be expected by approaching motorists.

Hazard

Vehicles may approach this junction at inappropriate speeds.

2.5.3 Problem: High Entry Speeds

Location: Proposed N72 Tie-in Junction (Chainage 5+900)

The proposed N72 tie-in junction is located in a rural area and a junction of this type might not be expected by approaching motorists.

Hazard

Vehicles may approach this junction at inappropriate speeds.

2.5.4 Problem: Bend on Embankment

Location: Chainage 2+860 to 3+220 and Chainage 4+840 to 5+340

The provision of a bend resting on an embankment may result in an unforgiving roadside or may require a vehicle restraint system.

Hazard

Vehicle restraint systems can be hazards to errant vehicles and it is preferable to have forgiving roadsides.

2.5.5 Problem: Restricted Visibility

Location: Ballyvinitter (Chainage 2+200)

Visibility to the right or the left for vehicles entering the proposed side road overbridge from the existing local road at Ballyvinitter may be obstructed by parapets provided on the overbridge.

Hazard

Motorists entering the side road overbridge from the existing local road at Ballyvinitter may fail to observe oncoming vehicles on the side road overbridge.

3. Route Comparison & Ranking

3.1 Safety Observations Relating to Option A Corridor

The overall length of Option A is 4.4 km and comprises the do-nothing/do-minimum scenario on the existing N72 through Mallow town.

Flooding regularly occurs on N72 Park Road, Mallow Town, resulting in the closure of Park Road.

The narrow cross-section of N72 Bridge Street in Mallow Town is difficult for HGVs to manoeuvre.

The N72 loses priority at the Bridge Street/Park Road junction and Park Road/West End junction, Mallow Town.

Visibility left and right for motorists entering the N72 from the N73 at Oliver's Cross is restricted by the existing hedgerow.

Direct accesses are currently provided on the N72 and these are to be retained.

There are no overtaking opportunities on the existing N72 mainline.

3.2 Safety Observations Relating to Option B Corridor

The overall route length is 6.1 km. The route comprises an off-line alignment located to the north of Mallow town.

Continuous shared pedestrian and cyclist facilities are proposed along one side of the alignment and good connectivity to existing pedestrian facilities in Mallow Town should be achievable.

The scheme has 4 No. junctions. The proposed N72/N73 junction is located in a rural area and a junction of this type might not be expected by approaching motorists.

The scheme includes the reconfiguration of the existing Beecher St Roundabout to a four-arm roundabout or a traffic signal-controlled junction with the provision of another roundabout immediately to the north. It is proposed to retain Oliver's Cross in its current configuration to facilitate access to Mallow Town from the N73.

The combination of horizontal and vertical alignment results in the provision of a bend on an area of fill for a distance of approximately 400m.

Visibility for vehicles entering proposed side road overbridges from existing local roads at Ballyvinitter and the Drive may be obstructed by parapets provided on the overbridge.

The corridor for route B appears to cross through 35 No. fields. However, this a protected road and no field accesses are proposed directly from the new alignment.

From the audit brief, it is estimated that this route option will provide 39% overtaking in the eastbound direction and 37% overtaking in the westbound.

3.3 Safety Observations Relating to Option C Corridor

The overall route length is 3.7 km. The route comprises an off-line alignment located to the north of Mallow town.

Continuous shared pedestrian and cyclist facilities are proposed along one side of the alignment, however, due to the isolated location of the scheme, in comparison to Mallow Town, good connectivity to existing pedestrian facilities in Mallow Town may not be achievable.

The scheme has 2 No. junctions. The proposed N72/N73 junction is located in a rural area and a junction of this type might not be expected by approaching motorists.

The existing Beecher St Roundabout is to be retained in its current configuration with 6-arms. Under this scheme, access to Mallow Town from the N73 via Oliver's Cross will be provided via the existing N72 and will not require a turning movement at this junction.

The combination of horizontal and vertical alignment results in the provision of a bend on an area of fill for a distance of approximately 400m.

Visibility for vehicles entering the proposed side road overbridge from the existing local road at Ballyvinitter may be obstructed by parapets provided on the overbridge.

The corridor for route C appears to cross through 28 No. fields. However, this a protected road and no field accesses are proposed directly from the new alignment.

From the audit brief, it is estimated that this route option will provide 38% overtaking in the eastbound direction and 31% overtaking in the eastbound.

3.4 Safety Observations Relating to Option D Corridor

The overall route length is 3.4 km. The route comprises an off-line alignment located to the north of Mallow town.

Continuous shared pedestrian and cyclist facilities are proposed along one side of the alignment, however, due to the isolated location of the scheme, in comparison to Mallow Town, good connectivity to existing pedestrian facilities in Mallow Town may not be achievable.

The scheme has 3 No. junctions. The proposed N72/N73 junction is located in a rural area and a junction of this type might not be expected by approaching motorists.

The existing Beecher St Roundabout is to be retained in its current configuration with 6-arms. Under this scheme, access to Mallow Town from the N73 via Oliver's Cross will be provided via the existing N72 and will not require a turning movement at this junction.

The proposed N20/N72 junction is located in a rural area and features a climbing lane for northbound vehicles which may result in northbound HGVs stalling when entering the roundabout or may result in southbound vehicles approaching this junction at inappropriate speeds.

The combination of horizontal and vertical alignment results in the provision of a bend on an area of fill for a distance of approximately 900m.

Visibility for vehicles entering the proposed side road overbridge from the existing local road at Ballyvinitter may be obstructed by parapets provided on the overbridge.

The corridor for route D appears to cross through 32 No. fields. However, this a protected road and no field accesses are proposed directly from the new alignment.

From the audit brief, it is estimated that this route option will provide 52% overtaking in the eastbound direction and 49% overtaking in the eastbound.

3.5 Safety Observations Relating to Option E Corridor

The overall route length is 6.2 km. The route comprises an off-line alignment located to the north of Mallow town.

Continuous shared pedestrian and cyclist facilities are proposed along one side of the alignment, however, due to the isolated location of the scheme, in comparison to Mallow Town, good connectivity to existing pedestrian facilities in Mallow Town may not be achievable.

The scheme has 3 No. junctions. The proposed N72/N73 junction is located in a rural area and a junction of this type might not be expected by approaching motorists.

The existing Beecher St Roundabout is to be retained in its current configuration with 6-arms. It is proposed to retain Oliver’s Cross in its current configuration to facilitate access to Mallow Town from the N73.

The proposed N20/N72 junction is located in a rural area and a features a climbing lane for northbound vehicles which may result in northbound HGVs stalling when entering the roundabout or may result in southbound vehicles approaching this junction at inappropriate speeds.

The combination of horizontal and vertical alignment results in the provision of a bend on an area of fill for a distance of approximately 860m.

Visibility for vehicles entering the proposed side road overbridge from the existing local road at Ballyvinitter may be obstructed by parapets provided on the overbridge.

The corridor for route E crosses through 46 No. fields, however, is a protected road and no field accesses are currently proposed directly from the relief road.

From the audit brief, it is estimated that this route option will provide 57% overtaking in the eastbound direction and 59% overtaking in the eastbound.

3.6 Ranking of Route Corridor Options

A straightforward qualitative ranking system has been developed to compare specific route characteristics, using the three criteria illustrated in the following Table.

Table 3.1 – Qualitative Ranking System

Preferable
Neutral
Less Preferable

This system was then used to determine, compare and contrast the relative advantages and disadvantages of each route in relation to the other.

A summary of some of the comparative items reviewed as part of the ranking process have been provided in the following Table.

3.6.1 Route Comparison Table

Table 3.2 – Route Comparison Table

Assessment Criterion	Corridor A Length 4.4km	Corridor B Length 6.1km	Corridor C Length 3.7km	Corridor D Length 3.4km	Corridor E Length 6.2km
Overtaking	Less Preferable	Neutral	Neutral	Preferable	Preferable
VRU Impacts	Neutral	Preferable	Less Preferable	Less Preferable	Less Preferable
No. Junctions	Less Preferable	Preferable	Preferable	Preferable	Preferable
Accesses	Less Preferable	Preferable	Preferable	Preferable	Preferable
Alignment	Neutral	Preferable	Preferable	Less Preferable	Less Preferable
Mainline Tie-in	Less Preferable	Preferable	Neutral	Less Preferable	Less Preferable
Side-roads	Less Preferable	Less Preferable	Preferable	Preferable	Preferable

3.6.2 Ranking of Options Strictly in Terms of Road Safety

The Audit Team have reviewed the route option information provided by the Design Team and have ranked the options strictly in terms of road safety. A summary of the ranking exercise undertaken by the Audit Team has been provided in the following table.

Table 3.3 – Option Ranking Table

Option Reference	Road Safety Preference
Corridor B	1
Corridor C	2
Corridor E	3
Corridor D	4
Corridor A	5

All Proposed Routes Offer Significant Road Safety Improvements Over the Existing Route

The ranking provided is a comparative grading of each route option, undertaken by measuring the relative merit of each route against all other routes presented, exclusively in terms of road safety.

All the proposed options represent a significant improvement to the existing N72 / N73 and a would provide a significant improvement to safety along the route.

3.6.3 The Optimum Route in Terms of Road Safety is Not the Emerging Preferred Route

The road safety ranking of options undertaken as part of this study forms only one part of many complex criteria which must be considered by the Employer and the Designer in order to determine the emerging preferred route.

The optimum route in terms of road safety is not the emerging preferred route and is unlikely to align seamlessly with the emerging preferred route.

4. Audit Team Statement

4.1 Certification & Purpose

We certify that we have examined the drawing(s) listed in Chapter 1 of this Report.

Sole Purpose of the Road Safety Audit

The Road Safety Audit has been carried out with the sole purpose of identifying any features of the design which could be removed or modified to improve the road safety aspects of the scheme.

4.2 Audit Team's Independence to the Design Process

No member of the Audit Team has been otherwise involved with the design of the measures audited.

4.3 Road Safety Audit Team Sign-Off

Martin Deegan

Audit Team Leader
Road Safety Engineering Team

traffico

Signed:

Date: 8th March 2021

Alan Moriarty

Audit Team Member
Road Safety Engineering Team

 **BARRY**
& PARTNERS

Signed:

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