

# N3 Virginia Bypass

Stage F Part 1 Road Safety Audit

Barry Transportation

March 2021

# N3 Virginia Bypass

## Stage F Part 1 Road Safety Audit

**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 N3 Virginia Bypass.

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)	<b>Martin Deegan</b> BEng(Hons) MSc CEng MIEI	MD101312
Audit Team Member (ATM)	<b>Adrian O'Neill</b> BEng MSc CEng MIEI	AO1356497
Audit Team Member (ATM)	<b>Alan Moriarty</b> BEng MSc CEng MIEI MTPS	AM225589
Audit Trainee (AT)	-	-

Table 1.1 – Audit Team Details

### 1.3 Design Drawings Examined as Part of the Audit Process

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

Drawing No.	Drawing Title	Revision
19408-BT-01-ML-DR-C_4307	Stage 2 Option Corridors_A02	C01
19408-BT-01-ML-DR-C_4319	Option A – RSA Stage F	P01
19408-BT-01-ML-DR-C_4315	Option B – RSA Stage F Plan & Profile_S2	P01
19408-BT-01-ML-DR-C_4316	Option C – RSA Stage F Plan & Profile_S2	P01
19408-BT-01-ML-DR-C_4317	Option D – RSA Stage F Plan & Profile_S2	P01
19408-BT-01-ML-DR-C_4318	Option E – RSA Stage F Plan & Profile_S2	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 13.9 km and represents the do-nothing or do-minimum scenario on the existing N3 through Virginia town.

This option comprises a Type 2 Dual Carriageway with on-line (or partially online) between the Derver roundabout and a potential junction south of the village of Maghera.

The Option will then run off-line to link up with the Option C bypass at approximately Chainage 4+000 and follow Option C to bypass Virginia up to Chainage 11+200.

From Chainage 11+200 the Option then links back to the existing online N3 (or partially on-line) and continue to a potential junction to the northside of Lisgrea Cross. This option also comprises 6 No. junctions.

#### 2.1.1 Problem: High Entry Speeds

**Location:** Proposed Northern N3 Tie-in

The proposed northern tie-in of the N3 bypass and the existing N3 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.

#### 2.1.2 Problem: Intensification of Fifth Arm on Roundabout

**Location:** Proposed Southern N3 Tie-in

The existing roundabout at the southern tie-in currently features 5 arms. However, as one of these arms is a field access, the roundabout generally operates as a 4-arm roundabout. This corridor utilises the existing field access arm as the tie-in point to the existing roundabout, resulting in an intensification of this infrequently used arm and full use of all 5 arms on the roundabout.

##### Hazard

Increased conflicting manoeuvres at the existing roundabout.

#### 2.1.3 Problem: Bend on Embankment

**Location:** Route-Wide

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.

**2.1.4 Problem: Restricted Visibility**

**Location: Cornashesk (Chainage 8+100)**

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

**Hazard**

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

**2.1.5 Problem: Driver Confusion**

**Location: Chainage 0+100 to 3+000 and 11+600 to 13+800**

During hours of darkness, the access roads running parallel to the N3 mainline may result in motorist confusion on the N3 mainline.

**Hazard**

Oncoming headlights on the parallel access roads may cause motorist confusion on the N3 mainline, resulting in swerving manoeuvres or sudden braking.

**2.2 Overview of Option B Corridor**

The overall route length is 18.5 km. The route comprises a Type 2 dual carriageway off-line alignment located to the west of Virginia town and has 4 No. junctions.

This option runs from the existing N3/R147 Derver Roundabout Junction south of Virginia to a point north of Lisgrea Cross on the N3, and north of Virginia, passing to the west of Lough Ramor.

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

**2.2.1 Problem: High Entry Speeds**

**Location: Proposed Northern N3 Tie-in**

The proposed northern tie-in of the N3 bypass and the existing N3 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: Restricted Visibility**

**Location: Pottlereagh (Chainage 1+700)**

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

**Hazard**

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

**2.2.3 Problem: Restricted Visibility**

**Location:** Knockatemple (Chainage 4+800)

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

**Hazard**

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

**2.2.4 Problem: Bend on Embankment**

**Location:** Various Locations Route-Wide

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.

**2.2.5 Problem: Intensification of Fifth Arm on Roundabout**

**Location:** Proposed Southern N3 Tie-in

The existing roundabout at the southern tie-in currently features 5 arms. However, as one of these arms is a field access, the roundabout generally operates as a 4-arm roundabout. This corridor utilises the existing field access arm as the tie-in point to the existing roundabout, resulting in an intensification of this infrequently used arm and full use of all 5 arms on the roundabout.

**Hazard**

Increased conflicting manoeuvres at the existing roundabout.

**2.3 Overview of Option C Corridor**

The overall route length is 14.7 km. The route comprises a Type 2 Dual Carriageway off-line alignment located to the east of Virginia town and has 3 No. junctions.

This option runs east of Virginia and follows a similar alignment around the town that was based on a 2003 bypass that was approved through a Part 8 process.

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

**2.3.1 Problem: High Entry Speeds**

**Location:** Proposed Northern N3 Tie-in

The proposed northern tie-in of the N3 bypass and the existing N3 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: Cornashesk (Chainage 8+100)**

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

**Hazard**

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

**2.3.3 Problem: Bend on Embankment**

**Location: Various Locations Route-Wide**

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 C Corridor + Link Roads**

The overall route length is 14.7 km. The route comprises a Type 2 Dual Carriageway off-line alignment located to the east of Virginia town and has 5 No. junctions on the proposed new carriageway. This option also comprises the provision of two additional roads linking the N3 Bypass to the existing N3 and will require the provision of 3 No. junctions on the surrounding road network.

This option runs east of Virginia and follows a similar alignment around the town that was based on a 2003 bypass that was approved through a Part 8 process.

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

**2.4.1 Problem: High Entry Speeds**

**Location: Proposed Northern N3 Tie-in**

The proposed northern tie-in of the N3 bypass and the existing N3 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: Restricted Visibility**

**Location: Cornashesk (Chainage 8+100)**

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

**Hazard**

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

**2.4.3 Problem: Bend on Embankment**

**Location: Various Locations Route-Wide**

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.

**2.4.4 Problem: High Entry Speeds**

**Location: Proposed Northern Link Road N3 Tie-in**

The proposed northern tie-in of the N3 bypass and the existing N3 is located in a rural area with limited forward visibility due to the restricted vertical alignment and a junction of this type might not be expected by approaching motorists.

**Hazard**

Vehicles may approach this junction at inappropriate speeds.

**2.5 Overview of Option D Corridor**

The overall route length is 15.2 km. The route comprises a Type 2 Dual Carriageway off-line alignment located to the east of Virginia town and has 4 No. junctions.

This option runs east of Bruse Hill and approximately 1.7km east of Virginia town.

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

**2.5.1 Problem: High Entry Speeds**

**Location: Proposed Northern N3 Tie-in**

The proposed northern tie-in of the N3 bypass and the existing N3 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.

**2.5.2 Problem: Bend on Embankment**

**Location: Various Locations Route-Wide**

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.

## 2.6 Overview of Option E Corridor

The overall route length is 15.5 km. The route comprises a Type 2 Dual Carriageway off-line alignment located to the east of Virginia town and has 4 No. junctions.

This option runs further east of Bruse Hill and approximately 2.0km east of Virginia town.

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

### 2.6.1 Problem: High Entry Speeds

**Location:** Proposed Northern N3 Tie-in

The proposed northern tie-in of the N3 bypass and the existing N3 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.

### 2.6.2 Problem: Restricted Visibility

**Location:** Corfad (Chainage 8+100)

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

#### Hazard

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

### 2.6.3 Problem: Bend on Embankment

**Location:** Various Locations Route-Wide

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.

## 3. Route Comparison & Ranking

### 3.1 Safety Observations Relating to Option A Corridor

The overall length of Option A is 13.9 km and represents the do-nothing or do-minimum scenario on the existing N3 through Virginia town. This option comprises a Type 2 Dual Carriageway with on-line (or partially online) between the Derver roundabout and a potential junction south of the village of Maghera.

The Option will then run off-line to link up with the Option C bypass at approximately Chainage 4+000 and follow Option C to bypass Virginia up to Chainage 11+200. From Chainage 11+200 the Option then links back to the existing online N3 (or partially on-line) and continue to a potential junction to the northside of Lisgrea Cross. This option also comprises 6 No. junctions.

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

The proposed northern N3 tie-in junction is located in a rural area and a junction of this type might not be expected by approaching motorists. Additionally, the existing roundabout at the southern tie-in currently features 5 arms. However, as one of these arms is a field access, the roundabout generally operates as a 4-arm roundabout.

This corridor utilises the existing field access arm as the tie-in point to the existing roundabout, resulting in an intensification of this infrequently used arm and full use of all 5 arms on the roundabout.

The surrounding terrain for this option will require sections of alignment characterised by the combination of horizontal curvature which will be set on embankment structures for a distance of approximately 3,500m.

Oncoming headlights on the parallel access roads may cause motorist confusion on the N3 mainline, resulting in swerving manoeuvres or sudden braking.

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

This is a protected road, and no field accesses are proposed directly from the new alignment.

### 3.2 Safety Observations Relating to Option B Corridor

The overall route length is 18.5 km. The route comprises a Type 2 dual carriageway off-line alignment located to the west of Virginia town and has 4 No. junctions.

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 Virginia Town, good connectivity to existing pedestrian facilities in Virginia Town may not be achievable.

The proposed northern N3 tie-in junction is located in a rural area and a junction of this type might not be expected by approaching motorists. Additionally, the existing roundabout at the southern tie-in currently features 5 arms. However, as one of these arms is a field access, the roundabout generally operates as a 4-arm roundabout.

This corridor utilises the existing field access arm as the tie-in point to the existing roundabout, resulting in an intensification of this infrequently used arm and full use of all 5 arms on the roundabout.

The surrounding terrain for this option will require sections of alignment characterised by the combination of horizontal curvature which will be set on embankment structures for a distance of approximately 4,000m.

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

This a protected road, and no field accesses are proposed directly from the new alignment.

### 3.3 Safety Observations Relating to Option C Corridor

The overall route length is 14.7 km. The route comprises a Type 2 dual carriageway off-line alignment located to the east of Virginia town and has 3 No. junctions.

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

The proposed northern N3 tie-in junction is located in a rural area and a junction of this type might not be expected by approaching motorists.

The surrounding terrain for this option will require sections of alignment characterised by the combination of horizontal curvature which will be set on embankment structures for a distance of approximately 9,000m.

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

This a protected road, and no field accesses are proposed directly from the new alignment.

### 3.4 Safety Observations Relating to Option C Corridor + Link Roads

The overall route length is 14.7 km. The route comprises a Type 2 Dual Carriageway off-line alignment located to the east of Virginia town and has 5 No. junctions on the proposed new carriageway. This option also comprises the provision of two additional roads linking the N3 Bypass to the existing N3 and will require the provision of 3 No. junctions on the surrounding road network.

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

The proposed northern tie-in of the N3 bypass and the existing N3 is located in a rural area and a junction of this type might not be expected by approaching motorists.

The proposed northern N3 link road tie-in junction is located in a rural area with limited forward visibility due to the restricted vertical alignment and a junction of this type might not be expected by approaching motorists.

The surrounding terrain for this option will require sections of alignment characterised by the combination of horizontal curvature which will be set on embankment structures for a distance of approximately 9,000m.

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

This a protected road, and no field accesses are proposed directly from the new alignment.

### 3.5 Safety Observations Relating to Option D Corridor

The overall route length is 15.2 km. The route comprises a Type 2 dual carriageway off-line alignment located to the east of Virginia town and has 4 No. junctions.

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 Virginia Town, good connectivity to existing pedestrian facilities in Virginia Town may not be achievable.

The proposed northern N3 tie-in junction is located in a rural area and a junction of this type might not be expected by approaching motorists.

The surrounding terrain for this option will require sections of alignment characterised by the combination of horizontal curvature which will be set on embankment structures for a distance of approximately 7,500m.

This a protected road, and no field accesses are proposed directly from the new alignment.

### 3.6 Safety Observations Relating to Option E Corridor

The overall route length is 15.5 km. The route comprises a Type 2 dual carriageway off-line alignment located to the east of Virginia town and has 4 No. junctions.

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 Virginia Town, good connectivity to existing pedestrian facilities in Virginia Town may not be achievable.

The proposed northern N3 tie-in junction is located in a rural area and a junction of this type might not be expected by approaching motorists.

The surrounding terrain for this option will require sections of alignment characterised by the combination of horizontal curvature which will be set on embankment structures for a distance of approximately 7,000m.

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

This a protected road, and no field accesses are proposed directly from the new alignment.

### 3.7 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**

<b>Preferable</b>
<b>Neutral</b>
<b>Less Preferable</b>

This system was then used to determine, compare and contrast between 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.

### 3.7.1 Route Comparison Table

Table 3.2 – Route Comparison Table

Assessment Criterion	Corridor A Length 13.9km	Corridor B Length 18.5km	Corridor C Length 14.7km	Corridor C + Link Roads Length 14.7km	Corridor D Length 15.2km	Corridor E Length 15.5km
Overtaking	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
VRU Impacts	Preferable	Neutral	Preferable	Preferable	Neutral	Neutral
No. Junctions	Less Preferable	Neutral	Preferable	Less Preferable	Neutral	Neutral
Alignment	Less Preferable	Preferable	Less Preferable	Less Preferable	Less Preferable	Less Preferable
Mainline Tie-in	Less Preferable	Less Preferable	Preferable	Preferable	Preferable	Preferable
Side-roads	Neutral	Less Preferable	Neutral	Less Preferable	Preferable	Neutral

### 3.7.2 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 C	1
Corridor D	2
Corridor E	3
Corridor C +	4
Corridor B	5
Corridor A	6

#### 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 N3 and a would provide a significant improvement to safety along the route.

### **3.7.3 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 Implementation of RSA Recommendations

The problems identified herein have been noted in the Report together with their associated recommendations for road safety improvements.

We (the Audit Team) propose that these recommendations should be studied with a view to implementation.

#### 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

Signed:

Date: 19<sup>th</sup> March 2021

traffico

**Alan Moriarty**

Audit Team Member  
Road Safety Engineering Team

Signed:

Date: 19<sup>th</sup> March 2021

 **BARRY**  
& PARTNERS

**Adrian O'Neill**

Audit Team Member  
Road Safety Engineering Team

Signed:

Date: 19<sup>th</sup> March 2021

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