OCSC
O'CONNOR | SUTTON | CRONIN
Multidisciplinary
Consulting Engineers

N83 BRIDGE STREET DUNMORE
CONSTRAINTS STUDY & ROUTE OPTIONS REPORT

GALWAY COUNTY COUNCIL

PROJECT: G467

October 2020

N83 BRIDGE STREET DUNMORE
CONSTRAINTS STUDY & ROUTE OPTIONS REPORT

GALWAY COUNTY COUNCIL

PROJECT: G467

OCTOBER 2020

O'CONNOR | SUTTON | CRONIN

Multidisciplinary
Consulting Engineers

GALWAY COUNTY COUNCIL

N83 Bridge Street Dunmore

Constraints Study & Route Options Report

OCSC
O'CONNOR | SUTTON | CRONIN
Multidisciplinary
Consulting Engineers

NOTICE

OCSC Job No.: G467	Project Code	Originator	Zone Volume	Level	File Type	Role Type	Number	Status Suitability Code	Revision
	G467	OCSC	XX	XX	RP	C	0001	S3	P01

Rev.	Status	Authors	Checked	Authorised	Issue Date
P01	S3	PG	GL	AH	21.10.2020

Contents

APPENDICES:

Appendix A: Alignment Options Drawings

- Drawing G467-OCSC-XX-XX-SK-C-0011 S2 Option 1 Green Route
- Drawing G467-OCSC-XX-XX-SK-C-0012 S2 Option 2 Blue Route
- Drawing G467-OCSC-XX-XX-SK-C-0013 S2 Option 3 Red Route
- Drawing G467-OCSC-XX-XX-SK-C-0014 S2 Option 4 Magenta Route
- Drawing G467-OCSC-XX-XX-SK-C-0015 S2 Option 5 Cyan Route

Appendix B: Multi Criteria Analysis

Appendix C: Archaeological Report by Through Time Ltd.

Appendix D: Environmental Report by Enviroguide Consulting

1. Executive Summary

O'Connor Sutton Cronin & Associates Multidisciplinary Consulting Engineers (OCSC) have been appointed by Galway County Council to prepare a *Constraints Study & Route Options Report* for the Optioneering study of upgrading works at the N83 Bridge Street in Dunmore.

The provision of the N83 upgrade in Dunmore is in compliance with Transport Infrastructure objective number 8 of the Galway County Development Plan - to review the Dunmore Traffic Management Plan. The N83 is a strategic National link in Galway which is a locally and regionally important route as it provides connectivity between regional centres.

N83 Bridge Street in Dunmore is presently between 3.4 and 4.5 metres wide at Bridge Street, Dunmore. There is a necking effect which leads to an informal STOP/GO arrangement and occasional mounting of the footpath by vehicles.

This Constraints Study & Route Options Report considers the current alignment through Dunmore in the context of local and national requirements. It considers the alternative options available, constraints to the development of alternative alignments, brings forward alternative alignment options and, finally, recommends an Emerging Preferred Route for the completion of the section of the N83 through Dunmore. The report notes the aim of the funding source in relation to the potential regeneration of the village.

In order to commence the Constraints and Route Options process it is first necessary to define an appropriate Study Area. There is a balance to be struck in defining any Study Area between the need to assimilate as much information as possible, so as to best select all suitable Route Options, and the need to adopt a considered approach which identifies clear boundaries to what would be a reasonable area. The Local Economic and Community Plan for Galway County Council has a goal to revitalise and regenerate the towns, villages and islands of County Galway and to improve the connectivity of communities, the built environment and public spaces. Hence the extents of the study area takes cognisance of the village extents and the impact of any route change on the viability of Dunmore. It is evident that the Study Area should not significantly exceed the boundaries of the village. The identified Study Area is shown in Figure 1.

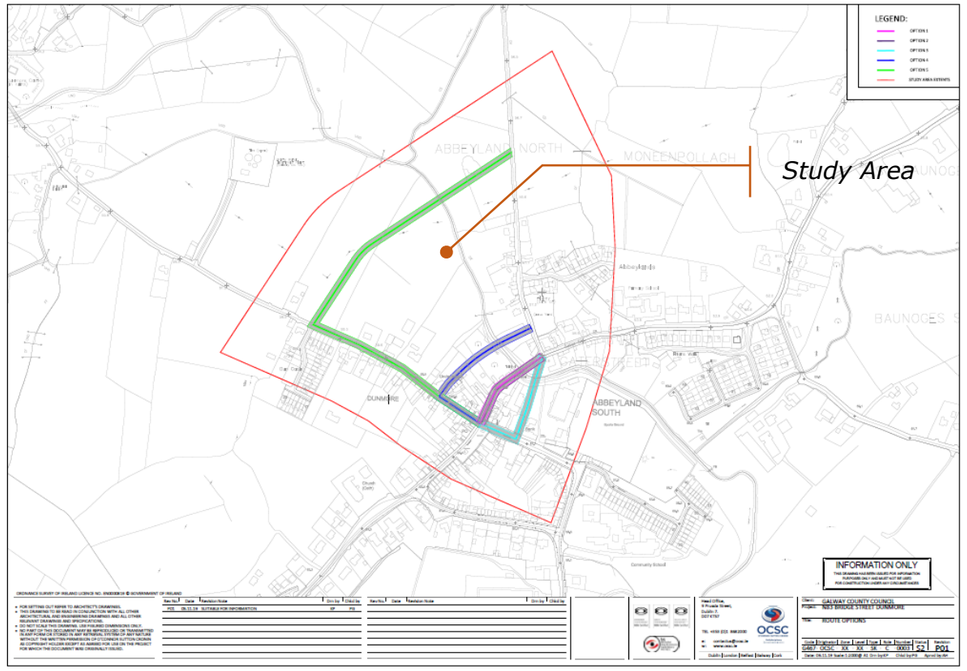

Figure 1 Study Area

Following a consideration of identifiable constraints within the defined Study Area, the study developed a Do Nothing option along with five Do Something options for the upgrading of the N83 through Dunmore. The constraints considered included archaeology, ecology, topography and ground conditions as well as extant and pending planning permissions and the existing built environment. Each of the developed alignment options is described in the report and each is assessed against a multi criteria assessment matrix in order to bring forward an Emerging Preferred Route for the village. The multi criteria assessment matrix is based on TII multi criteria methodology. Each of the options have been assessed based on the selected six criteria.

The six assessment criteria used in the Multi Criteria Analysis include:

- *1)Economy- Considering Transport Efficiency and Effectiveness ,Wider Economic Impacts, Funding Impacts, Transport Quality and Reliability*
- *2)Safety & Design Standards –Road/Street User Safety, Security, likely reduction in collisions and ability to achieve design standards*
- *3) Environment–Assessing the effects on various aspects of environment such as Flora and Fauna, Architectural and Cultural Heritage.*
- *4) Accessibility & Social Inclusion–Deprived geographical areas and vulnerable groups.*
- *5)Integration–Consideration of the routes relating to Transport Integration, Land Use Integration, Geographical Integration and other government policy integration providing regional balance.*
- *6)Physical Activity–Under this criteria, the options were ranked by consideration of the Ambience, Absenteeism (loneliness)*

The Emerging Preferred Route that came out of the Multi Criteria Analysis is the widening of Bridge Street on the east side (Option 2) as developed and the Plan of the route is outlined on sketch below.

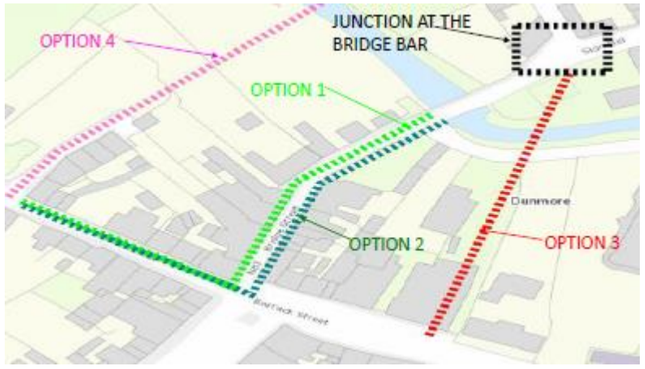

Figure 2 Extract from route options.

It is intended that the Emerging Preferred Route will now be further developed with a view to progressing through the planning stage followed by commencing construction on the receipt of planning permission. The preliminary alignment is shown on Figure 3 below:

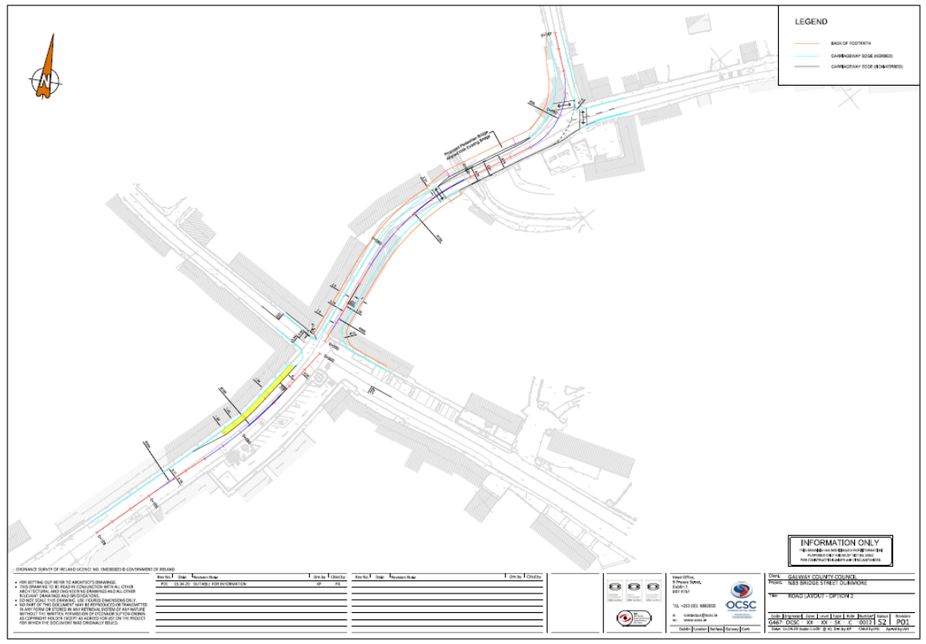

Figure 3: Emerging Preferred Route Preliminary Alignment

2. INTRODUCTION

Galway County Council initiated a Constraints Study & Route Options Report for the completion of the upgrading works of the N83 Bridge Street in Dunmore. The current general alignment of the N83 is shown in Figure 4 below and presents issues to both road users on the National Route and for the local community.

Figure No. 4: Site Location (Source: Open Street Maps)

Dunmore, is situated 15 km north east of Tuam on the Galway, Mayo and Roscommon border. It is on the N83 – A strategic National link in Galway. The original fort was a stronghold of the ancient O' Connor kings, later dispossessed by the Norman de Berminghams. They built a stone castle beside the Sinking River here after the conquest of 1235.The ruins of an old Augustinian church founded by Walter Bermingham are on the eastern side of the town. The ruins of an old Augustinian church founded by Walter Bermingham are on the eastern side of the town. Dunmore is noted for its large number of ring forts, circular earthen enclosures of early farmers.

The N83 route which is a locally and regionally important route as it provides connectivity between regional centres.

Because of its location history and attractiveness this Village has been the focus of National, Regional and local interest which has propelled it into inclusion on National, Regional and Local policy documents. See Figure 5 below. The implementation of any schemes to enhance the Village will require to demonstrate compliance of any scheme with National and Local Policy documents.

N83 Bridge Street is presently between 3.4 and 4.5 metres wide. There is a necking effect which leads to an informal STOP/GO arrangement and occasional mounting of the footpath by vehicles.

The geometry of the junction at The Square also excludes large vehicles from turning left or right onto Bridge Street. HGVs must therefore do an unnecessary loop through the town.

1) The roadway is too narrow to safely accommodate all the current legal road user movements.

2) The pedestrian facilities are not conducive to the promotion of walking or the street facing businesses.

3) There is significant under-utilisation of buildings and some dereliction along Bridge Street.

4) The junction at The Square cannot accommodate all movements leading to HGVs looping the town

5) The visibility at the T-junction of Sion Hill/Bridge St and the N83 at the Bridge Bar is compromised.

Figure No. 5: Attractive view centre of Dunmore

The constraints on this section of N83 has identified the need for the road to be improved for continuation of two way traffic including Heavy Goods Vehicles. This upgrading is fundamental to facilitate the through traffic and maintaining the vibrancy of Dunmore. This aspect has been critical to the funding allocation on this scheme and is paramount to the design solution proffered for the traffic.

3. Planning Context

The Galway County Development Plan 2015-2021 sets out an overall strategy for the proper planning and sustainable development of the functional area of Galway County Council. Galway County Council commenced the preparation of the 2022-2028 County Development Plan on the June 2020. This Plan-making process must be completed within two years by May 2022 and this document will identify the overall strategy for proper planning and sustainable developments from when it is adopted.

The overall policy for Dunmore is governed by the current Galway County Development Plan 2015-2021. Dunmore is designated as a village in the county as set out in the Development Plan. The County Development Plan outlines the varying characteristics of the villages in Galway. Dunmore is a village of less than 1500 population on the Core Strategy map of Galway County Development Plan and considered in the countryside of County Galway. Small Growth villages support the sustainable economic and social development of County Galway. Dunmore has a settlement that provides basic services facilitating development commensurate with the nature and extent of the existing settlement and availability of public services and facilities. It provides for passing traffic and the hinterlands with a range of retail and educational services and community services such as convenience goods, primary education and religious services, important community purpose and it has the basis for further future development. The County Development Plan will try to balance the need to accommodate rural generated residential development for a growing population, accommodate tourists, support communities and increased rural based commercial activities against the equally important need to protect its countryside from excessive and inappropriate development. The County Development Plan will be in accordance with the National Planning Framework (NPF) and Regional Spatial and Economic Strategy (RSES) for the North-West which sets target populations for Galway County. The Development Plan has identified under Transport Infrastructure objective number 8 to review the Dunmore Traffic Management Plan.

The Regional Planning Guidelines for the West Region 2010-2022 makes reference to "A network of thriving towns and villages" and states it will facilitate and promote the concept of "place making" and promote greater role in employment creation and developing local/rural catchment areas.

The broad approach of the Development Plan for villages is to manage growth in line with the ability of local services to cater for growth and respond to local demand. Relatively small and locally financed businesses are expected to locate in villages. However, other economic investment opportunities should be considered and supported where sustainable and in keeping with the size and services of the village. Retail is likely to be mainly in the convenience category, with a small supermarket and possible local centres serving only the passing trade and its local catchment area.

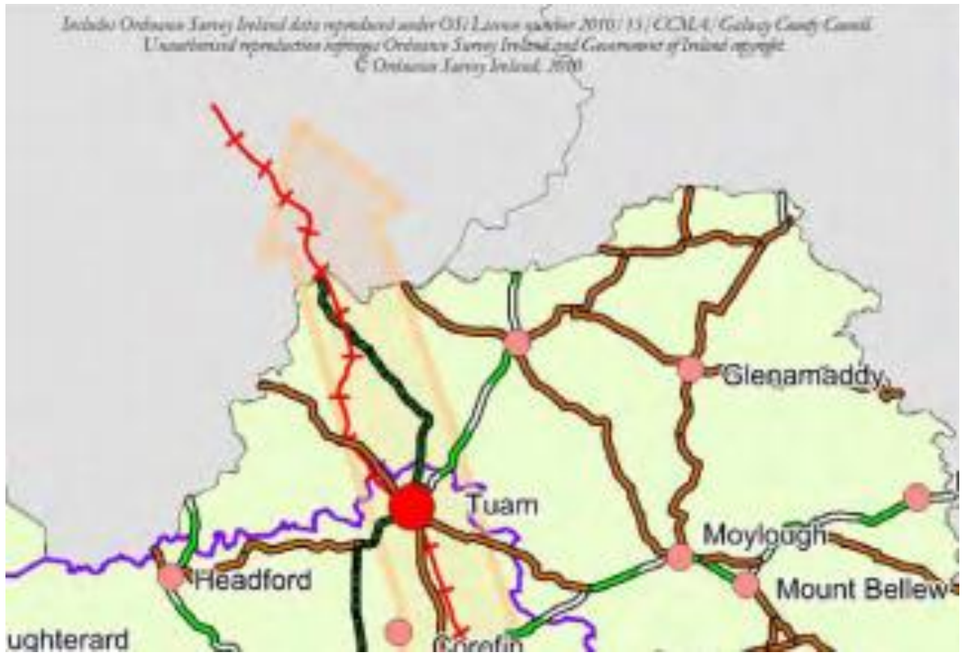

Figure No 6 Dunmore in context of Region

From implementing policies in line with the guidance contained in the '*Sustainable Residential Development Guidelines for Planning Authorities*' (Department of the Environment, Heritage and Local Government, 2009), high-level aims need to be translated into specific planning / design policy and objectives which can be applied at different scales of residential development, ranging from districts or neighbourhoods

within large urban centres, to expansion of smaller towns and villages, and finally down to the level of the individual home and its setting.

Dunmore has a critical section of Transport Infrastructure in the N83, which serves the village in addition to fulfilling its role as a critical piece of regional Infrastructure, and the impact on the village will be influenced by any works associated with maintenance, improvement or realignment of this route. Hence all aspects of National, Regional and Local Planning policies will need to be cognisant of the local sustainability aspects and the need to maintain the "life" of the village.

The planning aspects of the preparation of a Constraints Study & Route Options Report for the completion of the up grading works of the N83 Bridge Street in Dunmore can contribute to a smaller scale, village design statement for Dunmore which may provide useful supplementary guidance where no Local Area Plan exists for Dunmore which will be supported with a public consultation that will form part of the route selection.

As part of the planning process consideration is given to how effectively pedestrians, cyclists and vehicular traffic can circulate, and how the pattern of roads and streets are accessible for all. Priority will be given to connectivity for pedestrians and cyclists. New interventions such as the creation of new streets or infill redevelopment might be identified and could be accommodated into planning process where the choice of route facilitates such option.

In identifying the constraints for the proposed road improvements, the new development potential will take account and the needs of the community in Dunmore village with the availability of essential social and community infrastructure such as schools, amenities and other facilities.

The Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas (Cities, Towns & Villages) identifies smaller towns and villages, with a population ranging from 400 to 5,000 persons, are a very important part of Ireland's identity and the distinctiveness and economy of its regions hence care in preparation of any infrastructural improvements to avoid impact on the core wellbeing of the village is paramount.

Project Ireland 2040 in the West

The full participation of rural communities in the strategic development as envisaged under Project Ireland 2040 is imperative to achieving the full potential of its broad range of strategic outcomes. This applies both in terms of the traditional pillars of the rural economy, the natural resource and food sector, as well as those emerging from such developments as improved connectivity, broadband and rural economic development opportunities. As part of Project Ireland 2040, the Government has committed to providing an additional €1 billion for a new Rural Regeneration and Development Fund over the period 2019 to 2027. The Fund will provide investment to support rural renewal, strengthen and build resilience in rural communities and assist in the regeneration of towns and villages with a population of less than 10,000, and outlying areas. It will be administered by the Department of Rural and Community Development. 23 projects from the West were approved for funding from the first call of the Rural Regeneration and Development Fund including Dunmore see extract here.

Galway County Council	Dunmore Regeneration	Galway	Will develop the detailed design for the removal of derelict properties from Dunmore, create an improved aesthetic for Bridge Street and enhance the remaining buildings in terms of accessibility and visibility.	€960,909

This public capital expenditure project in the region is one of a diverse range of projects selected for investment by the State under Project Ireland 2040. Dunmore is listed as a Successful Project from the West approved under the first call of the Rural RDF scheme. In advancing the Dunmore scheme account will be taken of the full Planning Framework and all National Policy standards required and the Roads elements will require compliance with DMURS, DMRB and TII standards, the national and local cycle network standards. Development of the Dunmore area is an essential part of the development of a sustainable tourism industry for this Area.

In order for villages like Dunmore to thrive and succeed, the development must strike a balance in meeting the needs and demands of modern life but in a way that is sensitive and responsive to the past. The National planning framework identifies the development in an existing historic village like Dunmore requires design and successful integration between old and new. This can be reflected in elements such as finishes, paving and kerbing which is sympathetic to old surroundings in the case of the proposed route improvement.

The Rural Regeneration and Development Fund will, combined with wider urban and village renewal, housing and community development initiatives, create a virtuous cycle of progressive planning for, investment in and economic diversification of our rural towns and villages such as Dunmore, re-purposing them to meet the challenges of the future. While the planning considerations needs to take account of the National and local planning policies that govern future development the existing planning permissions granted by Galway County or An Bord Pleanala in the past need to be assessed and the impact on them of any new development . This aspect will be addressed and considered later in the report.

Because of its location history and attractiveness this town has been the focus of National, Regional and local interest which has propelled it into inclusion on National, Regional and Local policy documents. The implementation of any schemes to enhance the town will require to demonstrate compliance of any scheme with National and Local Policy documents.

N83 Bridge Street is presently between 3.4 and 4.5 metres wide. There is a necking effect which leads to an informal STOP/GO arrangement and occasional mounting of the footpath by vehicles. The geometry of the junction at The Square also excludes large vehicles from turning left or right onto Bridge Street. HGVs must therefore do an unnecessary loop through the town. The key problems with the existing road are:

1) The roadway is too narrow to safely accommodate all the legal movements;
2) The pedestrian facilities do not promote walking or street facing businesses;
3) There is significant under-utilisation of buildings and some dereliction along Bridge Street;
4) The junction at The Square cannot accommodate all movements leading to HGVs looping the town;
5) The T-junction of Sion Hill/Bridge St and the N83 at the Bridge Bar has inadequate visibility.

It is evident then that the alignment of this section of N83 needs is neither serving the town or through traffic properly. A positive scheme would be of massive benefit to the town-centre of Dunmore.

4. Review Of Constraints

4.2 Available Mapping & Photography

The Review of Constraints has been prepared using a mixture of Ordnance Survey (O. S.) along with the available aerial imagery and up to date digital topographical data.

The Topographical mapping used is as follows:

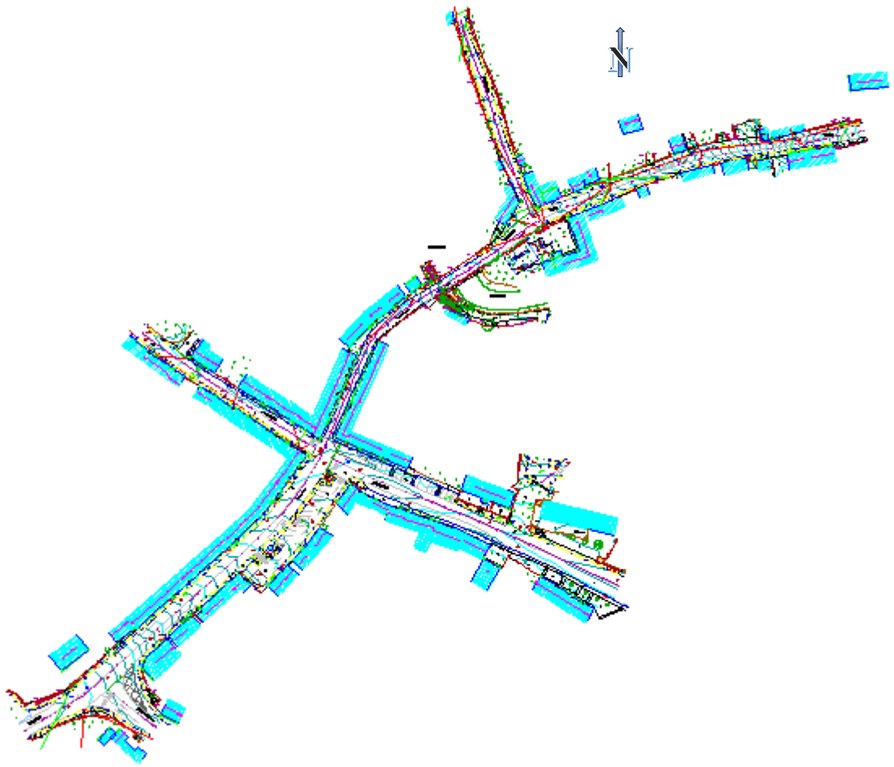

Figure 7: Topographical survey of Study Area

In addition to the background O. S. mapping OCSC availed of aerial photography, and detailed local topographical survey information.

A copy of the Ordnance Survey used in the Constraints Study are shown in Figure 8.

Figure 8: Ordnance Survey of Dunmore

4.3 Extents of Study Area

There is a balance to be struck in defining any Study Area between the need to gather as much information as possible, so as to best select all suitable Route Options, and the need to adopt a considered approach which identifies clear boundaries to what would be a reasonable area. Prior to defining a specific Study Area for this report, it is worth looking at an extended view of Dunmore. As was noted in the *Introduction* to this report, Dunmore is a town of historic importance. Because of its location history and attractiveness this town has been the focus of National, Regional and local interest which has propelled it into inclusion on National, Regional and Local policy documents. It is evident then that the alignment selection for the realignment/diversion of the N83 Bridge Street must be carried out in the context of the tight grained village context of Dunmore

as well as it economic and development reality. It is further evident that the Study Area should not unnecessarily exceed the extents of the village around the N83 Bridge Street in Dunmore.

In the above context, the Study Area shown below has been defined – Figure 9.

Figure 9: Outline of Study Area

The Study Area was sized to allow adequate scope to examine in town alternatives to Bridge Street, a western bypass and widening of Bridge Street. It is clear from a cursory view of the geography of the town that an eastern town bypass would not be a feasible route as the N83 enters the town from a south-westerly direction and leaves in a north-westerly direction.

On the southern end, the study area is extended to include part of High Street and the Square.

The area within the Study Area contain the village centre and lands with mature hedgerows, river and some wet diches. The Sinking River which is at the north of the junction at the Square runs from east to west and in the current scenario there is a bridge at the N83 on the sinking river between the junction at the square and the junction where N83 meets with R360. The topography of the site varies, with a largely flat area in the centre and north-east, surrounded by undulating lands and rolling hills. The land elevation ranges from 56–65 m AOD.

4.4 Windshield Surveys

The information for this study was garnered from the digital data sources and was augmented and verified on the ground by local knowledge and through further information collected during a number of windshield surveys and site walkovers and drive overs. These surveys and walkovers were carried out over an extended period commencing from November 2019. The visits and walkovers were done by OCSC personnel, Enviroguide (Ecology) and Through Time (Archaeology).

4.5 Land Ownership

OCSC and Galway County Council examined online Land Registry files and obtained local knowledge with regard to land ownership within the Study Area. Figure 10 shows an outline of the land ownership within our study area, which is an extract from www.Landdirect.ie.

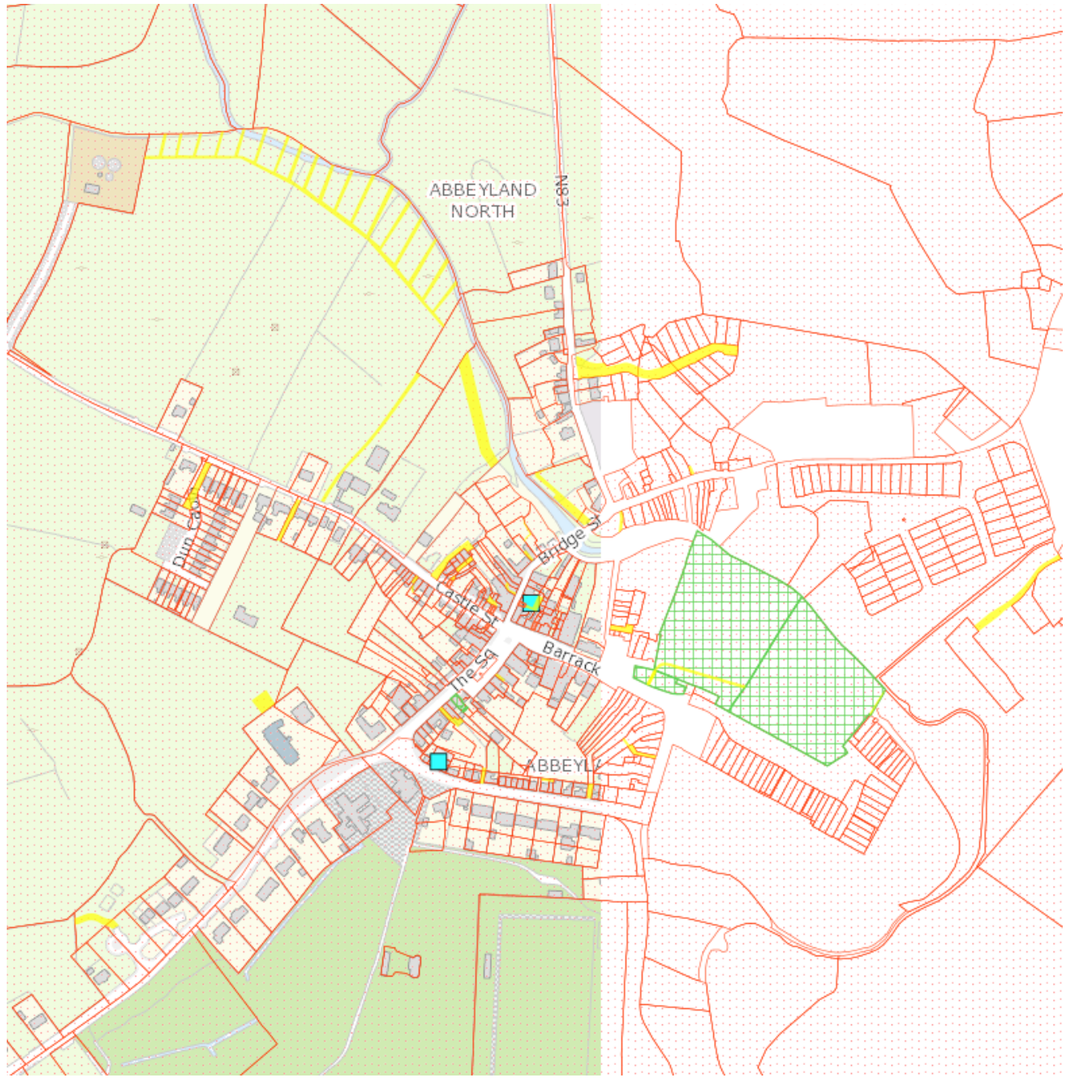

Figure 10: Land Direct Website Ownership Mapping

4.6 Granted & Pending Planning Permissions

As part of the constraint's assessment of the Study Area we undertook a review of granted and pending planning applications. This work was carried out by interrogating the National Planning Applications Database (NPAD) through national-planning-application-map-viewer. The database shows current and historic planning applications thematically according to decision type i.e.

- Granted;
- Refused;
- Invalid;
- Withdrawn.

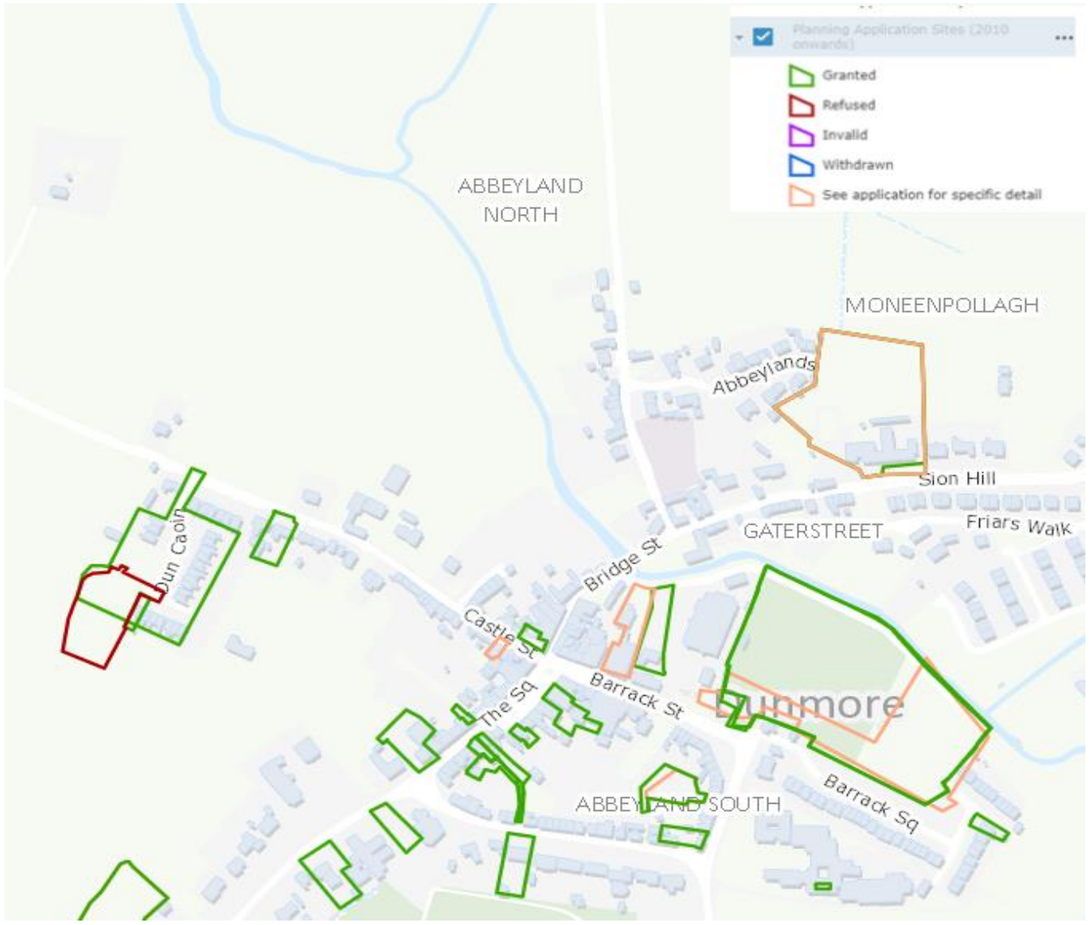

Figure 11: Granted & Pending Planning Permissions

4.7 Archaeology

An Archaeological Assessment of the Study Area has been carried out by Through Time Ltd, Professional Archaeological Services, Old church Street, Athenry, Co. Galway. This assessment is available under separate report with some of the main findings of same set out hereunder.
It would appear that all routes have the potential to impact on the archaeological, architectural and cultural heritage landscape with Option 3 having the greatest impact on the extant remains and option 5 having the least impact on extant remains.

Whatever route is designated the preferred option it is recommended that a detailed assessment of that route is undertaken, following consultation with National Monuments Service, Department of Culture, Heritage and the Gaeltacht.

Depending on the preferred route option the following may be required as part of the detailed assessment.

- Geophysical survey of the development site to identify any sub-surface archaeological features that may survive.
- Based on the findings of the geophysical survey archaeological pre-development testing works may be required in accordance with a method statement agreed with NMS and the NMI.
- A visual impact of the route with supporting photomontages may be required.
- An underwater assessment of routes that directly impact on the Sinking River will be required.

The Archaeological conclusions and recommendations are subject to the approval of the National Monuments Service (Department of Culture, Heritage and the Gaeltacht) and Galway County Council-who may issue additional or alternative requirements.

Study Area

The proposed development is located in the townlands of Dunmore, Abbeylands North and Abbeylands South in the town of Dunmore, County Galway. The route options include a re-alignment of Bridge Street in the town centre (Routes 1 & 2), a bypass Bridge Street in the west (Routes 4 & 5) and a bypass of Bridge Street in the east (Route 3).

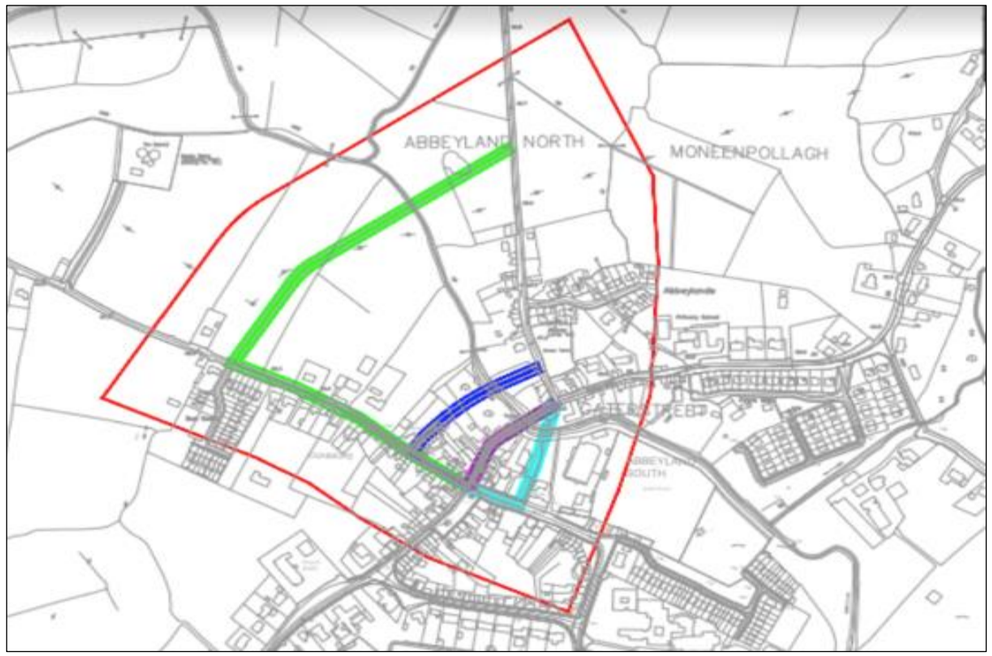

Fig. 12: Map indicating the various route options considered within the study area (red line)

Archaeological and Historical Background

The earliest reference to 'Dun-mor' is 1133, when it was 'demolished' by the army of Cormac Mac Carthaigh and Conchobhar Ua Briain (ALC; AFM). During that attack, Cathal, son of Cathal O'Conor, the royal heir of Connacht and Gilla-na-naemh Ua Floinn, chief of Sil-Maeileruain were killed. The statement that Dun-more was demolished suggests there had been a settlement there prior to 1133 while the death of such notable figures suggests that it was significant settlement by that time. Prior to the arrival of the Anglo-Normans, Dunmore was thought to be the

site of Turlough O'Conor's secular capital (Byrne 1987, 271). The exact location of that fort is unclear. It has been suggested that it preceded Dunmore Castle on the same site (Bradley and Dunne 1990, 65), however Mc Keon (2008) has suggested it may also have been the circular hill-top enclosure marked 'Rathcoll' on the O.S. maps, located 200m west of the castle.

After the Anglo- Norman conquest of Connacht c.1235, the cantred of Conmaicne Dunmore was granted in fee by Richard de Burgh to his chief tenant de Bermingham (Neary 1913-14, 97). In 1237, Richard de Burgh started building castles in Connacht (AC; AFM; ALC) and it is likely the de Bermingham castle and settlement at Dunmore was built at this time. A murage grant dated to 1279-80, names four 'burgesses and collectors of the murage of the town of Dunmore', and details monies 'received from cloth, iron, wheat, oats, horses, cows, sheep, herrings, hides, skins of goats and lambs, &c., sum of 50s.11d.' (DKPR. 6, 36). The murage grant suggests Dunmore was an Anglo-Norman walled town in the thirteenth century.

While the historical sources suggest that Dunmore was a significant settlement in the second half of the thirteenth century the record is silent for the next 200 years. Apart from the founding of the Augustinian friary by Walter de Bermingham in 1425 (Gwynn and Hadcock 1970, 299), it is not mentioned again until 1529 (ALC). In 1545, Brian O' Ruairc 'burned the town' of 'Dun-mór-Mic-Feorais' (ALC) and in 1569 it was taken by Sir Henry Sidney on his departure from Galway (AFM).

McKeon has highlighted that the problem with the early references, and most that follow, is that they generally refer only to Dunmore, however the exact location is never specified. It is therefore unclear if they refer to the existing castle ruins, the earthen enclosure of Rathcoll or to the present-day settlement of Dunmore.

The castle at Dunmore is located c. 1km north-west of the present day town. The location of both were determined by the Sinking River. The castle is situated on a small inland promontory overlooking the river to the south. The castle overlooks a ruined mill (GA017:073) and there is an associated mill race that runs along the townland boundary.

The Augustinian friary (GA017:005) is the only upstanding medieval building in the town today however analysis of landscape features, cartographic sources and historical accounts suggest there is sufficient evidence to indicate Dunmore was a medieval Anglo-Norman town. The abbey was founded by Walter de Bermingham in 1425 (Gwynn and Hadcock 1970, 299). The presence of the friary would suggest that a significant settlement, including a parish church, was in existence before that date. It is possible that the initial parish church was taken over by the Augustinians when they built the friary in the fifteenth century and the friary may stand on the site of that parish church.

The present day town flanks both the northern and southern sides of the Sinking River. The shape of the settlement is dictated by a medieval street pattern that focused on a bridge over the Sinking River and included a market place and burgage plots. On the south side of the Sinking River, the street pattern is a cross-linear street plan (Bradley 1985, 436), where 'two routes intersect at right angles, permitting linear development to take place along each route'. That plan creates four roads; High Street to south, Castle Street to west, Bridge Street to north and Barrack Street to east. After Bridge Street crosses the river it diverges into two roads, Gater Street and Chapel Street, forming a Y-shape, or forked-linear plan (Bradley 1985, 436). There are therefore two street plans that form the layout of Dunmore. A cross- linear pattern to the south of the river and a forked-linear to the north, connected by the bridge.

McKeon had demonstrated that the present-day street pattern does not reflect the initial layout of the town and that it was the ford rather than the bridge that influenced the earliest street plan. The various ordnance survey maps indicate a fording point (GA017:006) was located c. 30m east of the bridge. Such landscape features are prime indicator of an Anglo-Norman town. The ford joins the three townland boundaries of Gaterstreet, Abbeyland South and Dunmore indicating its significance. Mc Keon believes that the ford and the lane that radiates from it formed the principal route-way of the initial town. The lane that approaches the ford site from the south marks the townland boundary between Dunmore and Abbeyland South and it terminates at the abbey to the south. It then crosses the river (at the ford) into Gater Street, and leads to a church/hospital site to the north. To the east it is joined by an ancient trackway that skirts the Fair Green and passes the 'mote', and additional burgage plots appear to flank it to the west.

Barrack Street only became a through-road in the eighteenth century, when it was extended through friary land to reach the army barracks. Mc Keon believes that the prominence of the lane and importance of the ford were short-lived, and that a

bridge was constructed at an early stage. The main nucleus of the town focuses on the cross-roads and market square on the south side of the river. It is also possible that the settlement began life across the river at Gaterstreet. In a typical Anglo-Norman town layout the parish church would be located within the town and in the vicinity of the centrally placed market square, as is the case at Athenry, Galway and Loughrea. The market place, 'easily categorised by its geometric shape', is a defining characteristic of a medieval borough/town (Slater 2005, 35). The evidence would suggest that the town developed on the south side of the river and that the 'church' north of the river was not the parish church.

A short distance east of Barrack Street there was an earthen mound (GA017:004) approached by a hollow-way (GA017:004001) that is marked 'Mote' on the second ed. O.S. map of 1932. Neary (1913-14, 100), has suggested that this may be a pre-Anglo-Norman earthwork while Bradley and Dunne (1990, 70) suggest it is a barrow and Thomas (1992a, 26-7) argued that it was possibly an Anglo-Norman motte castle although Mc Keon considered it too small to have performed that role. John Bradley (1985, 429) argues that 'burgage plots are such a stable element that they constitute the basic units in any analysis of medieval town plans' and can often represent the only remaining evidence of a medieval town's location within the modern one. Land allotments likely to represent burgage plots can be clearly seen on the O.S. maps of Dunmore. The cartographic evidence is supported by aerial photographs that show burgage plots surviving throughout the town. Mc Keon believes that the plots radiating from High Street and Barrack Street are more diagnostic of Anglo-Norman burgage plots and suggest that the high-medieval town was located to the south of the river where the main nucleus of the settlement is situated today.

There are no surviving town walls at Dunmore, and it is uncertain if there ever was however the murage grant of 1279-80 implies that there was a wall. According to mcKeon it is possible that wall foundations may survive below the surface at the rear of burgage plots, particularly those west of High Street. Another pointer to their existence might be the townland boundaries while the road known as 'The Green', to the south of the town is also a likely location for the former walls.

Record of Monuments and Places

The Study Area incorporates eleven Recorded Monuments listed within the study area.Four of the route options (Routes 1-4) fall within the zone of notification/archaeological potential surrounding the historical town of Dunmore (GA017:002) while Route 5 is located west of the archaeological zone. Routes 1, 2 and 3 are located c. 30m north of the River Sinking fording point (GA017:006) while Route 3 is located c. 40m west of the Augustinian Friary and associated features (GA017:001-005). The Augustinian Friary is also a National Monument (No. 273). Route 4 will join the N83 immediately west of a graveyard (GA017:001002) and c 30m south of a church (GA017:001001).

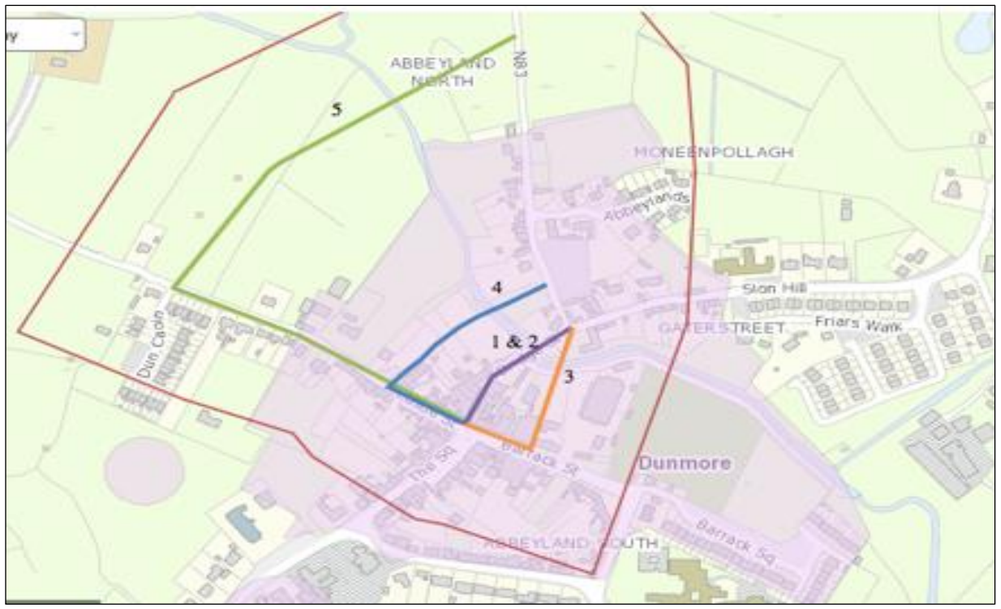

Fig. 13: Map indicating the zone of archaeological notification/potential (shaded) in relation to proposed routes.

Fig. 14: Recorded monuments in the vicinity of the proposed routes.

RMP No./ SMR No.	Class/Site Type	Townland	Distance to Route
017:161	Cross	Dunmore	65m S of R4 & 5
017:005001	Religious House	Abbeyland South	43m E of R3
017:005002	Wall Monument	Abbeyland South	43m E of R3
017:005003	Grave Slab	Abbeyland South	43m E of R3
017:005004	Cross Slab	Abbeyland South	68m E of R3
017:005005	Grave Slab	Abbeyland South	68m E of R3

RMP No./ SMR No.	Class/Site Type	Townland	Distance to Route
017:006	Ford	Abbeyland South, Dunmore, Gaterstreet	15-20m E of R3. 30m S of R1, 2.
017:001001	Church	Abbeyland North	40m N of R4
017:001002	Graveyard	Abbeyland North	10m E of R4
017:003	Church	Abbeyland North	85m N of R4
017:002	Historic Town	Dunmore Abbeyland North Abbeyland South Gaterstreet	Within Area of Notification for R1-4

Recorded Monuments in the environs of the Study Area

Previous Archaeological Investigations

A record of previous archaeological work is vital when examining the archaeological content of any area. This information is available in a bulletin that provides a summary of every archaeological excavation that has taken place in Ireland. This information is also available online (www.excavations.ie) from 1970–to 2019. The following is a record of licensed archaeological works undertaken in the vicinity of Dunmore.

99E252 Niall Gregory

Archaeological pre-development testing was undertaken in June 1999 before the construction of a supermarket and associated facilities to the north of Barrack Street. The site was located within the zone of medieval archaeology. It lay between an Augustinian abbey and a fording point across the adjacent river. Six 1m-wide test-trenches were dug on the site. These revealed 1-1.5m of landfill, over 1m of river marl. The base of the trenches consisted of river gravels.

In the south of the site a 1.5m-wide east-west-orientated ditch was recorded. It was located 9m to the north of the existing abbey structure at a depth of 0.4m. The composition of the ditch's fill showed natural sedimentation above a shallow, charcoal-rich basal layer. No artefacts were recovered. The proximity of the ditch to the abbey would suggest some association between them.

06E0416 Declan Moore & Billy Quinn

A programme of monitoring for the Dunmore sewerage scheme was completed in 2007. Two excavations were carried out during the course of the scheme in 2006 under the directorship of Billy Quinn (Excavations 2006, No. 792, 06E0605; Excavations 2006, No. 793, E2037). Nothing further of archaeological significance was noted during the course of the monitoring.

C120, E2037 Billy Quinn

Excavations were carried out in the townland of Abbeyland South, Dunmore, Co. Galway, between June and October 2006 and in January 2007. The proposed works involved the excavation of a linear trench running east–west along the northern carriageway of Barrack Street to accommodate the installation of a storm drain, as part of the Dunmore sewerage scheme. The trench directly impacts on an unrecorded cemetery associated with the nearby Augustinian friary. The friary in Abbeyland South is part of the historic town (GA017–002) of Dunmore, and is a national monument. The excavation ran c. 70m along the length of Barrack Street near the northern kerb line and was 1.5m deep. Monitoring during the initial groundworks confirmed the presence of articulated bones to the west of Barrack Street near the entrance to the Fair Green, adjacent to the Eurospar Centre and in the vicinity of the Bank of Ireland. Excavation work was carried out along the length of the road, working generally from east to west. A 2.5m-wide trench was initially opened in the vicinity of the manhole opposite Dunmore Garda Station. The trench was mechanically dug to below the level of the road fill and manually excavated from this point. The human remains ran parallel to and beyond the grounds of the friary with a general east–west orientation. The majority of the remains were phased at two levels, earlier burials being cut by later ones. In total, 287 individual skeletons were recovered.

It is likely that the remains would have been interred wrapped in a shroud, evidenced by a small number of corroded shroud pins found in association with the burials. The only finds of note were two coins, both dating to the Jacobite wars. These were a James II halfpenny of 1686 and a large 1689 shilling.

It appears this was a community graveyard dating from the foundation of the friary in the early 15th century and possibly in use up until the late 18th century, when a Colonel Gore cut a carriageway through the old graveyard, thus forming present-day Barrack Street.

06E0605 Billy Quinn

In June 2006 excavation was carried out of a fulacht fiadh in the townland of Dunmore as part of ongoing works for the Dunmore sewerage scheme. The fulacht fiadh was found near a bend on the Sinking River in a marshy field of rushes liable to floods. It was first identified as an amorphous spread of fire-cracked stones in a charcoal-enriched silt, measuring c. 10.8m north-north-west/south-south-east and 9.5m.

The depth of the mound material averaged 0.3m near the centre-point, tapering to 0.07m at its southern extremity. The trough was identified by a conspicuously dark rectangular feature located in the north-west quadrant of the mound. The trough was orientated north–south at a 30° angle from the west-facing baulk. It was filled with both redeposited mound material and peat. A half-section through the fill exposed a section face of shattered stone, ash and charcoal contained within a wood-lined rectangular cut that measured 1.25m east–west by 2.1m.

C188; E2931 Fiona Rooney

Testing and subsequent monitoring were undertaken in March 2007 at the site of proposed recreational area, including dressing room, toilets, etc., at Abbeylands, Dunmore, Co. Galway. The development site was located east of Dunmore Abbey

and within the zone of potential surrounding Dunmore town. Two trenches excavated as part of the pre-development testing and archaeological monitoring of ground disturbance revealed no features of archaeological significance.

98E0073 Fiona Rooney

This project involved monitoring the excavation of foundation and service trenches at Dunmore School, Abbeyland South, Dunmore, Co. Galway. Nothing of archaeological significance was revealed.

04E1129 Martin Fitzpatrick

Four trenches were mechanically excavated in the course of pre-development testing at Castle Street, Dunmore, Co. Galway. The stratigraphy uncovered in Trenches A-C was similar and consisted of sod and topsoil (0.3m in depth), which overlay a grey/brown sandy subsoil 0.5-0.6m in depth, which in turn overlay a yellow/grey natural gravel with frequent small stones. In Trench D the removal of sod and topsoil (0.2m deep) revealed a fill of dumped building material 0.4m in depth, which overlay the natural layer. Occasional fragments of modern pottery were recovered from this trench. The dumped material may be the remains of Glencoe House, which was once located at this site. However, no traces of wall foundations or standing remains were encountered in the course of testing.

Cartographic Review

Consultation of cartographic sources from the 16th century and ordnance survey maps from the 19th century to the present day facilitated a further assessment of the Archaeological and Architectural Heritage of the study area and individual routes.

Browne's 16th century map and William Petty's 17th century map both indicate the extent of the barony of Dunmore and the location of town within the barony.

Fig. 15: Extract from Browne's 1591 map indicating the barony of Dunmore.

Fig. 16: William Petty's 1683 map of Galway indicating the barony of Dunmore with Dunmore highlighted.

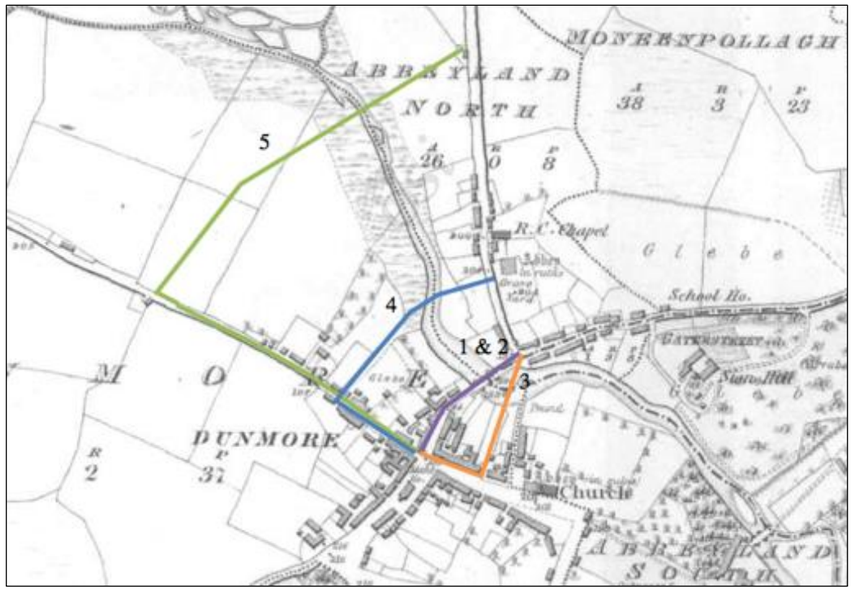

Fig. 17: Extract from 1st edition map 1838.

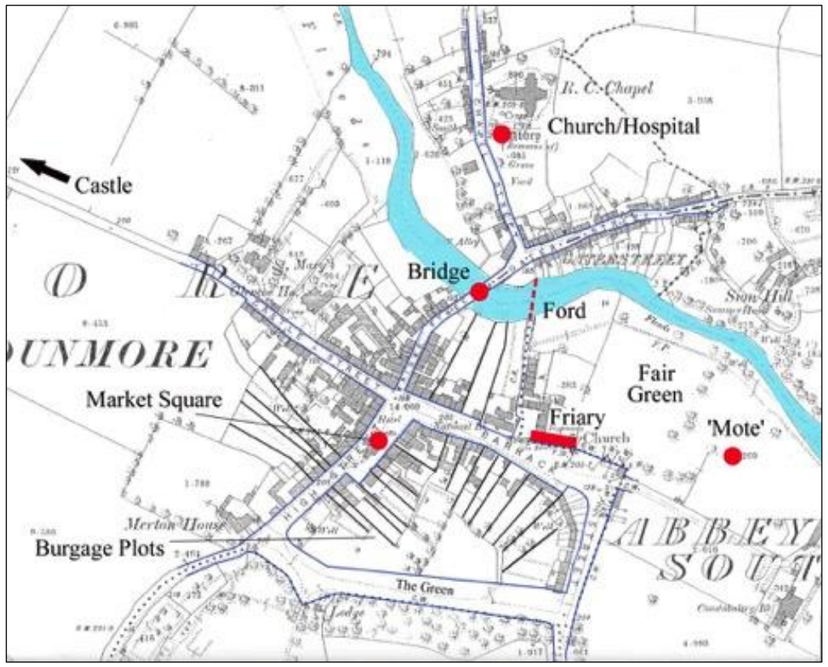

Fig. 18: Extract from 25 inch OS Map 1892 with archaeological features indicated (after Mckeon)

The first edition ordnance survey map (1838) indicates the town centre with buildings facing onto Bridge Street, Barrack Street, Castle Street and Gater Street as well as either side of the square. On both the first edition map of 1838 (Fig. 9) and the 25inch map of 1892 (Fig. 10) burgage plots run at the rear of Barrack Street and Market Square. Route 3 would directly impact on one of these plots.

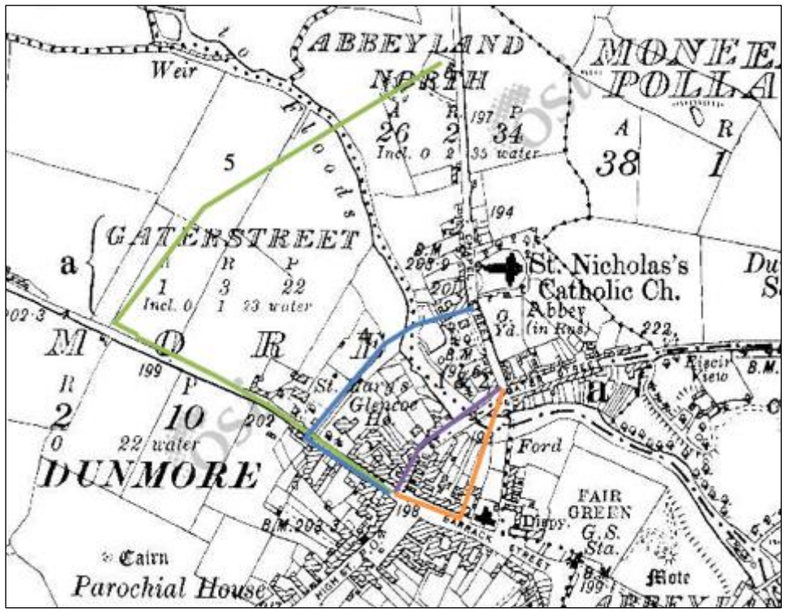

Fig. 19: Extract from 3rd edition OS Map (1914).

The third edition ordnance survey map (1914) indicates some further development in the town however the general plan and streetscape remains the same. This map indicates routes 1 and 2 in the town centre, route 3 running through a rear garden to the north of Barrack Street, Route 4 occupying a narrow roadway leading off Castle Street while Route 5 in agricultural land to the west of the town.

Townland Names

Townlands are the smallest land divisions in the Irish landscape and many may preserve early Gaelic territorial boundaries that pre-date the Anglo-Norman conquest. The layout of Irish townlands was recorded and standardised by the work of the Ordnance Survey in the 19th century. The Irish translation of townland names often refer to natural

topographical features, but name elements may also give an indication of the presence of past human activities within the townland. The following table provides information on the townland names within the Study Area. The majority of the names within the study area refer to topographical features associated with the Anglo Norman town layout.

Name	Derivation	Possible Meaning	Barony	Civil Parish
Dunmore	Dún Mór	Big Fort	Dunmore	Dunmore
Abbeylands North	Fhearann na Mainistreach Thuaidh	Northern land of the Monastery	Dunmore	Dunmore
Abbeylands South	Fhearann na Mainistreach Thuaidh	Southern land of the Monastery	Dunmore	Dunmore
Gaterstreet	Shráid an Gheata	Gater Street	Dunmore	Dunmore

Townland names in the area of the proposed development.

Aerial Photography Review

The Ordnance survey of Ireland aerial photographs (www.osi.ie) were consulted to identify any archaeological features in the landscape which may not have been previously recorded. There was no evidence of additional archaeological, architectural or cultural heritage features recorded on the aerial photographs within the study area.

Aerial view of study area & routes with recorded monuments marked.

Protected Structures and National Inventory of Architectural Heritage (NIAH)

The County Development plan (2017-2023) was consulted for the schedule of buildings (Record of Protected Structures) and items of cultural, historical or archaeological interest that may be affected by the proposed development. There are three Protected Structures within the study area. Two of the Protected Structures (Nos. 19 & 20) are also recorded archaeological monuments –Graveyard GA017:001002 and the Augustinian Friary GA017:005. The third (No. 21) is a detached 19th century house facing onto Castle Street. None of these structures will be directly impacted by any of the proposed route options.

Fig. 20: Map of Study area indicating the Protected Structures.

National Monuments in State care

The Department of Culture, Heritage and Local Government maintains a database on a county basis of National Monuments in State Care. The term National Monument is defined in Section 2 of the National Monuments Act (1930) as a monument or the remains of a monument.

"The preservation of which is a matter of national importance by reason of the historical, architectural, traditional, artistic or archaeological interest attaching thereto".

The list contains one monument within the study area- Augustinian Friary. The National Monument (Reg. 273) is located on the north side of Barrack Street.

National Inventory of Architectural Heritage

The NIAH maintains a non-statutory register of buildings and structures recorded on a county basis. There are eight buildings/structures recorded within the study area. None of these structures are directly impacted by any of the proposed routes.

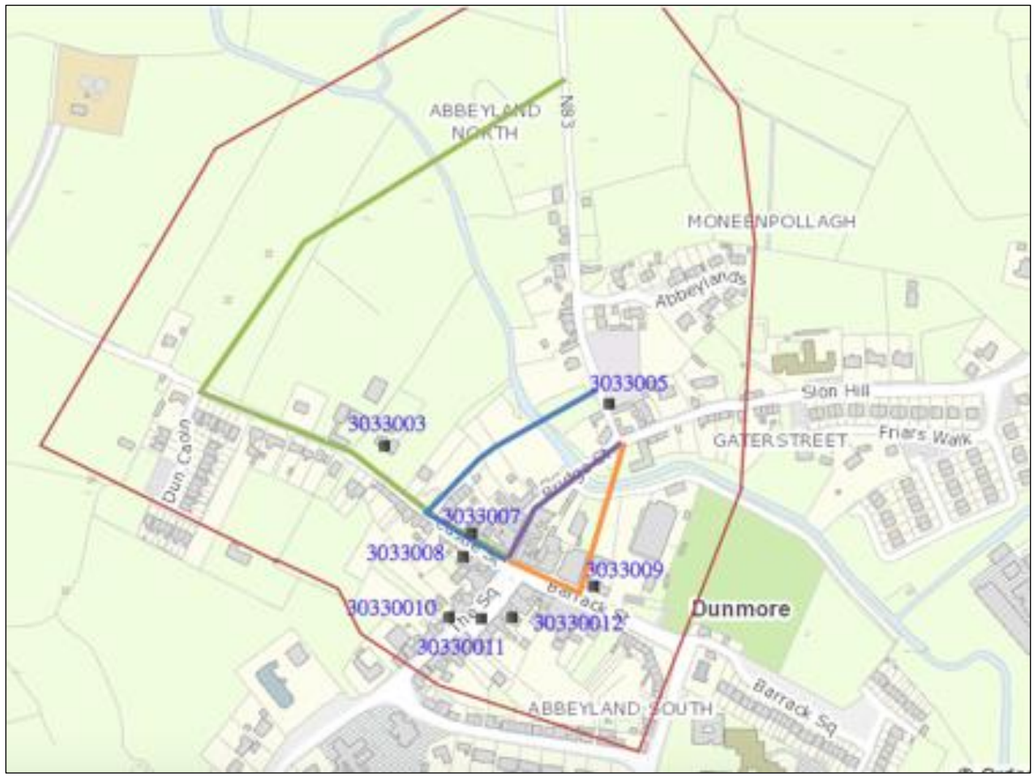

Fig. 21: Map of Study area indicating the structures recorded in NIAH.

The NIAH also maintains a non-statutory register of historic gardens and designed landscapes also recorded on a county basis. There are no gardens or designed landscapes on their records from the area of the proposed development.

4.8 Environmental Assessment

An Environmental Assessment of the Study Area (Figure 1) has been carried out by Enviroguide Consulting, Unit 3D, Core C, Block 71, The Plaza, Park West Dublin 12. This assessment is available under separate report with the main findings of same set out hereunder.

Introduction

The following is a high-level review of the five options for the proposed upgrade to the N83 at Bridge St Dunmore Co. Galway. Options 1 to 5 where stated relate to these options as detailed on Drawing Number G467-OCSC-XX-XX-SK-C-0003 (see Figure 1.)

In general, these options are reviewed for any potential environmental impact and presented in a matrix in conformance with the Project Appraisal Guidelines for National Roads Unit 7.0 – Multi Criteria Analysis, TII Publications 2016.

In addition, these options are also examined to attempt to identify if, at this early stage, it can be determined if a full Natura Impact Statement will be required for any or all of the proposed options.

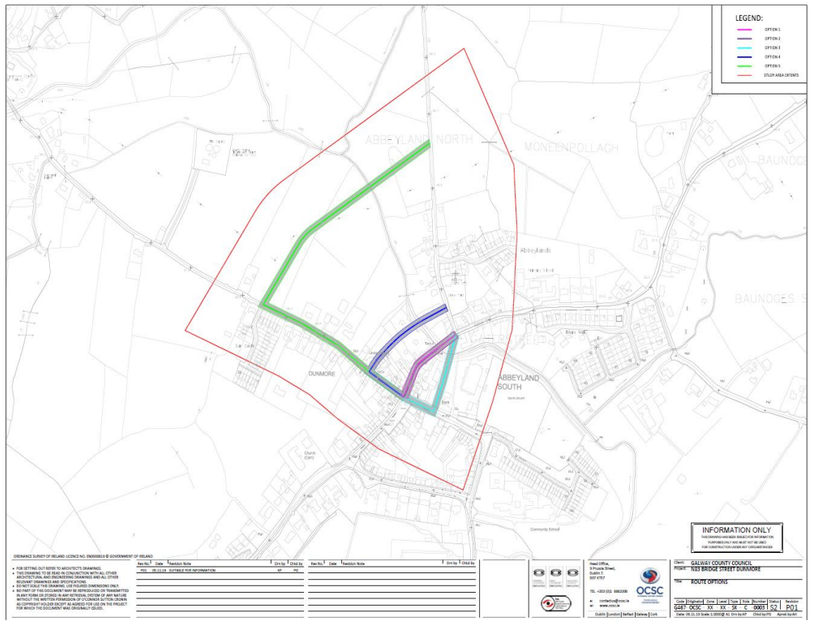

Figure 22 Environmental Study Area

It should be noted that any assessment contained within this report is at a high level and is based solely on a desk study and a site walkover visit that was carried out on 4th February 2020

4.9 Topography

As part of the constraints assessment a detailed topographic survey was undertaken of the central portion of the Study Area. A copy of the survey data is shown in Figure 7 above.

The Study Area is relatively flat and falls towards the centre or river location area and in the direction of flow of the Sinking River. In the extreme north east corner, the highest level is 65.20 m AOD and levels fall as one moves south west to 56.54 at the bridge. The levels rise again as you travel south west on N83 to a level of 63.40. There is little fall in direction parallel to river that is on Barracks Street where only 0.5 m is evident from highest point to lowest point. This is the overall low point of the surveyed area is at bridge on river.

4.10 Soils & Geology

OCSC reviewed the Geological Survey of Ireland (GSI) database in respect of the underlying geology in the vicinity of the Study Area – Figure 23 following. The soils while for the most part are Urban, Dunmore for the most part has Coarse loamy over calcareous gravels with peat to the north See Figure 24 Below.

Bedrock

The Study Area is underlain by the Ballymore Limestone Formation with Oak port Limestone to the North. The lithological description of the Ballymore Limestone is a basal unit of medium bedded crinoidal calcarenites, followed by a middle unit 40m thick of thin bedded dark nodular limestones with thick interbeds of calcareous shale. A small carbonate mudbank occurs within the middle unit. The topmost division, 52m.

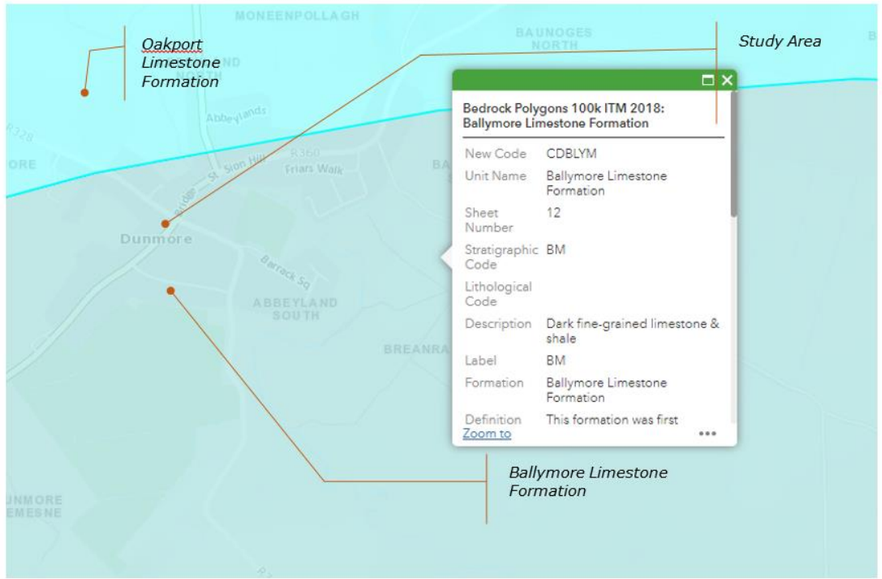

Figure 23: Bedrock Geology (Source: GSI)

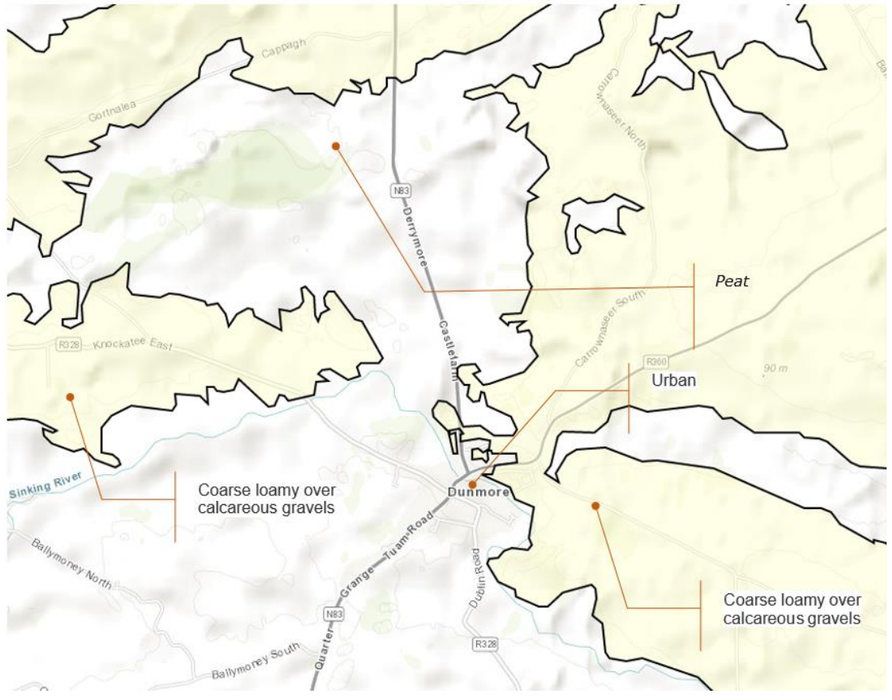

Figure 24: Soils (Source: GSI)

Groundwater Vulnerability

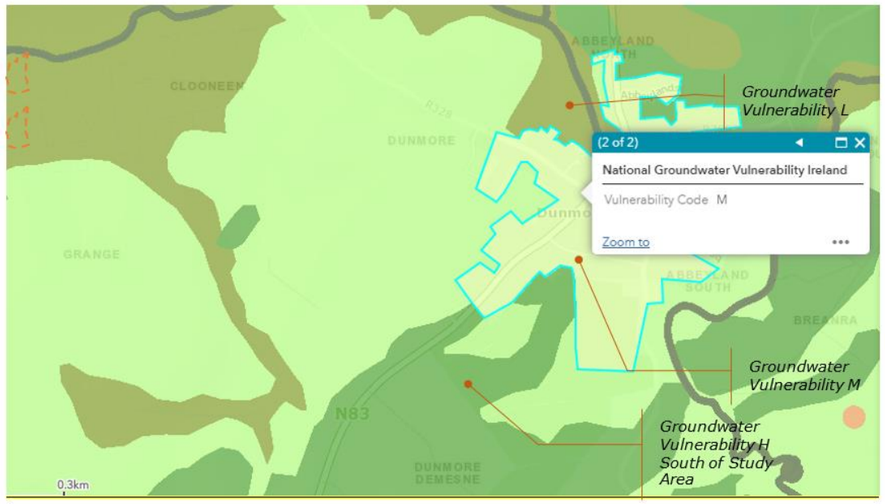

Figure 25: Groundwater Vulnerability M (Source: GSI)

Dunmore is a Regionally Important Aquifer - Karstified (conduit). The Study Area is for the most part classified as an 'M' or medium groundwater vulnerability area with an 'L' or low groundwater vulnerability area to north or east. – Figure 25. There are areas north and south of Dunmore on N83 classified as High Vulnerability but these areas are outside the area for upgrading.

4.11 Site Investigation

No detailed Site Investigation has been undertaken in the Study Area as yet. Given the options outlined on the Study Area a detailed investigation would be economically prohibitive and not be prudent on the basis of its prematurity in relation to the preferred option analysis.

There are proposals however to procure such an investigation in the near future on a more defined area subject to route selection and the results of same will feed into the preliminary design process for the Emerging Preferred Route.

Boreholes

No boreholes were evident adjacent to Dunmore

5. Road Design Standards

Introduction & DMURS Road Classification

The Design Standards to be adopted for the Dunmore upgrading will be the Design Manual for Urban Roads and Streets (DMURS) and the DMRB where applicable and in compliance with the TII requirements for the National route. The adoption of DMURS reflects the urban nature of the scheme which is largely within the village centre of Dunmore albeit that the nature of the National Road usage may demand adoption of standards appropriate to the National road.

Road Design Speed

The proposed Roads in Dunmore will have a Design Speed of 50kph. This Design Speed is consistent with the urban nature of the road and in compliance with Table 4.1 of DMURS as shown in Figure 27.

PEDESTRIAN PRIORITY VEHICLE PRIORITY

FUNCTION	CENTRE	N'HOOD	SUBURBAN	BUSINESS/ INDUSTRIAL	RURAL FRINGE
ARTERIAL	30-40 KM/H	40-50 KM/H	40-50 KM/H	50-60 KM/H	60-80 KM/H
LINK	30 KM/H	30-50 KM/H	30-50 KM/H	50-60 KM/H	60-80 KM/H
LOCAL	10-30 KM/H	10-30 KM/H	10-30 KM/H	30-50 KM/H	60 KM/H
	CONTEXT				

Table 4.1: Design speed selection matrix indicating the links between place, movement and speed that need to be taken into account in order to achieve effective and balanced design solutions.

Figure 26: Design Speed

Road Cross Sections

The carriageway cross-section will be 6.5 m (DMURS 4.4.1). The carriageway width is illustrated and selected from Figure 4.55 of DMURS – Figure 27 over for Low to Moderate speed.

The width of the footpaths is determined by reference to DMURS Section 4.3.1 where a minimum width of 1.80m is required. The road is defined as urban in character and as such a larger footpath width is justified therefore a 2.0m wide footpath will be provided to cater for the more pedestrian volumes associated with future residential developments.

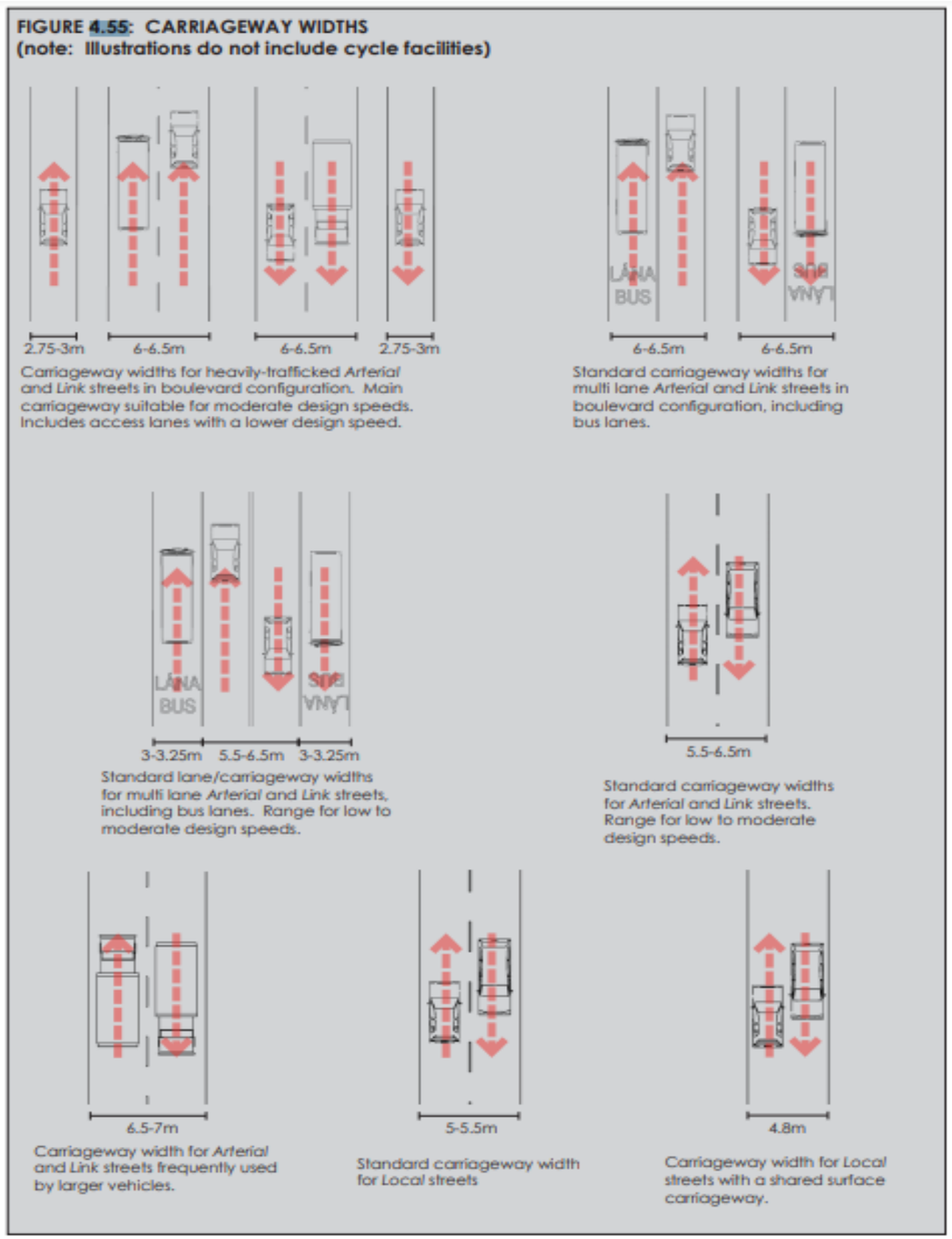

Figure 27: Cross Section

Horizontal and Vertical Geometry

The alignment of the Dunmore Roads will be designed so that the various geometric elements including horizontal and vertical curvature and sight distance will have at least the minimum values consistent with the 50kph Design Speed with the exception of where the built environment constrains such standards and a bespoke design solution will be implemented. It is important that these geometric elements are not exceeded as this can lead to operating speeds greater than the intended Design Speed.

The relevant horizontal and vertical geometric design values are illustrated in DMURS Table 4.3 as shown in Figure 28 adjacent. A standard carriageway cross fall of 2.50% will be adopted throughout with super elevation applied if necessary noting that adverse camber is allowable under DMURS designs in accordance with Table 4.3. A cross fall of 2.5% will be used for footpaths and cycle facilities.

HORIZONTAL CURVATURE

Design Speed (km/h)	10	20	30	40	50	60
Minimum Radius with adverse camber of 2.5%	-	11	26	56	104	178
Minimum Radius with superelevation of 2.5 %	-	-	-	46	82	136

VERTICAL CURVATURE

Design Speed (km/h)	10	20	30	40	50	60
Crest Curve K Value	N/A	N/A	N/A	2.6	4.7	8.2
Sag Curve K Value	N/A	N/A	2.3	4.1	6.4	9.2

Table 4.3: Carriageway geometry parameters for horizontal and vertical curvature.

Figure 28: Horizontal & Vertical Curvature

Junction Philosophy

The primary principle in the design of junctions along the route will be to provide junctions that are safe and consistent with existing layouts in order to present a uniformity of approach to drivers. In addition junctions will have sufficient capacity to

accommodate design year peak traffic flows therefore optimising network capacity. The primary junction strategy objectives will be:

- To optimise road safety by ensuring adequate visibility and consistency;
- To ensure capacity for the design year;
- To function as traffic calming measures;
- To provide safe crossing facilities for pedestrians and cyclists;
- To provide an economic solution, so that the cost of implementing the design will be, to the maximum possible extent, offset by the economic benefits derived;
- To optimise road construction costs;
- To minimise environmental impacts, such as air pollution and engine noise, by minimising fuel consumption through reductions in the number of speed changes and the number of stop/starts required.

In the case of the Dunmore it is envisaged that the primary junction in village centre will be designed as controlled junction with all user crossing facilities and junction on northern side of river will be a priority T-junction.

Drainage Philosophy and Design

The general principals behind the drainage design will be as follows

- The existing surface water drainage network regime of the area will be utilised;
- The design will ensure continuation of existing overland flows;
- The drainage of the proposed road will be designed such that surface water drainage and sub-grade drainage will be provided for the mainline carriageway alignment alterations in horizontal and vertical alignments. This discharge will be passed through a petrol interceptor where required before discharge to an existing outfalls;
- The maintenance or improvement to the quality of the existing drainage network;
- The application of Sustainable Urban Drainage Systems (SDS) to the surface water drainage system where possible in-line with Galway County Council's SuDS standards;
- Rainfall intensities to be factored up by 20% to take into account climate change.

The road drainage for the scheme will be designed in accordance with the TII specifications. The elements of the drainage to be constructed will be constructed in accordance with the TII standard details. Any SuDS elements incorporated into the scheme will be designed in accordance with The SuDS Manual (published by CIRIA, 2007). All water courses that receive road discharge will be protected by measures to minimise the risk of pollution as recommended by the Inland Fisheries Board. The recommendations of the Department of the Marine & Natural Resources publication *Fishery Guidelines for Local Authority Work* will be adopted in the design of outfalls. The realignment is generally an upgrading of standards and as such can utilise the existing networks without significant alteration of the contributing area. Hence it is not envisaged that any significant attenuation capacity will form a part of the detail design.

Geotechnical Philosophy and Earthworks Design

The geotechnical processes and ground risk management for the scheme development will be assessed in accordance with the general principles of HD 22/08: '*Managing Geotechnical Risk*' of the UK DMRB. The earthworks design of the new road will be developed in accordance with the general principles of earthworks design and preparation of contract documents as outlined in TII DMRB. The earthworks design will ensure the stability of the embankments and cuttings, including rock cuttings, for a design period of 60 years. Earthworks in the design will follow the guidance contained in BS6031:2009.

The finished sloped surfaces of all embankments and cuttings (with the exception of cuttings through rock) will have a maximum gradient of 1 vertical to 2 horizontal. The design will ensure that areas of existing road pavement which shall be top soiled or which shall eventually be buried and incorporated in the Works below embankments shall be broken up to render the construction free draining. Strengthened earthworks design will be in accordance with BS8006-1:2010 *Code of Practice for Strengthened Reinforced Soils and Other Fills*.

The earthworks design will ensure that all necessary measures shall be taken to mitigate any adverse effects on the surrounding area and to prevent flooding, pollution and vibration. The design shall assume that topsoil shall be removed where covered by

embankment fill of less than 3 metres in height. The design shall consider the implications on embankment stability and settlement where topsoil shall be left in place beneath embankments as part of the earthworks design.

The design will include for cut-off drainage at the limits of earthworks where the adjacent ground slopes towards the earthworks. Any such cut-off ditches will have stable side slopes and, where required, such ditches shall be treated to prevent erosion. Geosynthetics / Geotextiles in the design will have a minimum operational life span of 120 years. The design will ensure that particular measures for dealing with peat and organic soils liable to significant secondary settlement effects shall be limited to:

- Soil Removal – excavation and replace all existing susceptible soils; or
- Supported Embankments – where the soft foundation soils are not subject to imposed loadings; or
- Soil Modification – in situ modification of soil stiffness and secondary compression characteristics by means of an appropriate methodology (if required) (Drainage and surcharge methods will only be examined for soils that do not exhibit significant secondary settlement effects.)

The design will pay due regard to the effects of settlement; including all settlement effects associated with the presence of peats and organic soft soils to ensure that settlement of embankments is prevented or otherwise provided for in the design. Design solutions are intended to ensure that the effects of primary consolidation and secondary compression, if not otherwise prevented, shall be substantially complete before the road pavement construction commences.

Road Pavement Design

The pavement of the new road will be designed in accordance with the *Structural Assessment and Maintenance Method* as outlined in the TII DMRB. It is noted that DMURS is silent on the structural design of pavements. The pavement shall be one of the following options depending on cost effectiveness:

- Fully Flexible Construction for either 20 or 40 year Design Life;
- Flexible Composite for 40 year Design Life;
- Rigid CRCP Construction for 40 year Design Life.

The design of the Capping Layer and the Sub-Base shall follow the requirements of the TII Standards: Foundations as noted earlier. The design depth of the pavement layers will follow the requirements of TII Standards based on the cumulative number of standard axles over the pavement life. The pavement materials to be used and method of construction will follow the requirements of the TII's *Specification for Road Works*.

Signage and Delineation

Directional and Regulatory Signage for the scheme will be provided in accordance with the Department of Transport '*Traffic Signs Manual 2019*' and the '*Road Traffic (Signs) Regulations, 1997*' and any subsequent amendments to these documents. All Regulatory and Warning signage will be consistent with the Design Speed of the mainline and secondary roads. All directional information signage will be consistent with the classification and Design Speed of the scheme. All advance directional signs and directional signs will be designed using the 'AutoSign' traffic sign design software. Road markings, reflective markings and studs shall be provided in accordance with the Department of Transport '*Traffic Signs Manual*' and in accordance with Series 1200 of the 'Specification for Road Works' as published by the TII. Temporary traffic signs during construction will comply with Chapter 8 the '*Traffic Signs Manual 2019*' and in accordance with Series 1200 of the '*Specification for Road Works*' as published by the TII.

Public Lighting

Lighting Design will be in accordance with the requirements of BS 5489-1 (2013) Code of Practice for the Design of Public Lighting and ISEN 13201-2 (2015) Road Lighting Part 2, Performance Requirements and Galway County Council Guidelines. The lighting design is proposed to utilise lighting columns whose height is sensitive to the scale of the built and planned environment. In accordance with DMURS 4.2.5 only white light sources will be considered in the design of street lighting. The installation of the lighting network will comply with the requirements of the '*Specification for Road Works*' as published by the TII and in accordance with the recommendations of BS5489 and BS5649. Full cut-off lanterns will be utilised to minimise night-time visual intrusion if required.

6. Route Options

6.1 General

A total of six alignment options as mentioned below has been considered for the multi criteria analysis.

- A Do Nothing Option;
- A Do Something Option 1 – Improvements along Castle Street and Bridge Street, widening the road to the west of Bridge Street (Green).
- A Do Something Option 2 – Improvements along Castle Street and Bridge Street, widening the road to the east of Bridge Street (Blue).
- A Do Something Option 3 – New road from Barrack Street over the Sink River to meet the N83 at the Bridge Bar (Red).
- A Do Something Option 4 – Extend the cul-de-sac along Castle Street over the river, to create a new junction with the N83 (Magenta).
- A Do Something Option 5 – A new road to the west of the town which would create a link between Castle St and the N83 (Cyan).

Each options except the Do Nothing Option considers upgrading of the junction at the Bridge Bar. The merits and demerits of all the options has been discussed in turn below. Thereafter, all of the Options are considered in a multi-criteria assessment in order to determine an Emerging Preferred Route. A copy of the each route option is included in Appendix A.

6.2 Do Nothing Option

The Do Nothing option means maintaining the status quo. Thus, the fundamental aim of improving the roads infrastructure of the Dunmore and the aim of regeneration of the village would not be realised. In addition, the recent regeneration investment fund allocated to the village of Dunmore and the aspirational revitalisation of the village will not be progress.

The N83, categorised as a National secondary road, is an important strategic route on the National Road network. The N83 is also a strategic link in Galway which is a locally and regionally important route as it provides connectivity between regional centres. The provision of the N83 upgrade in Dunmore is in compliance with Transport Infrastructure objective number 8 of the Galway County Development Plan, to review the Dunmore Traffic Management Plan. N83 Bridge Street in Dunmore is presently between 3.4 and 4.5 metres wide at Bridge Street, Dunmore. There is a necking effect which leads to an informal STOP/GO arrangement and occasional mounting of the footpath by vehicles.

It is evident then, from all of the foregoing, that the adoption of a Do Nothing option would be unsustainable in the context of the proper planning and development of Dunmore.

6.3 Option 1: Green Alignment

Option 1 considers improvements along the Castle Street and the Bridge Street, widening the road to the west of Bridge Street (Shown as Green Alignment in Figure 29).

Figure 29: Option 1 Green Alignment

This is short option with no material additional length in comparison to existing route. The construction of this option would include demolition of the existing buildings and would have major part of works online compared to most of the other options. This option provides opportunities and would promote village revitalisation. The option will improve quality and reliability of traffic with facilities for pedestrians. Due to the alignment of the existing listed bridge it is not possible to provide an alignment here that meets current design standards and ties in adequately with the bridge and the Square. The alignment requires a horizontal curvature that is too tight to allow safe transit of vehicles along the new street. This option will however improve Bridge Street and also the junction at the Square by providing additional width even if not to standard.

This route is designed to facilitate an upgrade of the junction of the N83 and the R360 at Sion Hill – Gater Street. The new junction will facilitate improved pedestrian facilities, improved visibility and better junction legibility. This junction will require further analysis to confirm its typology and priority.

The proposed re-alignment of Bridge Street is within the zone of notification surrounding the historic town of Dunmore but no Protected Structures or buildings recorded in the National Inventory of Architecture are impacted by this route.

6.4 Option 2: Blue Central Alignment

The Blue alignment runs along Bridge Street on east side. The Study Area is shown outlined in Red line below

Figure 30: Option 2 Blue Alignment

This is short option with no material additional length in comparison to existing route. The construction cost would include demolition of the existing buildings but this option won't need a new bridge on the sinking river and also this option would have major part of online road compared to other options. This option provides opportunities and would promote village revitalisation. The option will improve quality and reliability of traffic with facilities for pedestrians. The route can be designed to current standard.

This route is designed to facilitate an upgrade of the junction of the N83 and the R360 at Sion Hill – Gater Street. The new junction will facilitate improved pedestrian facilities, improved visibility and better junction legibility. This junction will require further analysis to confirm its typology and priority.
This option will improve Bridge Street and also the junction at the Square.
The proposed re-alignment of Bridge Street is within the zone of notification surrounding the historic town of Dunmore but no Protected Structures or buildings recorded in the National Inventory of Architecture are impacted by this route.

Due to the alignment of the N83 on High Street the Eastern widening of Bridge Street has the best horizontal tie-in of any of the routes at this junction.

6.5 Option 3: Option 3 Red Alignment

The Red alignment joins Barrack Street to R360 Junction east of Bridge Street. The Study Area is shown outlined in Red line on Figure 31.

This option would constitute the provision of a new section linking Barrack Street to R360 / N83 junction. It will include demolition of the existing fuel station and would also need a new road-bridge on the Sinking River. This option would see majority of its stretch as new offline carriageway. It will be a longer option in comparison to options 1 and 2. This option provides opportunities and would promote village revitalisation. The option will improve quality and reliability of traffic with facilities for pedestrians. The route can be designed to current standards. The priority of the T-junction to the N83/R360 could accommodate a change using this alignment.

This option will not improve alignment on Bridge Street however the junction at the Square will be improved. This option also has a detrimental effect on a number of live businesses in the town.

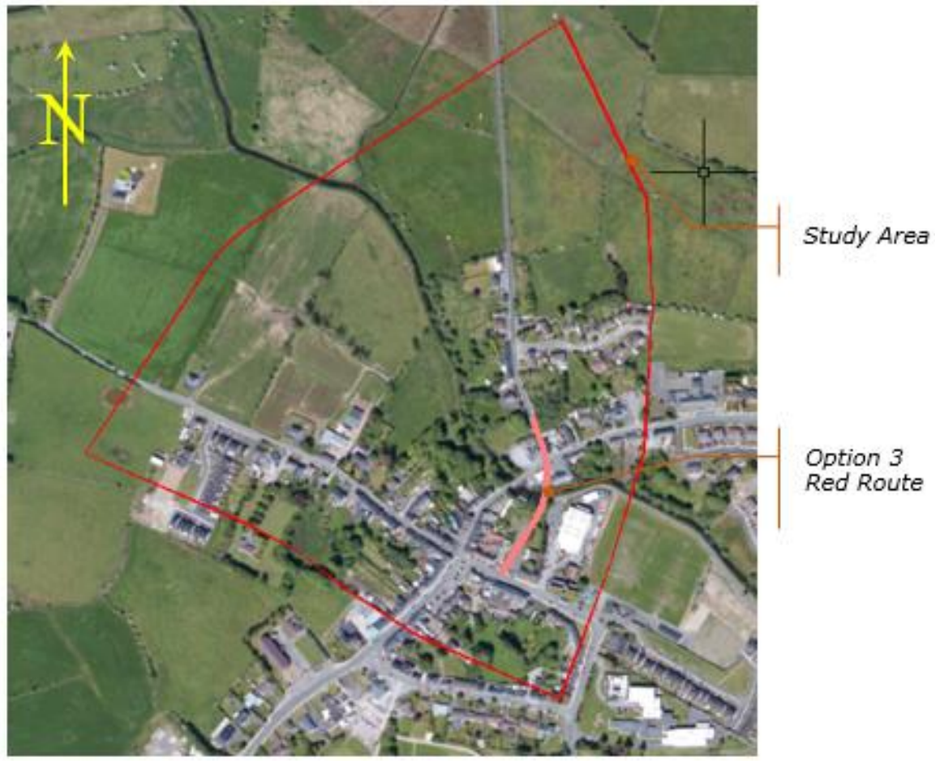

Figure 31: Option 3 Red Alignment

The proposed re-alignment is within the zone of notification surrounding the historic town of Dunmore but no Protected Structures or buildings recorded in the National Inventory of Architecture are impacted by this route. However the route is located immediately west of The Bank of Ireland Building - recorded in the National Inventory of Architectural Heritage (Reg. 30330009) and is located 43m west of the Augustinian Friary - a National Monument (Reg. No. 273) and a Protected Structure (No. 20). It is noted that previous excavations on barrack Street have uncovered mass burials close to the Augustinian Friary.

The route would have slight to moderate impact on local geology due to excavations and construction of bridge. Generally this option will improve access and help on the deprived geographical area- however it will detract from the free flow accessibility by the introduction of more torturous route to negotiate the area.

6.6 Option 4: Option 4 Magenta Alignment

The Magenta alignment joins Castle Street to N83 west of Bridge Street. The Study Area is shown outlined in Red line below

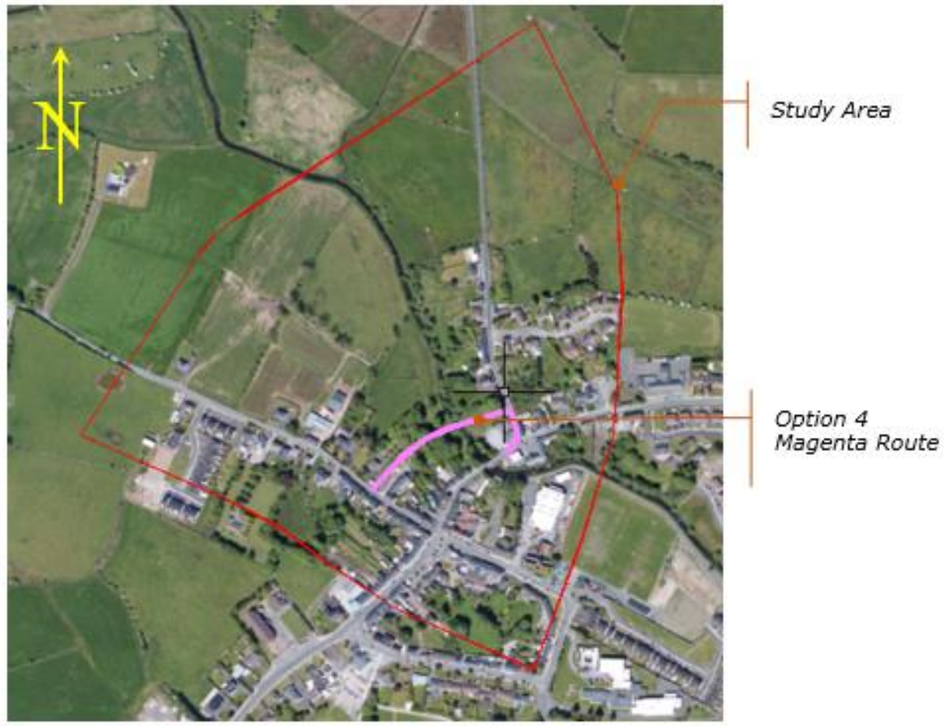

Figure 32: Option 4 Magenta Alignment

This option would constitute the provision of a new section linking Castle Street to N83. It will include a new road bridge on the Sinking River. This option would see majority of its stretch as new offline carriageway. It will be a longer option in comparison to options 1, 2 and 3. This option provides opportunities and would promote village revitalisation. This option would slightly improve the quality and reliability of the transport compared to the present scenario with facilities for pedestrians however it will introduce a rather tortuous N83 path especially for larger vehicles. The route can be generally be designed to current standards, however the South Western corner of the junction of High Street and Castle Street could not be accommodated to a current standard without demolition

on High Street and the south of Castle Street. This option will not improve Bridge Street however the junction at the Square will be improved.

The route would have slight to moderate impact on local geology due to excavations and construction of bridge. Generally this option will improve access and help on the deprived geographical area- however it will detract from the free flow accessibility by the introduction of more torturous route to negotiate the area.

6.7 Option 5: Option 5 Cyan Alignment

The Cyan alignment joins Castle Street to N83 west of Bridge Street. The Study Area is shown outlined in Red line below

Figure 33: Option 5 Cyan Alignment

This option is the longest route and would constitute the provision of a new section linking Castle Street to N83 north of Dunmore. It will include a new road bridge on the Sinking River. This option would see majority of its stretch a new offline carriageway. It will be a longer option in comparison to options 1, 2, 3 and 4. This option provides opportunities and would promote village revitalisation, however it is further removed from the village centre. It is noted that in the public consultation the attendees expressed a desire to not have a solution which brought the traffic away from the village centre. This option would slightly improve the quality and reliability of the transport compared to the present scenario with facilities for pedestrians however it will introduce a rather longer tortuous N83 path especially for larger vehicles. This option would slightly improve the quality and reliability of the transport compared to the present scenario with facilities for pedestrians however it will introduce a rather tortuous N83 path especially for larger vehicles. The route can be generally be designed to current standards, however the South Western corner of the junction of High Street and Castle Street could not be accommodated to a current standard without demolition on High Street and the south of Castle Street. This option will not improve Bridge Street however the junction at the Square will be improved.

The route impacts significantly on Agricultural lands. The route would have slight to moderate impact on local geology due to excavations and construction of bridge. Generally this option will improve access and help on the deprived geographical area- however it will detract from the free flow accessibility by the introduction of more torturous route to negotiate the area.

The route could potentially affect the direction of development of the town away from its natural centre.

7. EMERGING PREFERRED ROUTE

7.1 General

Section 6 has set out and described 6 no. alignment options as follows:

- A Do Nothing Option;
- A Do Something Option 1 – Improvements along Castle Street and Bridge Street, widening the road to the west of Bridge Street (Green).
- A Do Something Option 2 – Improvements along Castle Street and Bridge Street, widening the road to the east of Bridge Street (Blue).
- A Do Something Option 3 – New road from Barrack Street over the Sink River to meet the N83 at the Bridge Bar (Red).
- A Do Something Option 4 – Extend the cul-de-sac along Castle Street over the river, to create a new junction with the N83 (Magenta).
- A Do Something Option 5 – A new road to the west of the town which would create a link between Castle St and the N83 (Cyan).

Each of the above has been assessed under a multi-criteria assessment matrix and the assessment results analysed in order to bring forward an Emerging Preferred Route for further design development. Prior to carrying out the assessment it is worth reviewing each of the options in a single figure. In this regard each of the 5 no. Do Something alignments is shown side by side in Figure 34 adjacent.

7.2 Assessment Criteria

The assessment criteria against which each route is being considered are as follows:

- 1)Economy-Considering Transport Efficiency and Effectiveness, Wider Economic Impacts, Funding Impacts, Transport Quality and Reliability
- 2)Safety & Design Standards–Road/Street User Safety, Security, likely reduction in collisions and ability to achieve design standards
- 3) Environment-Assessing the effects on various aspects of environment such as Flora and Fauna, Architectural and Cultural Heritage.
- 4) Accessibility & Social Inclusion–Deprived geographical areas and vulnerable groups.
- 5)Integration–Consideration of the routes relating to Transport Integration, Land Use Integration, Geographical Integration and other government policy integration providing regional balance.
- 6)Physical Activity–Under this criteria, the options were ranked by consideration of the Ambience, Absenteeism (loneliness)

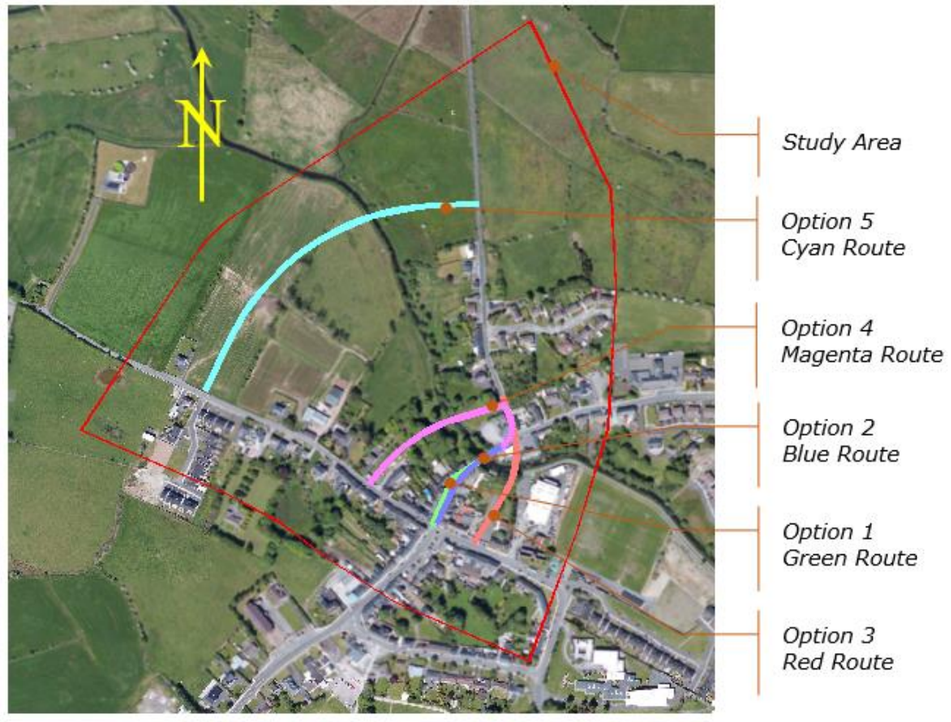

Figure 34: All Alignments

SUMMARY OF EMERGING PREFERRED ROUTE OPTIONS

The table below shows the relative rankings of each of the alternative options against the various assessment criteria. The reasoning behind the rankings set out in the table is discussed, for each of the 6 no. Option routes, in the following section. Thereafter an Emerging Preferred Route is selected for further consideration and design development.

DUNMORE MCA OPTIONS SCORING SUMMARY

	Economy	Safety & Design Standards	Environment	Accessibility & Social Inclusion	Integration	Physical Activity	Total
Option 0_Do Nothing	12	3	49	2	9	4	79
Option 1_Widening on West Side (Green Route)	23	14	34	7	20	10	108
Option 2_Widening on East Side (Blue Route)	23	20	34	10	21	10	118
Option 3_Semi-Bypass from Barrack Street to N83 (Red Route)	18	15	30	6	17	12	98
Option 4_Semi-Bypass from Castle Street to N83(Magenta Route)	13.5	15	32.5	4	14	13	92
Option 5_Bypass from N83 to Castle Street (Cyan Route)	13.5	14	29.5	2	12	15	86

Figure 35 Summary of Multi Criteria Analysis

7.3 Discussion

While the multi-criteria analysis should be read in full to glean the full reasoning and considered opinion of the comprehensive analysis carried out by the authors we have summarised the principle findings in a comparative discursive format below to facilitate simplified interpretation of the process.

Do Nothing Option:

The Do Nothing option scores badly in terms of safety and village centre revitalisation with the aim of the scheme for regeneration of Dunmore and given that no dedicated route is being provided nor will the N83 be improved the economic impacts coupled with transport quality and reliability are scoring low. The route also scores low in terms of physical activity, Accessibility and Social inclusion. Given that the Do Nothing option does not involve any construction, this option has no *little environment impact*. Overall this route scores the lowest figure and is not an option.

Option 1 and Option 2 Green and Blue Route Options:

The summary of these routes can be combined since both are substantially on the line of Bridge Street. However the existing cross section template for Bridge Street is not sufficiently wide enough to accommodate the new road template cross section or to accommodate the manoeuvres at junctions. Hence the options are widening of either the east side or the west side. The scheme on the east side scores better on safety and design and this is largely due to the nature of alignment where widening is on inside of curve and the ability to achieve better continuity with the existing built environment and road continuation onto existing network. The other separating factor is that the eastern alignment has a more natural tie-in to High Street.

Option 3: Red Route Option:

This option has additional length in comparison to option 1 and 2 and involves a new road bridge and demolition of a fuel station hence all these elements make for scoring less across most headings with the exception of physical activity where it scores better than previous options. Overall it achieves a lower score that option 1 or 2.

Option 4: Magenta Route Option:

This option has additional length in comparison to option 1 and 2 and involves a new bridge, makes the route more torturous hence all these elements make for scoring less across for economic and integration headings. However it is akin to route 3 in relation to safety and design and scores better on physical activity. Overall this route achieves a lower score than previous options.

Option 5: Cyan Route Option:

This option has significant additional length in comparison to all other do something options and with the exception of physical activity scores lower on all headings. It involves a new bridge and has impact on both farm lands and environment. It does not address the aim of the regeneration to the level other options do and it scores the lowest of the Do Something options.

Emerging Preferred Route:

The Blue Route (Option 2) is the emerging preferred route.

The Do Nothing option is not considered an appropriate response to the Economic or Transport objectives or for the regeneration of Dunmore. The route does not alleviates Infrastructure issues nor provide for Dunmore with regeneration of revitalisation options. The route is therefore not recommended for further consideration.

Of the Do Something routes, the Cyan Route or Option 5 is considered to be the poorest response to the Dunmore requirements given its lack of ability to achieve the same outcomes as other routes coupled with its least economic outcome. The route also has the potential to impinge on local lands, whilst its junctions are further from village where speeds are likely to be greater. Option 4 is also on west side of village and achieves a better score by virtue that is nearer to village. It reflects the same trends in scoring as option 5 and is the second least favourable of the Do something options. Of the remaining three routes, the Red Route is considered to be the next least attractive option given it's off line construction, low economic rating and lesser integration element.

Of the remaining two do something options, Option 1 & 2 Green and Blue, the Blue Route or **Option 2 is considered to offer the best overall response to the criteria and the County Development Plan requirements**. It also is good for the regeneration of Dunmore in that it provides for an on line improvement on Bridge Street where the regeneration can potentially significantly improve the streetscape. This option has the benefit of not having to construct a bridge for traffic and has scored the best overall. The Route is therefore recommended as the Emerging Preferred Route for further design development.

8. Summary & Conclusion

This report sets out to identify an Emerging Preferred Route for the completion of the Dunmore N83 upgrading. The provision of the N83 upgrade in Dunmore is in compliance with Transport Infrastructure objective number 8 of the Galway County Development Plan, to review the Dunmore Traffic Management Plan. The N83 is a strategic National link in Galway which is a locally and regionally important route as it provides connectivity between regional centres. N83 Bridge Street in Dunmore is presently between 3.4 and 4.5 metres wide at Bridge Street, Dunmore. There is a necking effect which leads to an informal STOP/GO arrangement and occasional mounting of the footpath by vehicles. This upgrading fulfils the spirit of the regeneration funding and will provide Dunmore with the revitalisation that will promote the development of the area.

This study has systematically assessed the multi criteria elements, deemed appropriate for the assessment of such a scheme, and concluded with the recommendation of the Option 2 or the Blue route.

The first part of this report goes on to set out all of the identifiable constraints to the design and construction of the N83 Road. The various constraints considered include planning policy, granted and pending planning applications, archaeology, ecology, topography & site conditions, land ownership and soils & geology. In addition to the foregoing, consideration is also given to cost of construction and buildability issues as well as to the continuing impact on existing village of passing through traffic.