National Development Plan 2007 - 2013

Department of Transport, Tourism and Sport

National Roads Authority
An tÚdarás um Bóithre Náisiúnta

N24 CLONMEL BYPASS

Route Comparison Report

June 2011

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LOCAL AUTHORITY REVIEW

I hereby certify to the National Roads Authority that this document has been reviewed and accepted by South Tipperary County Council.

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TABLE OF CONTENTS

LIST OF TABLES AND FIGURES

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EXECUTIVE SUMMARY

The route selection process carried out for this project initially identified a preferred route in 2005. This Emerging Preferred Route option, known in this report as the '2006 EPR', along with the other route options and the associated Route Selection Report, was presented for public consultation in February 2006. Following this consultation, some submissions from the public requested that the 2006 EPR be moved further north in the area between the townlands of Newchapel and Kilmore. As a result of this South Tipperary County Council requested that Tramore House Regional Design Office (THRDO) undertake a route selection review focussed on this area. Upon completion of this review, this approved Route Comparison Report will be published as an addendum to the Route Selection Report, identifying the new preferred route option established in this report, and finalising the route selection process.

This report details the process of determining alterations to the existing 2006 EPR corridor to provide alternative routes for analysis and comparison, in the vicinity of the area identified above. Following public consultation and close consideration of the design requirements and identified study area constraints, two such potentially viable alternatives were identified.

This report compares and updates the impacts of the two alternative route options and the 2006 EPR in terms of the human environment, natural environment, safety and economics. The overall assessment of these impacts was undertaken in accordance with the National Roads Authority's 'Project Appraisal Guidelines', 'Project Management Guidelines' and Environmental Assessment Guidelines. The engineering assessment, a number of the environmental assessments and the economic assessment were carried out by Tramore House RDO. The remaining environmental assessments were undertaken by appointed specialists.

This report concludes that a hybrid route corridor, combining aspects of the 2006 EPR and one of the identified alternative routes offers the best solution and recommends that it be adopted as the preferred route for the scheme, thus superseding and replacing the previously identified preferred route corridor. The choice of road type for the route shall be consistent with the overall strategic policy for the N24 transport corridor, and is currently envisaged as a Type 2 dual carriageway. However it should be noted that the main purpose of the route selection process is to identify and confirm a preferred route corridor and that the determination of a road type and cross-section will not be made until the design phase when an incremental analysis exercise will be undertaken. This analysis will use an economic appraisal to examine and test different levels of carriageway intervention for the scheme.

It is also recommended that this Route Comparison Report be incorporated as an addendum to the Route Selection Report and be presented to the local authority representatives and be subject to public consultation prior to formal adoption.

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1 SCHEME OVERVIEW

1.1 Introduction

This Route Comparison Report has been prepared at the request of South Tipperary County Council, and in accordance with the NRA's 'Project Management Guidelines' and 'Project Appraisal Guidelines'. The scheme is currently at Route Selection Stage (Phase 3).

1.2 Background

Tramore House Regional Design Office (THRDO) was appointed by South Tipperary County Council in 2004 to undertake the design of the N24 Clonmel Bypass between the proposed Carrick on Suir Bypass and the N24 Rathkeevin to Cahir Road Improvement Scheme. The brief for the scheme included:

- Evaluation of the need for the scheme
- Recommendation of a route for the proposed bypass

The Constraints Study was approved by the National Roads Authority in September 2005 and the project proceeded to the Route Selection phase. This phase is ongoing.

A total of nine broad route corridors were examined as part of the route selection process. A preferred route was identified from these options and all were presented for public consultation in February 2006. As a result of this public consultation, a significant number of submissions were received. Many of these submissions related to issues between the townlands of Newchapel and Mullenaranky. A substantial number of the submissions requested that the Emerging Preferred Route (see Figure 1 below), known as the 2006 EPR, be re-examined to see if it was possible to move the corridor to the north in this area. South Tipperary County Council requested that Tramore House RDO investigate this possibility.

During the Route Selection process, a corridor to the north of the 2006 EPR was assessed and rejected. The findings of the previous Constraints Study and Route Selection processes and consideration of the public submissions received were utilised for the identification of viable alternative options to the north of the 2006 EPR. As a result, two localised alterations were developed. These are called 'Alternative Route 1' and 'Alternative Route 2' (see Figure 2 below). Comparative environmental analyses of the three options were undertaken over the relevant section concerned, approximately from chainage 1900 to chainage 10100.

A draft route comparison report was first compiled by Tramore House RDO in November 2006. The report has been updated to reflect changes in the constraints within the study area and amendments to the best practice methodologies for assessing environmental impacts. This is particularly relevant with regard to a number of new properties that have been constructed within the study area and the assessment of air quality and noise impacts.

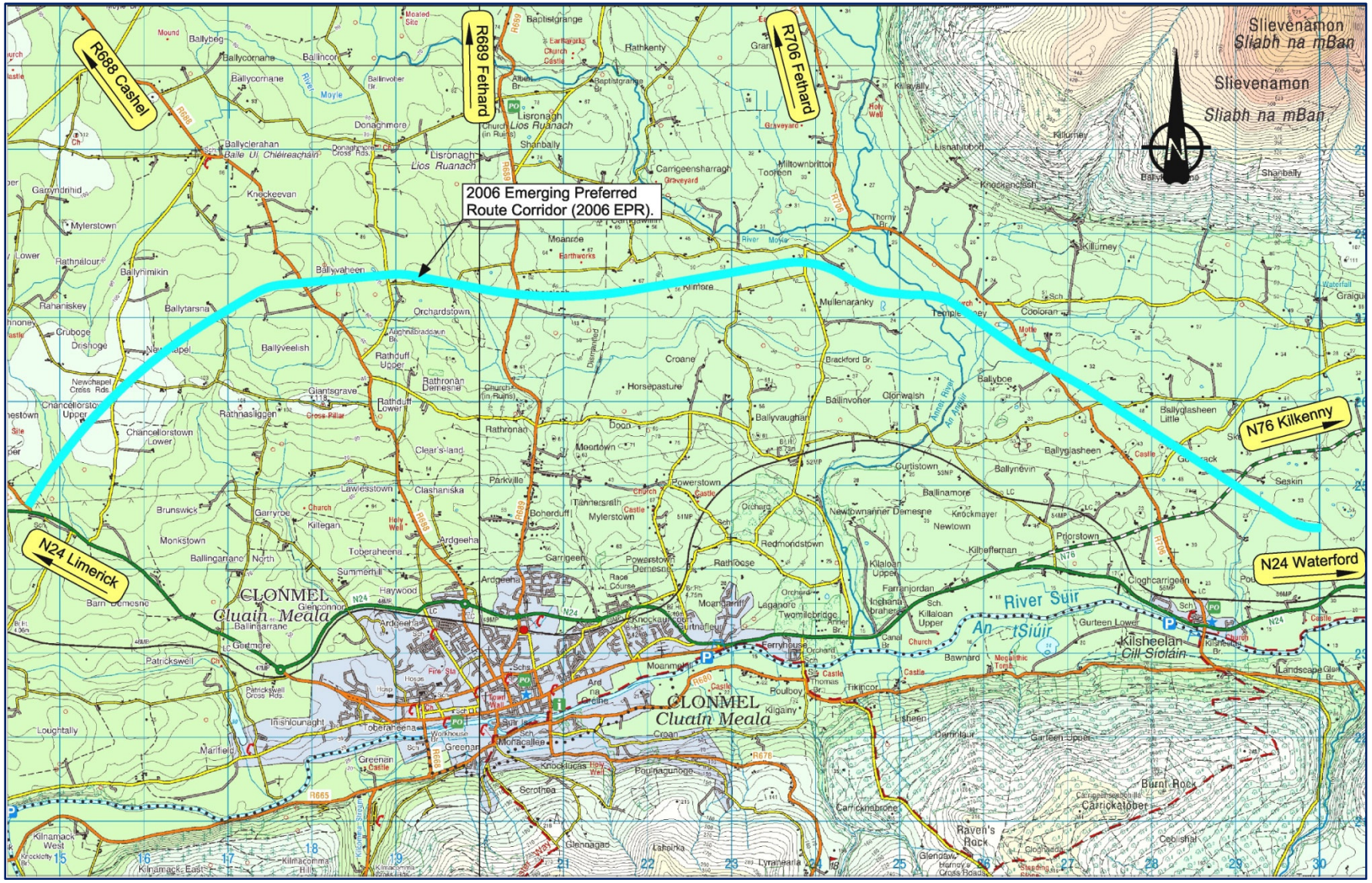

Figure 1: Current Emerging Preferred Route (2006 EPR)

1.3 Purpose of Report

In order to consider the new alternative route options fully it was necessary to undertake engineering, environmental, economic, safety and social assessments of the routes to allow an objective comparison with the selected route, and to assist in the confirmation of the best route option for the scheme. This report:-

- Describes the assessment process,
- Presents and describes two new, previously unidentified route options,
- Undertakes a comparative assessment of the new alternative route options and the 2006 preferred route corridor,
- Describes the technical evaluation of the route options and identifies a preferred route for each of the specific relevant subjects in the areas of the natural environment, human environment, economics and safety.
- Considers the overall balance of impacts and recommends a preferred route for the scheme.

The overall objective of the report is to confirm and recommend a preferred route for inclusion in the Route Selection Report to be approved by South Tipperary County Council.

1.4 Future Programme

By virtue of its proposed cross section and length, the scheme comes under the category of prescribed road development that requires an Environmental Impact Statement. Upon confirmation of the best route option for the scheme and approval of the Route Selection Report, it is proposed to develop the preliminary design, EIS and CPO.

2 DESCRIPTION OF ROUTE OPTIONS

2.1 General

The alternative route options are contained within a narrow study area extending approximately 1km to the north of the 2006 EPR and approximately 8km in length, from the townland of Newchapel at the western periphery of the study area to the townland of Kilmore to the east. These corridors were developed primarily with regard to physical constraints that necessarily confined their extent. The primary physical constraints that were considered were residential and commercial development, existing roads, land holding boundaries and the river Moyle. The corridors were further refined having regard to topography, archaeology and architectural heritage, and ecology. This process led to the definition of two broad route corridors, as described below.

2.2 Development of Alternative Route Options

In developing viable route alternatives, the constraints previously identified in the 'Constraints Report' were examined, and the following specific issues were also considered:-

- Requests included in the submissions to try to move the 2006 EPR to the north in the Orchardstown section of the study area.
- Preferences expressed to move the route as close to existing land boundaries as possible to minimise land severance.
- Locating suitable tie-in points for the alternative routes to re-join the 2006 EPR. In determining suitable locations, avoidance of existing commercial and residential developments was the minimum standard used.
- One of the main disadvantages of the original northern route option was the requirement to cross the river Moyle. Therefore alternative route options were considered that did not require a crossing of the Moyle.
- Avoidance or minimisation of impacts on all archaeological and cultural heritage sites also influenced the choice of alternative routes. To this end recorded archaeological sites in Ballyvaheen, Orchardstown, and further north towards Lisronagh had a constraining factor on alternative route locations.
- Again, further east, recorded sites in Caherclogh through Kilmore determined possible tie-in locations to the 2006 EPR. This is shown most clearly in public submissions proposing the rejoining of the 2006 EPR in the Moanroe area, encompassing a registered archaeological site. After consideration it was decided to rejoin the 2006 EPR further east away from any registered archaeological sites and with a wider gap between residences on the local road (Alternative Route 1).

2.3 Alternative 1

Alternative Route 1, (see Figure's 2 to 5 below) separates from the 2006 EPR in the townland of Newchapel at chainage 1900. It runs in a north-east direction, initially to the south of the 2006 EPR. It crosses the 2006 EPR in Ballytarsna at chainage 3100 and continues north-east until it

crosses the R688 at chainage 4300 (Knockeevan). It then runs in an easterly direction, crossing a local road at chainage 5450 (Orchardstown West) before crossing the R689 at chainage 7030 (Caherclogh) and passes between two recorded archaeological sites between chainages 6200 – 6500. The route then runs eastwards crossing another local road at chainage 8440 (Moanroe) before turning south-east, crossing a local road at chainage 9400 (Kilmore) and rejoining the 2006 EPR at chainage 10350 (2006 EPR chainage 10100). The divergent section of the route is 8.45km in length.

2.4 Alternative 2

Alternative Route 2 (see Fig's 2 to 4 below) separates from the 2006 EPR in the townland of Ballyveelish at chainage 3400. It runs in a north-east direction to the north of the 2006 EPR crossing the R688 at chainage 4300 (Knockeevan) and continues until it crosses a local road at chainage 5420 (Orchardstown West). It then runs between two recorded archaeological sites between chainages 6300 – 6600, before turning south-east, crossing a local road at chainage 6730 (Orchardstown West), then the R689 at chainage 7200 (Caherclogh) and finally rejoining the 2006 EPR at Chainage 7500 (2006 EPR chainage 7220). The divergent section of the route is 8.48km.

2.5 2006 Preferred Route Corridor Option

The Emerging Preferred Route (see Figure's 2 to 5 below) separates from the alternatives developed at chainage 1900 (Newchapel). The route goes through Newchapel to Ballyveelish North. Next it crosses the R688 at Ch 4300. The route continues in an easterly direction through Ballyvaheen and crosses two local roads at Orchardstown (Ch 5300 and Ch 6200). At this point the route swings slightly south to cross the R689 at Ch 6900 near Caherclogh. Again it runs east until Alternative Route 1 rejoins it at chainage 10100.

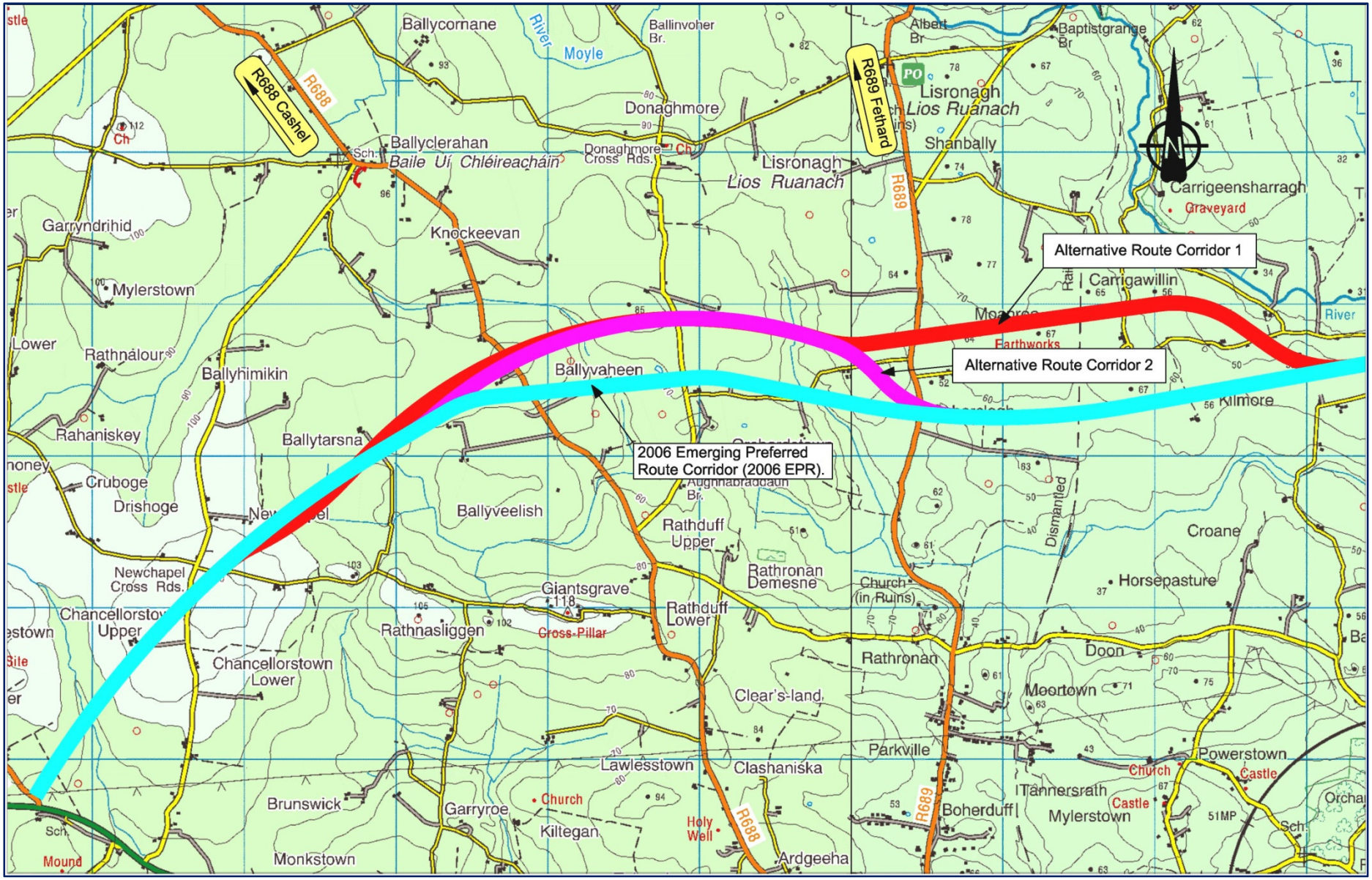

Figure 2: Route Options Layouts

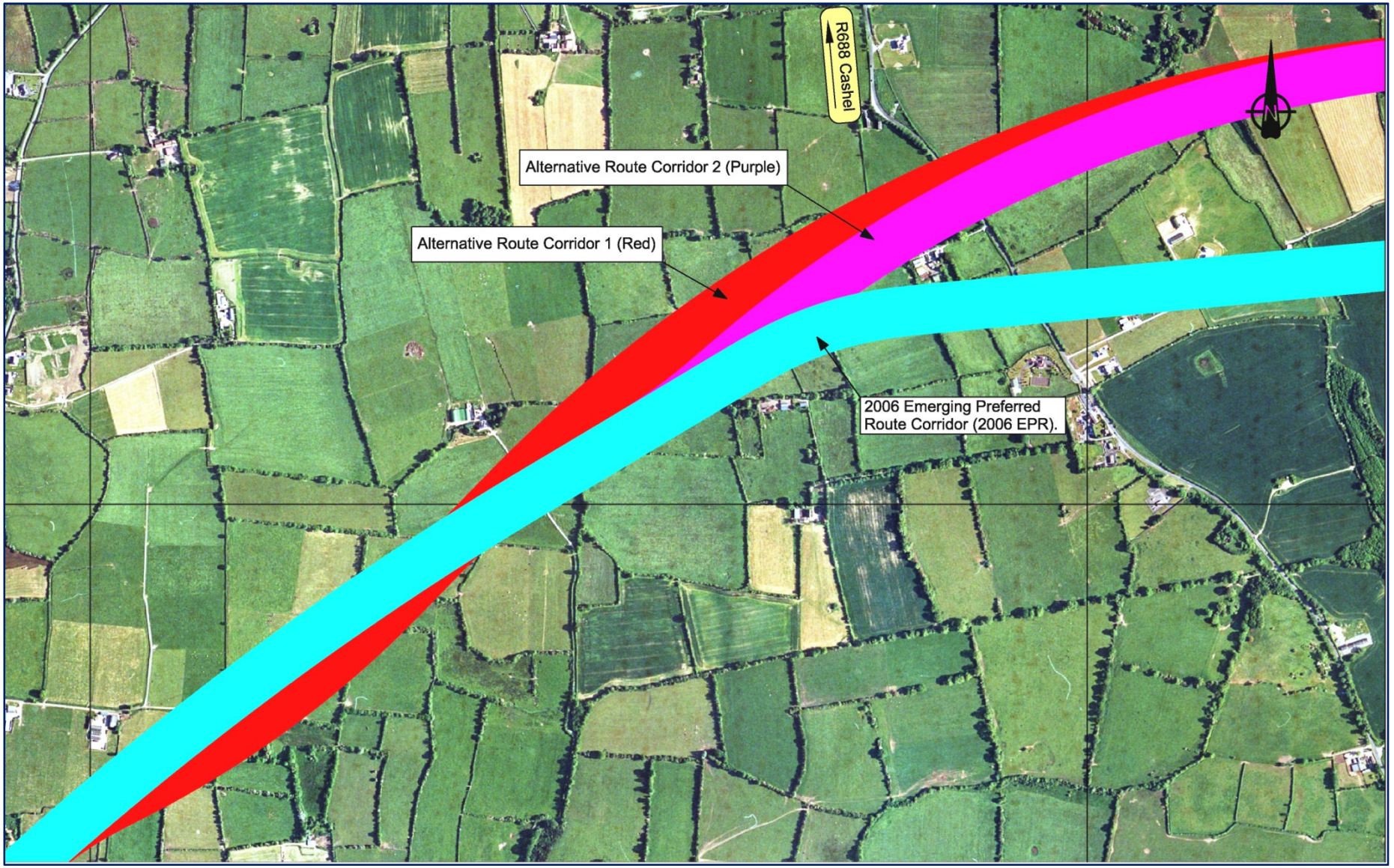

Figure 3: Preliminary Route Alignments (1 of 3)

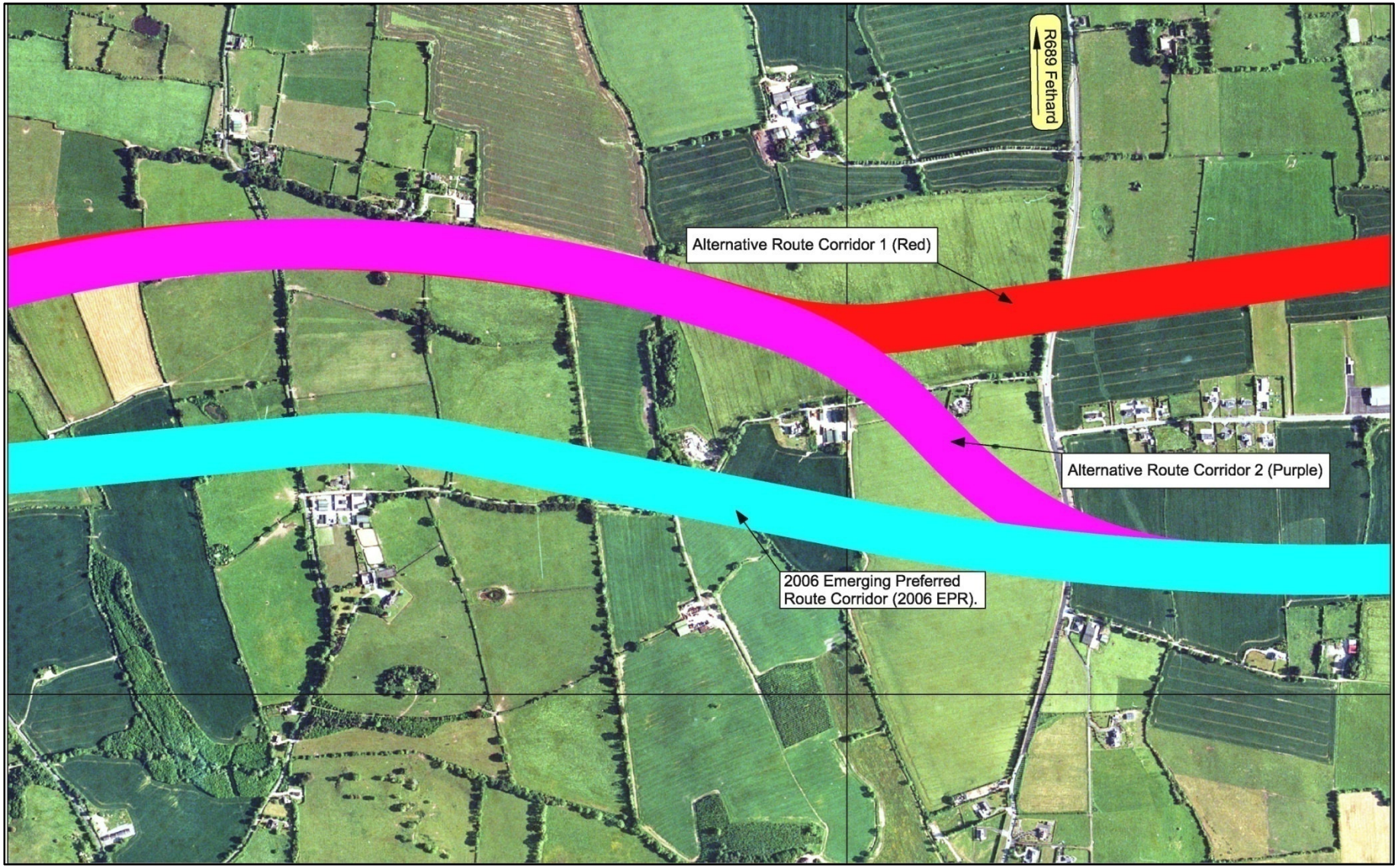

Figure 4: Preliminary Route Alignments (2 of 3)

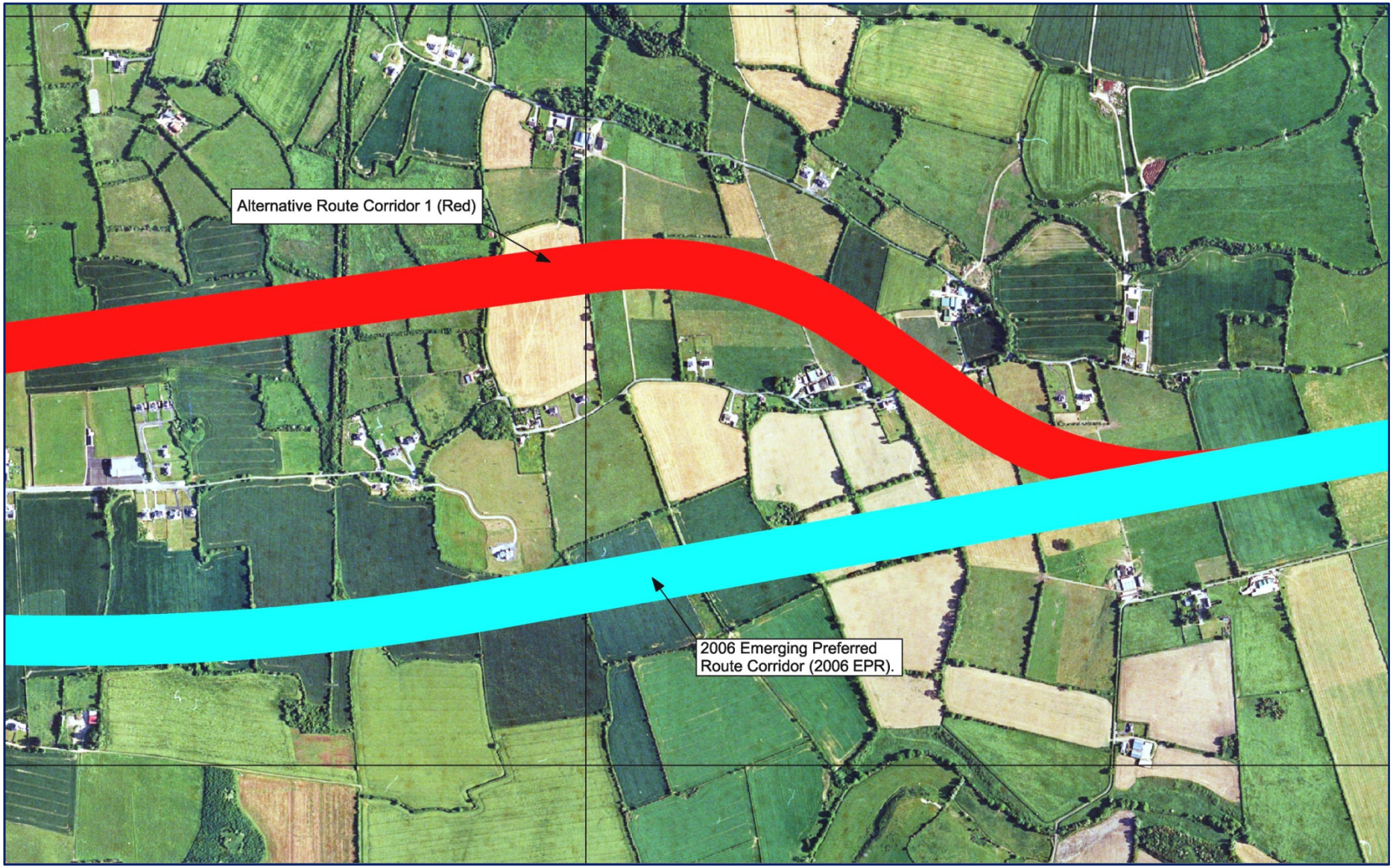

Figure 5: Preliminary Route Alignments (3 of 3)

3 ENGINEERING COMPARISON

3.1 General

This section describes the engineering assessment of the alternative routes and the 2006 EPR. This assessment is descriptive and is not included in the overall comparative assessment of the route options. However, the specific engineering characteristics of the route options significantly influence the environmental and economic impacts assessed in the following chapters.

3.2 Traffic

Given the close similarities of the route options in terms of road type, overall length, junction location and type, it is considered that all options will have very similar traffic characteristics.

3.3 Junctions

The junction strategy to be implemented will be the same for all of the route options. Two regional roads are crossed by the routes within the current reduced study area, the R688 to Cashel and the R689 to Fethard. The original Route Selection Report proposed a junction strategy that would accommodate both roads via a single junction. The location of this junction has yet to be determined but is not dependant on the particular route chosen and therefore will not affect the overall route comparison. There are to be no direct accesses along the proposed scheme and no junctions with local roads. Given that the alternatives and the 2006 EPR will all include the same junction configuration over the section concerned, all routes have again been judged equal in status for the purposes of assessment.

3.4 Minor Roads

Several minor roads will be crossed by each of the route options. The general strategy will be to provide either an overbridge or an underbridge according to the suitability of the ground profile. It is proposed to close one local road with Alternative Route 1. This particular road is not affected by either of the other routes, has very low traffic volumes and has a relatively short diversionary route available. It should be noted that Alternative Route 1 crosses one more minor road that either Alternative Route 2 or the 2006 EPR. As Alternative Route 1 crosses one more local road and proposes the closure of a local road it is considered to have a slightly more negative impact.

3.5 Route Lengths

The total lengths of each of the route options within the reduced study area are shown in Table 1, along with the approximate lengths of side roads required.

	Emerging Preferred Route	Alternative Route 1	Alternative Route 2
Total Scheme Length	8.20km	8.45km	8.48km
Side Roads	2.05km	2.5km	2km

Table 1: Route Lengths

3.6 Structures

The types of structures that need to be considered for the route alternatives are as follows:

- Regional and Local Road Crossing
- River and Stream Crossings
- Railway Crossings

In this assessment none of the routes being considered have either a rail or a river crossing. All routes cross two regional roads. In accordance with the proposal to provide a Type 2 dual carriageway road type, a single grade separated junction is proposed to service both of these roads. The location of such a junction has yet to be determined. New link roads will be provided as necessary between the junction and both regional roads.

The 2006 EPR and Alternative Route 2 both cross two local roads as well as the two regional roads identified above. Alternative Route 1 crosses one of these local roads and two other additional local roads, thereby in total crossing one more local road than the other two options. However, as described in section 3.4 above, it is proposed to close this local road at its interface with the route, and therefore a structure will not be provided. All other local and access roads crossed by the routes will be realigned as necessary and an overbridge or underbridge provided. Land severance is to be dealt with through the provision of access roads or underpasses; whichever proves most appropriate and economical.

All options shall require the same number and type of structures and are therefore considered to be of equal standing.

3.7 Number of Demolitions

No necessary demolitions have been identified for any of the options.

3.8 Earthworks Balance

In order to compare meaningful figures, the earthworks balance is examined over the full sections of the particular routes. It is assumed at this stage that 10% of all excavated material will be unsuitable for reuse. The quantities of cut and fill over this section are tabulated below. From this it can be seen that Alternative Route 1 has the least amount of required excavation and the best balance of cut and fill and is therefore the more favourable option in this category. The 2006 EPR is the least favoured option.

	Emerging Preferred Route	Alternative Route 1	Alternative Route 2
Approx. Volume of Cut	1,555,000 m^3	1,360,000 m^3	1,540,000 m^3
Approx. Volume of Fill	1,160,000 m^3	1,545,000 m^3	1,270,000 m^3
Approx. Additional Material Required	0 m^3	320,000 m^3	0 m^3
Approx. Volume of unsuitable material to be disposed	155,000 m^3	135,000 m^3	155,000 m^3
Approx. Volume of excess material to be disposed	240,000 m^3	0 m^3	115,000 m^3
Ratio of Cut to Fill	1.35	0.88	1.21

Table 2: Summary of Earthworks Balance

3.9 Constructability

This scheme involves construction in an entirely new route corridor rather than on-line construction within an existing corridor. This means that the construction will be primarily greenfield construction. With regard to interaction with regional and local traffic within the differing sections of the route options, Alternative Route 1 crosses one more local road than both Alternative Route 2 and the 2006 EPR. The number of regional roads crossed is the same for all three options and so the provision for existing regional road traffic will be the same for the route options.

Given that the route options are so similar in terms of their constructability, all three routes are considered equal in this category.

3.10 Services & Utilities

The construction of either of the route options will necessitate the temporary or permanent diversion or relocation of existing utilities. The significant utility constraints within the area are as follows:

- Gas (Bord Gais)
- Electricity (ESB)
- Telecommunications (Eircom and Esat)
- Cable Television (Chorus)
- Water and Wastewater Services (South Tipperary County Council)

3.10.1 Gas

The Bord Gais network consists of high pressure steel transmission pipelines as well as medium pressure distribution lines. The three transmission pipelines in the area are the Cork-Dublin Pipeline (No. 06), the Ballyveelish to Clonmel Pipeline (No. 10), and the Ballyveelish to Waterford Pipeline (No. 25).

All three routes cross pipeline no. 06 once, at Orchardstown and pipeline no. 10 in Ballyvaheen. The 2006 EPR, Alternative Routes 1 and 2 have been given an equal weighting with regard to the gas utility.

3.10.2 Electricity

None of the routes being considered cross the 38kV or 110kV lines in the study area. All will cross low voltage lines that need to be taken into consideration. All the routes will have an equal difficulty with the existing low voltage lines, thus they have all been given the same weighting with regard to electricity.

3.10.3 Telecommunications

Underground and overhead Eircom telecommunications services are present throughout the study area and as such the same measures would be required for all routes. Other networks are located within Clonmel town only and would be unaffected by all the route options. Again an equal weighting has been applied.

3.10.4 Cable television

Chorus cable television services are located only within the town of Clonmel and therefore are unaffected by any of the route options.

3.10.5 Water and Wastewater Services

All routes will affect water and wastewater services and the usual precautions will be required. Alternative Route 1 will cross one more watermain than either of the other two options being looked at. Therefore it has been given a slightly less favorable ranking than either the 2006 EPR or Alternative Route 2.

3.10.6 Conclusion

In the majority of the criterion assessed, all three route options were considered equal. Under the heading of Water and Wastewater Services, Alternative Route 1 is less favourable than the other options due to the number of watermains crossed. As a result, Alternative Route 2 and the 2006 EPR are selected as the preferred routes in the area of Services and Utilities.

3.11 Stage F Road Safety Audit

The NRA DMRB standard for Road Safety Audits, HD 19/08, states that a Stage F Road Safety Audit should be undertaken at route selection stage. However, all three route options being assessed in this report are very similar in terms potential safety issues. All are designed as high quality dual-carriageways with the same terminal and intermediate junction strategies. In addition, none of the routes have direct access points to the mainline. Side road realignments and crossings are also very similar for all options. Therefore, all route options are considered to have very similar safety characteristics, and none are considered to contain inherent safety hazards.

For these reasons a Stage F Audit was not considered necessary for the purposes of this report. A Stage 1 Road Safety Audit will be undertaken on the selected route upon completion of the preliminary design.

3.12 Drainage

This section studies the engineering impacts of drainage only. Impacts on aquatic and riparian ecology and water quality associated with drainage watercourses are studied in section 4.4 below. Impacts on the hydrology and drainage characteristics of the area are studied in section 4.8 below.

A detailed drainage design has not been undertaken at this stage. However, the design of the vertical alignment, of each of the options, was carried out with the locations of outfalls and drainage points taken into account. The road drainage network will be designed in accordance with contemporary standards and best practice. The design of all watercourse culverts will be subject to the approval of the Office of Public Works (OPW) under Section 50 of the Arterial Drainage Act. Consultations shall also be undertaken with the OPW and the Southern regional Fisheries Board (SRFB) with regard to any proposed channel realignments. The drainage network shall be designed so that surface water and sub-grade drainage will be accommodated for the carriageways and directed to an existing watercourse. Measures for the control of increased run-off and pollution shall be incorporated, where identified as being necessary, by means of retention and attenuation.

In summary, all three route options are considered to be equal under this criterion.

3.13 Conclusion

Over the eleven criteria assessed, a clear preferred route was only identified in four. This illustrates the similarities between the three options in terms of engineering. Despite these similarities however, the results do show that Alternative Route 2 is favoured in more categories than the other options and is therefore selected as the preferred route under the Engineering Comparison. Alternative Route 1 is the least preferred option.

4 ENVIRONMENTAL ASSESSMENT

This section assesses and compares the environmental impacts of the three route options using the specific criteria applicable from the NRA publication 'Environmental Impact Assessment of National Road Schemes'.

4.1 Agriculture & Land Use

This section summarises the potential agricultural impacts of the three route corridors, and outlines the comparative assessment of the routes as examined by Philip Farrelly & Co. Agricultural Consultants. The initial agricultural route comparison report and letter of revision from the consultant, complied as part of this assessment, are attached in Appendix A.1.1 and Appendix A.1.2 respectively.

The assessment consisted of a desktop study of available information and scheme mapping, and a roadside survey of the land types and uses. It considered the impacts of the routes on agriculture in terms of the quantity of land parcels, land quality, land use, land severance and farmyard disturbance. The initial assessment was carried out in early 2006 and did not identify any of the route options as being preferred. It was determined at this time that there would be no significant difference between the impacts of any of the three options. Following a further refinement of the assessment and sensitivity analysis, Alternative Route 2 was identified as the preferred route under the heading of Agriculture and Land Use.

In order to minimise disturbance to agriculture in the form of severance and impacts on farms, the chosen route should be located, in so far as is possible, close to farm boundaries. This is particularly important if there is a general consensus amongst affected landowners that such moves would lessen the impact of the proposed road on agriculture at a local level. Alternative Routes 1 and 2 have merit when taken in context of reducing the negative impacts on the holdings in the vicinity of Orchardstown Stud. On this farm and the adjoining farms there would be less land left severed from the main holding and the road would be further away from their respective farmyards. As a result these farms would suffer less injurious effects and disturbance. The South Tipperary County Development Plan 2009-2015 identifies the importance of the bloodstock industry to the area and seeks to "balance the need for rural based economic activity with the need to protect, promote and enhance the viability and environmental quality of existing equine operations…." However, the overall positive or negative impacts on agriculture of the alternative route options can only be ascertained when the effects of moving the route in a northerly direction are assessed in terms of all landowners potentially affected. Though the potential benefits of moving the route northwards would be positive for the above land owners, there will be corresponding negative effects on other landowners further up and down the alternative routes.

Both proposed Alternative Routes 1 and 2 cause two farms to be impacted upon in the town land of Knockeevan that would not be impacted upon by the 2006 EPR. Even though the severance of

these farms may be minor it adds two further farms to the number of farms that will be severed in some way. Alternative Route 1 will also cause a number of farms to be impacted upon in the townland of Moanroe that were not part of the 2006 EPR. On the other hand there would be a number of farms in Caherclogh that are on the 2006 EPR that would not be affected if Alternative Route 1 was chosen. There are two dairy farms in the townland of Carrigawillin and Kilmore that would have their grazing hinterlands severely impacted upon by proposed Alternative Route 1. These impacts would be avoided by the 2006 EPR. A tillage farm will be impacted upon by Alternative Route 2 more severely than it was by the 2006 EPR in the townland of Caherlclogh where the proposed alteration swings south eastwards to rejoin the 2006 EPR.

Comparing the two alternative route options with the 2006 EPR, both show benefits to some farms along the corridors with further farms being severed that would otherwise be avoided. The difference between the two alternatives however, in terms of overall impacts, is that the proposed benefits of Alternative Route 2 outweigh the negatives, especially as it reduces the overall impacts on a stud farm.

In conclusion, Alternative Route 2 would be the most preferred option of the three possible options as it slightly mitigates the overall negative impacts on agriculture. Alternative Route 1 is the least preferred option in this area.

4.2 Air Quality

This section describes the assessment of the potential air quality impacts of the three route corridors. The assessment was undertaken by staff in Tramore House RDO, and the full report is attached in Appendix A.2.1. It concludes Alternative Route 2 is the most favourable route option in relation to its potential impact on ambient air quality. Alternative Route 1 and the 2006 EPR are ranked equal second.

In accordance with the National Roads Authority document “Guidelines for the Treatment of Air Quality during the Planning and Construction of National Road Schemes”, the primary aspects of the assessment carried out relate to existing ambient air quality, exposure of the population to NO_2 and PM_{10} and the relative changes in concentration of these pollutants, and proximity of sensitive locations.

All route options are situated in an Air Quality Zone D which comprises rural Ireland, in general, and, in particular, all towns with a population of less than 15,000. The primary source of air pollution in the area is from traffic and from Clonmel town to the south. Using EPA monitoring data, the opening year ambient levels of NO_2, NO_x and PM_{10} at locations 200m from the existing N24, within the study area and close to the existing N24 were conservatively estimated. All were significantly less than the limiting values. Given that pollution from traffic increases at lower speeds and during congested traffic conditions, the proposed improvements to the infrastructure are likely to reduce the overall level of air pollution. In addition, the number of sensitive receptors

impacted by the proposed route corridors is significantly less than the number of receptors currently impacted along the existing route.

There are no specific sensitive ecosystems within the study area to be considered. In addition, traffic volumes are the same for all three route options. This means that impacts relating to local air quality changes depend entirely on the number of properties that will experience the change. As there are no properties within 10m of any of the route options, again this criterion is not relevant. For information purposes, the concentrations of NO_2, NO_x and PM_{10} were calculated for a worst case scenario of a sensitive receptor located at a distance of 5m from the carriageway. Results of this analysis yielded concentrations for all pollutants that are significantly lower than the limiting values.

The remaining criterion to be assessed in accordance with NRA guidelines is the Index of Overall Change in Exposure. This can be used as a measure of the effect of the routes on people. A corridor extending 50m from the carriageway is generally used for this analysis. However, as there are no properties within 50m of either Alternative Route 1 or Alternative Route 2, the corridor to be analysed was increased to 100m. Within this corridor, the Indices calculated for each of the options are given in Table 3.

		Emerging Preferred Route	Alternative Route 1	Alternative Route 2
Estimated AADT		**10,788**		
No. of Properties	**0-50m**	1	0	0
	50-100m	5	6	4
Length (km)		8.2	8.45	8.48
Index of Overall Change in Exposure to NO_x		**15,365.03**	**15,365.03**	**10,243.35**
Index of Overall Change in Exposure to PM_{10}		**461.41**	**461.41**	**307.61**
RANK		**2**	**2**	**1**

Table 3: Indices of Overall Change in Exposure

These results show that for both critical pollutants, Alternative Route 2 has the lowest Indices of Overall Change in Exposure, while the 2006 EPR and Alternative Route 1 have equally higher indices.

The Indices of Overall Change in Exposure are used as the primary basis for selecting a preferred route option as they indicate the increase in air pollution impacting sensitive receptors due to the various route options. In addition the number of sensitive receptors impacted by the route options was taken into account. The results show that, in relation to their potential impact on ambient air quality, Alternative Route 2 is the least negative route option. Both the 2006 EPR and

Alternative Route 1 obtained the same Index of Overall Change in Exposure, and are considered to be comparable in terms of impact on air quality.

4.3 Archaeology & Cultural Heritage

This section summarises the potential impacts of the three route corridors on archaeological and cultural heritage, and outlines the comparative assessment of the routes as examined by John Cronin Associates. The consultant's full route comparison report, complied as part of this assessment, is attached in Appendix A.3.1.

The assessment was carried out in the same manner as the original Route Selection study with information gathered from a wide range of sources including Record of Monuments and Places (RMP), the Sites and Monuments Record (SMR) of County Tipperary, various editions of Ordinance Survey Maps, archive files of the DoEHLG, N24 Clonmel Bypass Constraints Study Report etc.

The study identified three recorded archaeological sites (RMP No.'s TI076:043, TI077:028 and TI077:031) within 100m of the routes. These RMP's are indirectly impacted, with the 2006 EPR within 100m of TI076:043 while both Alternative Routes 1 and 2 are within 100m of all three. There are no identified registered monuments, sites in ownership or guardianship, preservation orders, or protected structures, within the study area. There are a relatively large number of cultural heritage features within the study area nonetheless, with varying levels of influence on the different route options. In total, there are 12, 20 and 19 identified cultural heritage features within the corridors of the Emerging Preferred, Alternative 1 and Alternative 2 routes respectively. Table 4 summarises the information relating to the features present as compiled for the archaeological route comparison report.

	Emerging Preferred Route	**Alternative Route 1**	**Alternative Route 2**
Total Number of Cultural Heritage Constraints within corridor	12	20	19
No. of RMP's within 100m	1	3	3
No. of RMP's Directly Impacted	0	0	0
No. of features fully or partially directly impacted by route	4 (2 moderate, 2 slight)	6 (1 moderate, 5 slight)	3 (1 moderate, 2 slight)
Overall impact rating	**1**	**3**	**2**

Table 4: Summary of Archaeological Assessment

The report concludes that from the perspective of minimising potential impacts on cultural heritage resources and the level of direct physical impact on these features, it is considered that the Emerging Preferred Route has the **highest merit**, with Alternate Route Option 2 being **less preferred,** followed by Alternate Route Option 1 as being **least preferred**.

It is noted in the report that whilst the three *recorded* archaeological sites are indirectly impacted, it is possible that further archaeological sites still remain undetected just below the present ground surface. For this reason a further geophysical survey was undertaken to investigate the nature and extent of possible archaeological remains in the vicinity of recorded monuments. This survey was carried out by J. M. Leigh Surveys and the report is attached in Appendix A.3.2.

Four areas were identified for geophysical survey

- a church and graveyard site (RMP No. TI076:043) at Newchapel corresponding with survey location GS-1
- an enclosure site (RMP No. TI077:028) at Ballyvaheen corresponding with survey location GS-2
- an enclosure site (TI077:047) at Ballyvaheen, 170m south of GS-2, corresponding with survey location GS-3
- an enclosure site (TI077:070) at Temple-etney, corresponding with survey location GS-4

Locations GS-1 and GS-4 are common to all three routes so results have a neutral impact on this comparison. Location GS-2 is partially within the corridors of Alternative Route 1 and Alternative Route 2 and location GS-3 is partially within the 2006 EPR corridor.

The enclosure site TI077:028 was successfully identified in area GS-2. To the north of the enclosure site in areas GS-2A and GS-2B linear responses may represent former field divisions, but a cluster of sub-circular responses may represent a small enclosure. Alternative Routes 1 and 2 bound the northern periphery of areas GS-2A and GS-2B, and would directly impact on the potential small enclosure. Neither route directly impacts on the recorded enclosure TI077:028. The survey of Area GS-3 identified linear responses possibly representing former field divisions; no clear responses indicative of archaeological activity were interpreted. The 2006 EPR corridor runs through this area.

The conclusions of this survey confirm the selection of the 2006 EPR as the preferred route option.

4.4 Biodiversity & Ecology

This section describes the assessment of the potential ecological impacts of the three route corridors with regard to impacts on flora, fauna and fisheries. ERM Ireland was commissioned in

June 2005 to carry out this assessment and the compiled report is attached in Appendix A.4. The assessment was carried out in accordance with the NRA Guidelines for Assessment of Ecological Impacts of National Road Schemes, 2004. The study area assessed for the purposes of this comparison study does not encroach upon the Lower River Suir cSAC along the Anner River. This site is located over 1km to the east of the study area, and all three route options being assessed here will entail the same crossing point, design and impacts. Therefore, for the purposes of this comparative assessment the three routes being compared are considered to have no direct impact on the cSAC. The assessment of route option impacts on the cSAC is detailed in the original Route Selection Report.

The land crossed by the route options is primarily agricultural pastureland, with some areas of tillage and arable land. Field systems are extensive and bounded by mature hedgerows and / or treelines. There are a total of four Areas of Ecological Constraint (ACE's) within the study area.

The areas are:

- Freshwater pond at Orchardstown
- Feeder Stream of River Brackford and associated riparian habitat ('Halfpenny Wood) at Orchardstown
- Calcareous spring in 'Halfpenny Wood' to north and close to stream crossing (Halfpenny Bridge) at Orchardstown
- Mature woodland along dismantled railway line at Moanroe

These features are all located between chainages 5000 and 8000 of the 2006 EPR i.e. within the section of the study area where all three routes differ. Consequently, they are potentially impacted upon differently by each route.

The freshwater pond is a habitat supporting smooth newts and snipe, both of which are protected species in Ireland. As a result, the pond is considered to be of moderate ecological value and locally important. In terms of its specific location, the pond is within 30m of the 2006 EPR at chainage 5200 and is therefore potentially impacted by it. Alternative Routes 1 and 2 are more than 280m to the north of the pond however and will not adversely affect it.

The stream is a depositing / lowland river and feeds into the River Brackford which is a known salmonid river. Furthermore, the stream may form a substantial part of the food supply for downstream fisheries and also support a variety of aquatic fauna. The watercourse and associated riparian vegetation is therefore considered to be of high ecological value and locally important. It crosses the 2006 EPR at the location of an existing local road crossing (Halfpenny Bridge) and also within the well established wooded riparian zone. Both Alternative Route 1 and Alternative Route 2 cross the stream at the same location, 50m to the north of the riparian woodland. As the 2006 EPR directly impacts on the wooded riparian zone and may require the

demolition of an existing river crossing it is considered to have a more negative adverse impact than the two alternative routes.

Spring habitats are becoming increasingly rare in Ireland and for this reason it is deemed to be of moderate ecological value and locally important. The calcareous spring identified is located to the north of the 2006 EPR and to the south of Alternative Routes 1 and 2. None of the routes impact directly on the spring, and therefore all three are considered to have comparable impacts.

The woodland area along the dismantled railway is crossed only by Alternative Route 1 at chainage 8150. It is considered to be of high ecological importance due to the woodlands it is bounded by. These woodlands have potential as bat roosts and embankments associated with railways such as this are ideal locations for badger setts. The 2006 EPR and Alternative Route 2 have no impact on this woodland.

The 2006 EPR has a potential impact on 2 of the four ecological areas identified above, and has a direct impact on the wooded riparian zone and existing stream crossing. Alternative Route 1 has a direct impact on woodland area along the dismantled railway, a site considered to be of high ecological importance. Alternative Route 2 has no direct impact on any of the 4 sites identified above. Therefore Alternative 2 is the preferred route in terms of ecology, and the 2006 EPR is the least preferred route.

4.5 Geology & Hydrogeology

The entire lengths of all three route options are within an aquifer area classified as 'Regionally Important'. However, none of the routes impact on the catchment areas of the Glenpatrick or Bulmers wells. Figures A.5.1 to A.5.3 in Appendix A.5 indicate areas of aquifer vulnerability. The three routes have been examined with regard to their interface with the different levels of aquifer vulnerability to estimate relative risk factors for each of the routes. The four levels of risk are extreme, high, moderate and low, and these have been given risk ratings from 4 to 1.

The lengths of each route within each risk level have been identified and a corresponding risk rating calculated. This information is given in Table 5 below. For the different levels of vulnerability, the likely areas of cut within all three routes have been identified to refine the estimated relative risk factors and these results are presented in Table 6 below.

In conclusion, the recommended preferred route option is Alternative Route 2, as preliminary analysis has shown it to have the least risk to the underlying Regionally Important aquifer. Similarly, the Emerging Preferred Route is the least preferred route.

		Overall Length	Risk Rating Factor	Risk Scoring	Potential Risk Rating
Emerging Preferred Route	Extreme	1.9km	4	7.6	20.2
	High	2.2km	3	6.6	
	Moderate	2.0km	2	4.0	
	Low	2.0km	1	2.0	
Alternative Route 1	Extreme	1.0km	4	4.0	18.2
	High	1.9km	3	5.7	
	Moderate	3.0km	2	6.0	
	Low	2.5km	1	2.5	
Alternative Route 2	Extreme	1.0km	4	4.0	18.6
	High	2.4km	3	7.2	
	Moderate	2.7km	2	5.4	
	Low	2.0km	1	2.0	

Table 5: Summary of Overall Aquifer Vulnerability Risk Assessment

		Overall Length in Cut	Risk Rating Factor	Risk Scoring	Potential Risk Rating
Emerging Preferred Route	Extreme	0.9km	4	3.6	11.2
	High	1.3km	3	3.9	
	Moderate	1.3km	2	2.6	
	Low	1.1km	1	1.1	
Alternative Route 1	Extreme	0.6km	4	2.4	10.5
	High	1.4km	3	4.2	
	Moderate	1.3km	2	2.6	
	Low	1.3km	1	1.3	
Alternative Route 2	Extreme	0.4km	4	1.6	9.6
	High	1.7km	3	5.1	
	Moderate	0.6km	2	1.2	
	Low	1.7km	1	1.7	

Table 6: Summary of Overall Aquifer Vulnerability Risk Assessment for Cut Areas

4.6 Landscape & Visual Impact

The assessment of the route options with regard to Landscape and Visual Impact is summarised in this section. MosArt was commissioned in 2006 to carry out a comparative assessment of the emerging preferred route option with each of the two new alternatives. The report on this is summarised below and attached in Appendix A.6. The report identified Alternative Route 2 as the preferred route for the scheme in terms of Landscape and Visual Impact.

The landscape through which the three route options pass is gently undulating and heavily vegetated with mature hedgerows and many blocks and belts of woodland. This means that the proposed routes are unlikely to be particularly exposed and are not expected to be significantly visually damaging in the study area. In this regard, the assessment takes into account the manner in which each of the routes traverses the landscape and the effects they would have from

a variety of view points, e.g. clusters of residential properties in the area, areas in and around Clonmel town centre, and elevated ground on the southern side of the Suir Valley. There would be no view of the routes from the two latter viewing areas and overall, there would no difference between the route options in terms of their visual impacts from these points. The most significant effects therefore are on the clusters of residential properties within the study area. The 2006 EPR is the only route with a property within 50m of the carriageway edge and in addition this property is at grade. Alternative Route 1 has the greatest total number of properties within 300m of the carriageway, with a significant proportion of these being either at grade or in areas of embankment which, consequently, are impacted upon more negatively by the route. For this reason, Alternative Route 1 is the least favourable route option. Alternative Route 2 has the fewest number of properties within 300m of its carriageway and also a smaller number of properties negatively impacted upon. As a result it is the most preferred option.

Factors like signage, lighting and noise barriers would be similar for all routes and are therefore not evaluated for each route separately. During construction the primary elements which have potential for negative impacts are removal of existing vegetation, planting of mitigation vegetation, general construction disturbance and night time lighting effects. These are considered short term negative impacts. During operation of the new routes, the factors with possible negative impacts are the presence of significant elevated structures such as earth retaining walls and bridges, significant road cutting slopes and embankments, noise barriers, gantry signage, moving traffic and night time lighting. These unmitigated effects would be medium term negative effects. Each of the routes would be screened by local undulations in most areas and where this does not occur, the remaining impacts would be minimal.

Following the implementation of appropriate mitigation measures such as landscape planting / screening and earthworks contouring and re-grading, the overall visual and landscape impacts due to the Alternative Route 2 are considered to be the least negative of the three available route options. For this reason it is selected as the preferred route in this category and Alternative Route 1 is the least preferred.

4.7 Noise

This section describes the assessment of the potential noise and vibration impacts of the three route corridors. The assessment was undertaken by staff in Tramore House RDO, and the full report is attached in Appendix A.7.1. It concludes Alternative Route 2 is the most favourable route option in relation to its potential impact on ambient noise and vibration levels. Alternative Route 1 is the least favoured option.

The assessment was undertaken in accordance with the NRA “Guidelines for the Treatment of Noise and Vibration in National Road Schemes”. These guidelines use the Potential Impact Rating (PIR) for each route as a means of comparison. The PIR is calculated by multiplying the number of properties within particular distances, up to 300m, from the mainline by a factor

depending on the distance from the mainline. The calculation of PIR's for the route options is illustrated in Table 7 and shows that Alternative Route 2 has the lowest nominal potential impact.

		Number of Properties	Rating Factor	Rating	Potential Impact Rating
Emerging Preferred Route	**0-50m**	1	4	4	**80**
	50-100m	5	3	15	
	100-200m	12	2	24	
	200-300m	37	1	37	
Alternative Route 1	**0-50m**	0	4	0	**91**
	50-100m	6	3	18	
	100-200m	15	2	30	
	200-300m	43	1	43	
Alternative Route 2	**0-50m**	0	4	0	**69**
	50-100m	4	3	12	
	100-200m	11	2	22	
	200-300m	35	1	35	

Table 7: Calculation of Potential Impact Rating

In addition to this, the noise levels at various distances from the carriageway edge were calculated in order to determine the level of mitigation required resulting from the change in the level of exposure to traffic noise of sensitive receptors. As the volume of traffic using the route will be the same regardless of the alignment chosen, this analysis will depend on the number of sensitive receptors impacted by each of the route options.

The results of this analysis found that mitigation may be required in respect of properties within 100m of the routes as within this distance noise levels would exceed the design goal noise levels specified by the NRA. Consequently, as Alternative Route 2 has no properties within 50m of the carriageway and also has the fewest number of properties within 100m, it would have the least negative impact on surrounding properties. Both the 2006 EPR and Alternative Route 1 have the same number of properties within 100m and while the 2006 EPR has 1 property within 50m, more of its' impacted properties are close to areas of cut than Alternative Route 1 which means that the level of mitigation required would be reduced. As a result, both the 2006 EPR and Alternative Route 1 are rated equally in terms of traffic noise level impacts.

With regard to vibration impacts, NRA guidelines state that unless there are special circumstances, these do not need to be considered at route selection stage. Furthermore, vibrations from road traffic are proven not to cause perceptible structural vibrations where the road surface is well maintained. Therefore, it is expected that all vibration impacts can be mitigated through regular maintenance of the road surface and in any case, will be equal for all route options under consideration.

In summary, the Potential Impact Ratings are used as the primary basis for selecting a preferred route under the heading of noise and vibration. This concludes that Alternative Route 2 is the most preferred route with Alternative Route 1 being the least preferred. This information is illustrated in Table 8.

Criterion		Emerging Preferred Route	Alternative Route 1	Alternative Route 2
Potential Impact Rating		80	91	69
No. of properties within 300m		55	64	50
No. of Properties for which mitigation may be required	0-50m	1	0	0
	50-100m	5	6	4
OVERALL PREFERRED ROUTE		**2**	**3**	**1**

Table 8: Summary of Comparative Noise Assessment

4.8 Hydrology & Drainage

The study area is contained within the catchment area of the River Suir. With a main channel length of 174km and an estimated catchment area of 3,484km^2, the River Suir drains the second largest land area in the Republic of Ireland. The lands contained within the study area for this assessment drain to the River Suir from 3rd and 4th order tributaries via the Anner River. The study area for this assessment does not encroach directly on the Anner or Moyle Rivers, and none of the route options require a crossing of these rivers within the study area being assessed.

Data from the OPW flood mapping website *(www.floodmaps.ie)* was used to assess each of the route corridors for possible flooding problems. The website records historical flood events and 'benefiting lands'. These are lands that would benefit from land drainage schemes, and indicate low-lying lands that are prone to flooding. No specific flood events or 'benefiting lands' are recorded with the study area currently being assessed, however it is noted that the eastern end of Alternative Route 1 at Kilmore runs adjacent to, and within 200m of, an identified flood plain of the Moyle River. The route would be on embankment through this area and there would be some potential for 'over the edge' drainage from the road to add to the flood loading. Appropriate attenuation measures should, however, be capable of mitigating this additional loading. There have been a number of flood events recorded downstream of the study area along the Anner River, into which the majority of the receiving watercourses in the study area flow. It is important that the drainage regime from the proposed road does not adversely contribute to existing flood characteristics in these areas.

Potential impacts on local hydrology to be considered include the following:

- Increased run-off to drainage paths and watercourses due to road drainage
- Potential increase in flood risk downstream due to increased run-off and discharge

- Potential increase in flood risk upstream due to impediment of overland or channel flows by road embankments or watercourse crossing points
- Potential impact on land drainage and improvement schemes
- Potential impact on known flooding areas

The study area is primarily drained by the Brackford stream and 1st and 2nd order tributaries of this stream. All of the route options shall utilise these watercourses to discharge surface water run-off from the road surface. Generally it is considered that the watercourse crossings and outfalls can be designed to have a neutral impact on the existing drainage characteristics both upstream and downstream of the crossing points. This shall be achieved by designing correctly sized culvert openings approved by the OPW, and by providing control measures for run-off discharge at outfall points by means of retention tanks or attenuation ponds. The Emerging Preferred Route crosses over an existing crossing of the Brackford stream, 'Halfpenny Bridge'. This bridge may have to be demolished and re-built for this route option, though such a decision would not be confirmed until the preliminary design is finalised. The conveyancing capacity and heritage value of the existing structure would be assessed before such a decision is made. The other two routes do not impact on this crossing.

All three routes are considered to present comparable potential impacts on receiving watercourses, watercourse crossings and existing land drainage. However Alternative Route 1 has potential to impact on an identified flood plain of the Moyle River at Kilmore. All three route options would require similar sensitive design and mitigation controls in order to ensure that the construction and operation of the road does not adversely impact on existing drainage regimes, particularly downstream of the study area. The 2006 EPR and Alternative Route 2 are considered comparable in terms of drainage and hydrology impacts, whereas Alternative Route 1 is less preferred due to potential impacts on flood plains of the Moyle River.

4.9 Socio-Economic

The purpose of the socio-economic assessment is to identify the potential impacts on the local communities associated with each route. In general, socio-economic impacts can be divided into four categories: journey length, community severance, amenity, and economic impacts.

Due to their close proximity, the three routes being assessed potentially impact on the same communities. A junction will be provided to accommodate the two regional roads crossed by all three route options. It is not anticipated that additional traffic will be generated on either of the regional roads as a result of this scheme and the junctions provided.

Within the study area, the route options cross a total of four local roads. One of these roads, in the Orchardstown area, is common to all three routes. A second road in the Orchardstown area is common to the 2006 EPR and Alternative Route 2. For these two local roads, which are crossed by more than one route, the proposed crossing points are all within 400 – 500 metres of each

other. The remaining two local roads, which are in the Carrigawillin and Kilmore areas, are crossed only by Alternative Route 1. As these roads are quite close together, it is proposed to permanently close one and divert traffic onto the other. This will require traffic currently using the local road to be closed to divert a distance of 1.71km to use the alternative local road.

The absence of local road closures and direct access to the proposed routes shall minimise changes in local journey patterns for the 2006 EPR an Alternative Route 2. With regard to Alternative Route 1, the diversion to be implemented as part of the single permanent road closure is not considered an excessive disruption and is not expected to significantly alter local journey patterns. With the exception of this road closure, all other local roads crossed by the routes will be realigned and an over/under bridge provided which means that there will be a minimal change in accesses in and around the area. In addition, farm accesses and underpasses will be provided as necessary for both routes and there are to be no direct accesses along the scheme.

Community severance due to a road development typically occurs whenever access to community facilities such as schools, post offices, shops, churches, hospitals, surgeries etc. is impeded by the physical obstacle of the road itself, due either to local road closures or increased traffic interface, or by an increase in journey times. Within the sections of the routes under assessment, there are no major community facilities and impact on nearby facilities is considered imperceptible. Some relief from existing severance to local journeys may be experienced by the removal of traffic from the existing N24 corridor. Public transport impacts will be the same regardless of the route chosen. The routes pass through an area which is predominantly agricultural and has a low population density.

The primary potential impact during construction will be due to temporary road closures and/or diversions during the construction of the local road bridges. These activities shall be managed to minimise local impacts. The potential impacts are considered to be equal for both the 2006 EPR and Alternative Route 2 as they impact on the same local roads and would require the same closure / diversion management plans. Due to the greater number of roads crossed, Alternative Route 1 will present additional but similar impacts.

In general, the proposed scheme will enhance prospects for regional and local economic development, stimulate increased tourist activity in the area and improve accessibility of recreational and cultural facilities. It is considered that all route options provide equal opportunities in this regard.

4.10 Conclusions

For the purposes of comparing three routes the rankings given to each of the routes in the individual environmental criteria are applied as a comparable score for the criteria. Therefore a ranking of 1st equates to a score of 1 etc. Therefore, the route that accumulates the lowest overall score is deemed to be the preferred route.

Table 9 summarises the comparative assessments carried out as part of this Route Comparison Report. From this information it is clear that Alternative Route 2 is the favoured option in the majority of the criteria assessed and is therefore selected as the preferred route in this section.

SUMMARY OF ENVIRONMENTAL ROUTE COMPARISON				
Section	**Criterion**	**Emerging Preferred Route (8.2km)**	**Alternative Route 1 (8.45km)**	**Alternative Route 2 (8.48km)**
4.1	Agriculture & Land Use	2	3	1
4.2	Air Quality	2	2	1
4.3	Archaeology & Cultural Heritage	1	3	2
4.4	Biodiversity & Ecology	3	2	1
4.5	Geology & Hydrogeology	3	2	1
4.6	Landscape & Visual Impact	2	3	1
4.7	Noise	2	3	1
4.8	Hydrology & Drainage	1	2	1
4.9	Socio-Economic	1	1	1
OVERALL SCORE		**17**	**21**	**10**
OVERALL RANKING		**2**	**3**	**1**

Table 9: Summary of Environmental Route Comparison

While the comparison demonstrates a clear preference for Alternative Route 2 over the 2006 Emerging Preferred Route, this new route impacts negatively on a number of environmental receptors that were unaffected by the 2006 EPR. This is particularly the case for a number of private domestic residences that were quite significantly removed from the 2006 EPR. South Tipperary County Council have received a large number of submissions from parties within the study area of this route comparison assessment. These submissions have been examined and generally express a particular preference for one of the above routes but individual preferences are quite evenly dispersed between the route options. In cognisance of the conclusion of the above assessment, and having given due consideration to the many points raised in submissions and consultations, it was decided to examine the viability of a further route option, an optimum hybrid of Alternative Route 2 and the Emerging Preferred Route, that may retain many of the identified benefits of moving the route but reduce many of the identified knock-on negative impacts.

The process for identifying and assessing such a route option is described in the section below.

5 CONSIDERATION OF AN OPTIMAL HYBRID ROUTE ALIGNMENT

5.1 Introduction

At this point in the study, is was observed that Alternative Route 1 was the least preferable route overall in terms of the environment and was the least preferred in the majority of the individual criteria. Therefore, it was omitted from consideration for the identification of an optimal route option. The study area was thus further reduced to encompass only the section of the corridor over which the 2006 EPR and Alternative Route 2 diverge and the specific local constraints within this reduced area were identified. The objective was to develop an optimal route option that avoided the identified constraints as much as possible while satisfying the required geometric design criteria. Figures 6, 7 and 8 below identify the 'Hybrid Route' that best satisfied these criteria. This Hybrid Route shall now be assessed in comparison with the 2006 EPR and Alternative Route 2 using the same methodology as applied above.

5.2 Engineering Assessment

The engineering assessment covers 11 criteria as follows:

Traffic
Junctions
Minor roads
Route lengths
Structures
Number of demolitions
Earthworks balance
Constructability
Services and Utilities
Stage F safety audit
Drainage

These criteria relate to major engineering differences between the route options. In the initial assessment, a preferred route was only identified in 4 of the 11 criteria and throughout the assessment, the 2006 EPR and Alternative Route 2 differed only in the areas of route lengths and earthworks balance. This reflects the strong similarities between the options, despite the fact that Alternative Route 2 was chosen as being marginally more positive overall.

Given that the Hybrid Route is a derivative of the 2006 EPR and Alternative Route 2, and that the 3 route options only differ over an area of only 4 km in length, it is clear that these similarities are present between all three options and that a full detailed engineering analysis would not prove useful. Consequently, the assessment has been carried out in a manner that has avoided repetition and yielded useful results.

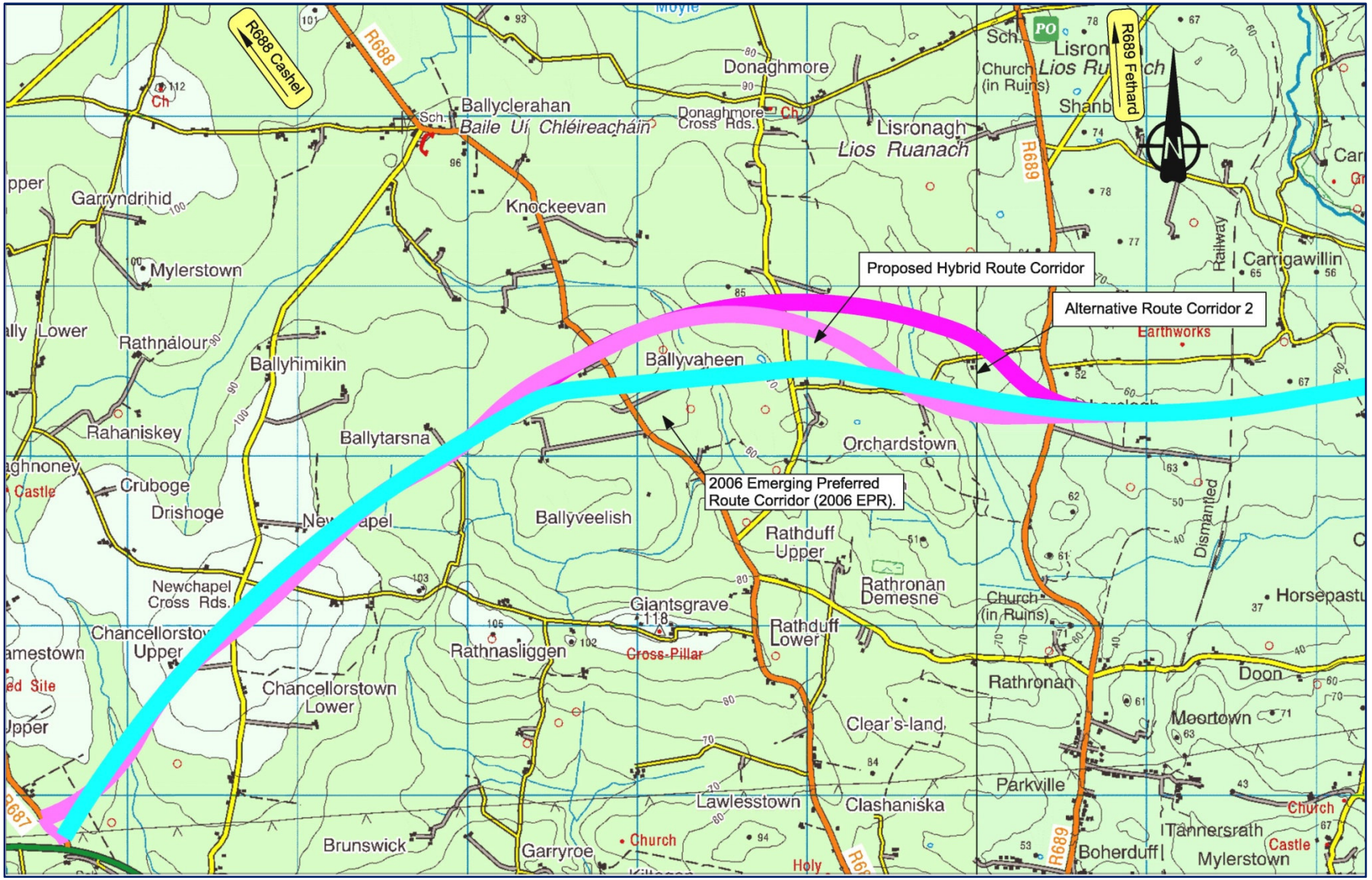

Figure 6: Hybrid Route Layout

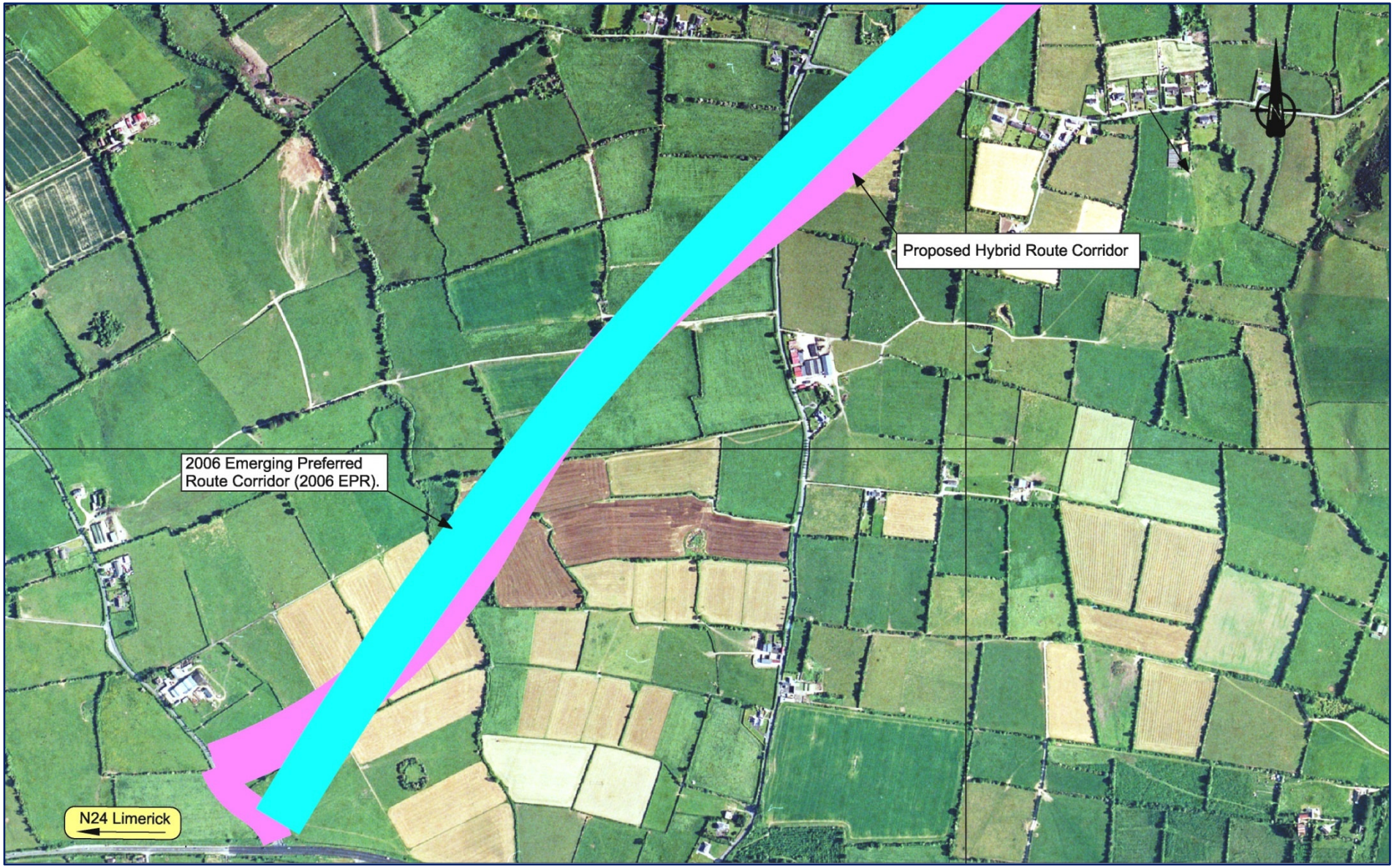

Figure 7: Hybrid Route Alignment (1 of 3)

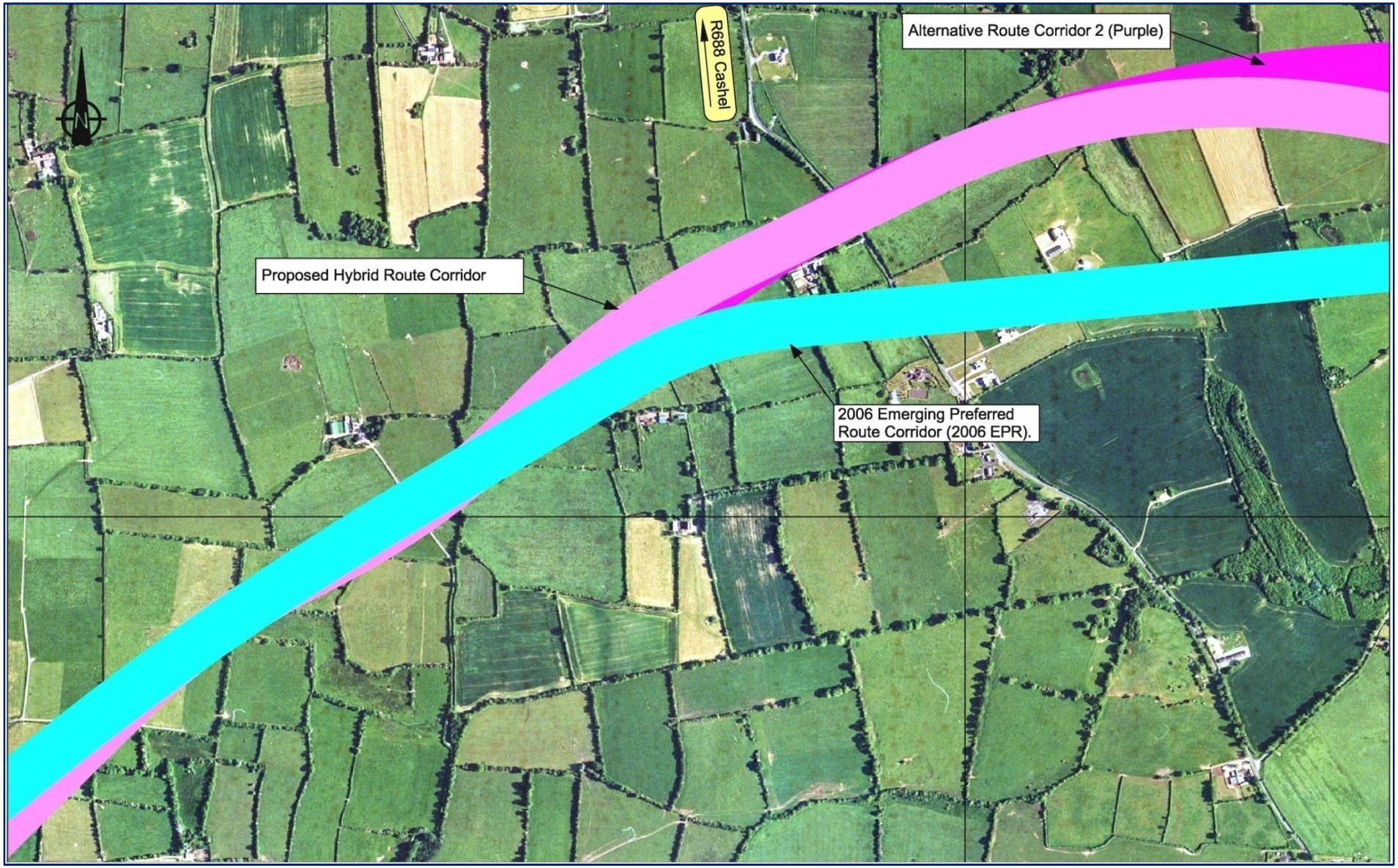

Figure 8: Hybrid Route Alignment (2 of 3)

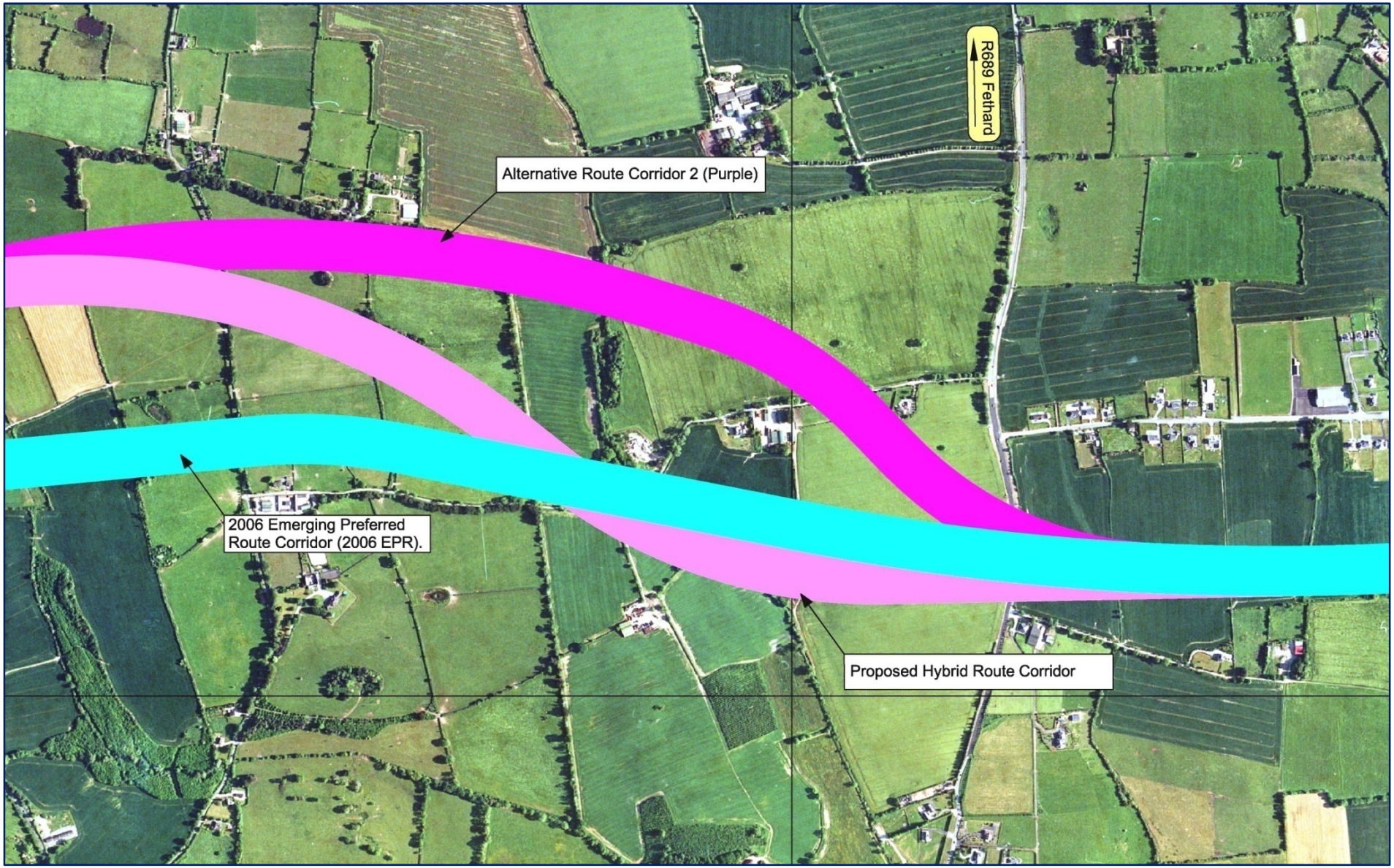

Figure 9: Hybrid Route Alignment (3 of 3)

The strategies employed for traffic, junctions, minor roads, structures, demolitions, constructability, services and utilities, stage F safety audit and drainage will be the same for all three options.

In terms of the lengths of the routes and the earthworks balances, Tables 10 and 11 below summarise the necessary information.

	Emerging Preferred Route	Alternative Route 2	Hybrid Route
Total Scheme Length	8.20km	8.48km	8.45km
Side Roads	2.05km	2km	2km

Table 10: Route Lengths

	Emerging Preferred Route	Alternative Route 2	Hybrid Route
Approx. Volume of Cut	1,555,000 m^3	1,540,000 m^3	1,470,000 m^3
Approx. Volume of Fill	1,160,000 m^3	1,270,000 m^3	1,405,000 m^3
Approx. Additional Material Required	0 m^3	0 m^3	82,000 m^3
Approx. Volume of unsuitable material to be disposed	155,000 m^3	155,000 m^3	147,000 m^3
Approx. Volume of excess material to be disposed	240,000 m^3	115,000 m^3	0 m^3
Ratio of Cut to Fill	1.35	1.21	1.05

Table 11: Earthworks Balance

The more significant of these criteria is the earthworks balance over the whole of the route. Table 11 shows that the earthworks for the new Hybrid route is far more balanced than that for the 2006 EPR or Alternative Route 2.

In summary, this information illustrates that while all route options are quite similar in the area of engineering; the Hybrid Route is marginally more favourable and can be selected as the preferred route in this section.

5.3 Environmental Assessment

This section assesses and compares the environmental impacts of the route options using the same criteria as applied in the previous chapter. Due to its close proximity to the previously assessed routes, the new 'hybrid route' generally impacts on the same environmental receptors and constraints as previously identified and assessed. This section therefore compares the environmental impacts of the 'hybrid route' with the previously identified impacts of the 'Emerging Preferred Route' and 'Alternative Route 2'.

The following is a summary of the assessment carried out for each of the environmental criteria.

5.3.1 Agriculture & Land Use

The Hybrid Route impacts on the same farm holdings as Alternative Route 2 which was previously identified as the preferred in terms of agricultural impacts. The impacts on farm holdings in the western half of the reduced study area are considered to be the same as for Alternative Route 2. The Hybrid Route loses some of the benefits that Alternative Route 2 imparts on the Stud Farm enterprise as it causes some severance of the holding whereas Alternative Route 2 ran quite close to the northern boundary, thus minimising severance. The Hybrid Route does however reduce the scale of severance on this holding when compared to the 2006 EPR and moves the route significantly further away from the stable yard. The Hybrid Route also increases impacts on the neighbouring farm holding in Orchardstown East, when compared to Alternative Route 2. The Hybrid Route severs the farm in a similar manner to the 2006 EPR, whereas Alternative Route 2 runs along the northern boundary of the holding. The Hybrid Route therefore is considered to have a greater potential negative impact than Alternative Route 2, but is preferred over the 2006 EPR. Therefore, Alternative Route 2 is the most preferred route under this criterion with the Hybrid Route being second most preferred.

5.3.2 Air Quality

An air quality assessment was undertaken for the three routes using the same methodology as described in section 4.2 above. (See Appendix A.2.2.) The assessment was undertaken for the extent of the scheme corridor along which the three routes diverge. Again, a corridor extending 50m from the relevant carriageway is generally used for this analysis. However, as there are no properties within 50m of either Alternative Route 2 or the Hybrid Route, the corridor to be analysed was increased to 100m. Within this corridor, the Indices calculated for each of the options are given in Table 12 below.

The Hybrid Route corridor has the lowest exposure index, and therefore the lowest potential impact on air quality. Therefore it is considered the preferred route in terms of air quality, and the routes are ranked in the following order: 1st Hybrid Route, 2nd Alternative Route 2, 3rd 2006 EPR.

		Emerging Preferred Route	Alternative Route 2	Hybrid Route
AADT		**10,788**		
No. of Properties	**0-50m**	1	0	0
	50-100m	5	5	3
Length (km)		8.2	8.48	8.45
Index of Overall Change in Exposure to NO_x		**15,365.03**	**12,804.19**	**7,682.52**
Index of Overall Change in Exposure to PM_{10}		**461.41**	**384.51**	**230.7**
RANK		**3**	**2**	**1**

Table 12: Indices of Overall Change in Exposure

5.3.3 Archaeology & Cultural Heritage

The information gathered on archaeological and cultural heritage sites from the report described in section 4.3 above was utilised to assess the potential impacts of the hybrid route in comparison to the Emerging Preferred Route and Alternative Route 2. The proposed hybrid route was superimposed on mapping previously used to identify archaeological and cultural heritage site locations impacted by the other route options. The hybrid route was therefore assessed using a similar methodology to that previously adopted and described in section 4.3 above.

The study identified three recorded archaeological sites (RMP No.'s TI076:043, TI077:028 and TI077:031) within 100m of the original routes and noted that these RMP's were indirectly impacted. The 2006 EPR was noted to be within 100m of TI076:043 while both Alternative Routes 1 and 2 are within 100m of all three. It is now noted that the hybrid route is within 100m of two of these sites (TI076:043 and TI077:028). As noted in section 4.3, there are no identified registered monuments, sites in ownership or guardianship, preservation orders, or protected structures, within the study area. A relatively large number of cultural heritage features were identified within the study area, and in particular there were 12, 20 and 19 potential sites identified within the corridors of the Emerging Preferred, Alternative 1 and Alternative 2 routes respectively. 18 of these sites are located within the corridor of the proposed hybrid route. Table 13 below summarises and compares the information relating to the features present as relevant to the particular route corridors.

From this assessment it is concluded that from the perspective of minimising potential impacts on archaeological and cultural heritage resources and the level of direct physical impact on these features, it is considered that the Emerging Preferred Route has the **highest merit**, with the hybrid route being the second most preferred**,** followed by Alternate Route Option 2.

	Emerging Preferred Route	Alternative Route 2	Hybrid Route
Total Number of Cultural Heritage Constraints within corridor	12	19	18
No. of RMP's within 100m	1	3	2
No. of RMP's Directly Impacted	0	0	0
No. of features fully or partially directly impacted by route	4 (2 moderate, 2 slight)	3 (1 moderate, 2 slight)	3 (1 moderate, 2 slight)
Overall impact rating	**1**	**3**	**2**

Table 13: Summary of Archaeological Assessment

The hybrid route was also assessed with regard to the geophysical survey undertaken to investigate the nature and extent of possible archaeological remains in the vicinity of recorded monuments. This survey was carried out by J. M. Leigh Surveys, and is described in section 4.4 above.

Survey Locations GS-2 and GS-3 in the townland of Ballyvaheen are particularly relevant to the current assessment. In this area, the hybrid route corridor runs in close proximity to the corridors of Alternative Route 1 and Alternative Route 2. These three corridors bound the northern periphery of GS-2 and would directly impact on the potential small enclosure identified there. However none of these routes directly impacts on the recorded enclosure TI077:028. The 2006 EPR corridor runs partially through the survey area GS-3. The survey of Area GS-3 identified linear responses possibly representing former field divisions; no clear responses indicative of archaeological activity were interpreted.

The conclusions of this survey confirm the selection of the 2006 EPR as the preferred route option

5.3.4 Biodiversity & Ecology

Section 4.4 identified Alternative Route 2 as the preferred route in terms of Ecology & Biodiversity, as it was considered to have no direct impact on the 4 main ecological sites identified within the study area. The Hybrid Route runs close to two of these sites, the riparian woodland habitat at 'Halfpenny Wood' and the existing stream crossing at 'Halfpenny Bridge', but avoids the direct impact that the 2006 EPR imposes on the sites. Nevertheless, due to its closer proximity to these sites than Alternative Route 2, it is considered to have a marginally higher potential impact and is therefore ranked lower than this route, but higher than the 2006 EPR. The routes are ranked as follows: 1st Alternative Route 2, 2nd Hybrid Route, 3rd 2006 EPR.

5.3.5 Geology & Hydrogeology

Section 4.5 assessed route options in terms of their interface with the underlying 'Regionally Important' aquifer with particular reference to the different levels of aquifer vulnerability, in order to estimate relative risk factors for each of the routes. The four levels of risk are extreme, high, moderate and low, and these have been given risk ratings from 4 to 1. The lengths of each route within each risk level were identified and a corresponding risk rating calculated. For the different levels of vulnerability, the likely areas of cut within all three routes were identified to refine the estimated relative risk factors for each of the routes. The hybrid route has been assessed on the same basis to make a comparison with the 2006 EPR and Alternative Route 2. The results of the comparative assessment are summarised below.

		Overall Length in Cut	Risk Rating Factor	Risk Scoring	Potential Risk Rating
Emerging Preferred Route	**Extreme**	0.9km	4	3.6	**11.2**
	High	1.3km	3	3.9	
	Moderate	1.3km	2	2.6	
	Low	1.1km	1	1.1	
Alternative Route 2	**Extreme**	0.4km	4	1.6	**9.6**
	High	1.7km	3	5.1	
	Moderate	0.6km	2	1.2	
	Low	1.7km	1	1.7	
Hybrid Route	**Extreme**	0.2km	4	0.8	**8.5**
	High	1.2km	3	3.6	
	Moderate	1.6km	2	3.2	
	Low	0.9km	1	0.9	

Table 14: Summary of Overall Aquifer Vulnerability Risk Assessment for Cut Areas

The Hybrid Route therefore is shown to have the least risk to the underlying Regionally Important aquifer, marginally lower than Alternative Route 2.

5.3.6 Landscape & Visual Impact

The landscape and visual assessment as summarised in section 4.6 above concluded that due to the gently undulating topography and heavily vegetated, mature belts of woodland through which the routes pass, they are unlikely to be particularly exposed and are not expected to be visually damaging in the overall study area. It also concluded that the three routes were likely to have very similar impacts in this respect. Therefore, the most significant differentiating effects were identified as the potential impacts on residential properties close to each of the routes. In this respect, the number of properties within 300m of each of the routes was used to evaluate the potential landscape and visual impacts. The Hybrid route has the least number of properties in its proximity, followed by Alternative Route 2 and the 2006 EPR. Consequently, the Hybrid Route is considered to be the most preferred route in this area with the 2006 EPR being the least.

5.3.7 Noise & Vibration

A noise assessment was undertaken for the three routes using the same methodology as described in section 4.7 above. (See Appendix A.7.2) The assessment was undertaken for the extent of the scheme corridor along which the three routes diverge. The calculation of PIR's for the route options is illustrated in Table 15 below.

		Number of Properties	Rating Factor	Rating	Potential Impact Rating
Emerging Preferred Route	**0-50m**	1	4	4	**80**
	50-100m	5	3	15	
	100-200m	12	2	24	
	200-300m	37	1	37	
Alternative Route 2	**0-50m**	0	4	0	**69**
	50-100m	4	3	12	
	100-200m	11	2	22	
	200-300m	35	1	35	
Hybrid Route	**0-50m**	0	4	0	**62**
	50-100m	3	3	9	
	100-200m	10	2	20	
	200-300m	33	1	33	

Table 15: Calculation of Potential Impact Rating

As described in Section 4.7 above, the Potential Impact Ratings are used as the primary basis for selecting a preferred route under the heading of noise and vibration. This concludes that the Hybrid Route is the most preferred route with the 2006 EPR being the least preferred.

5.3.8 Hydrology & Drainage

Section 4.8 above compared the likely drainage and hydrology impacts of the 2006 EPR and Alternative Route 2 and concluded that they were comparable, and both were preferable over Alternative Route 1. The Hybrid Route has the same drainage characteristics of the two route options from which it was developed and is therefore considered to be comparable with both. Therefore all three options are ranked equally in terms of hydrology and drainage.

5.3.9 Socio-Economics

Section 4.9 above described the potential socio-economic impacts of the original three route options. Due to their close proximity, the three routes were considered to be very similar in terms of their potential impacts on journey length, community severance, amenity, and economic impacts. In general, the proposed scheme will enhance prospects for regional and local economic development, stimulate increased tourist activity in the area and improve accessibility of recreational and cultural facilities. It is considered that the three route options currently being

assessed offer equal opportunities in this regard. Therefore all three options are ranked equally in terms of socio-economics.

5.3.10 Conclusion

An overall assessment of environmental impacts of the route options is undertaken in Table 16 below in a similar manner to that used in Section 4.10 above. For completeness and full comparison, Alternative Route 1 is included using the same relative ranking to the 2006 EPR and Alternative Route 2 as identified in Table 9 above.

SUMMARY OF ENVIRONMENTAL ROUTE COMPARISON					
Sections	**Criterion**	**2006 EPR**	**Alternative Route 1**	**Alternative Route 2**	**Hybrid Route**
4.1/ 5.3.2	Agriculture & Land Use	3	4	1	2
4.2 5.3.3	Air Quality	3	3	2	1
4.3/ 5.3.4	Archaeology & Cultural Heritage	1	4	3	2
4.4/ 5.3.5	Biodiversity & Ecology	4	3	1	2
4.5/ 5.3.6	Geology & Hydrogeology	4	3	2	1
4.6/ 5.3.7	Landscape & Visual Impact	3	4	2	1
4.7/ 5.3.8	Noise	3	4	2	1
4.8/ 5.3.9	Hydrology & Drainage	1	4	1	1
4.9/ 4.3.10	Socio-Economic	1	1	1	1
OVERALL SCORE		**23**	**30**	**15**	**12**
OVERALL RANKING		**3**	**4**	**2**	**1**

Table 16: Summary of Environmental Route Comparison

From this information the Hybrid Route is shown to be the preferred route in terms of environment. The Hybrid Route is particularly preferable in air quality, noise and visual impacts, reflecting the lower number of residential properties in its proximity. In general, the Hybrid Route is considered

to optimise the benefits of the 2006 EPR and Alternative Route 2, while minimising the negative impacts of both.

5.4 Conclusions

This section has outlined the identification and assessment of an optimal route option, a 'Hybrid Route', based on the current most preferred route options, the 2006 EPR and Alternative Route 2. This new Hybrid Route retains many of the benefits of each of the route options while eliminating many of their disadvantages. This is illustrated through the engineering and environmental assessments carried out in both of which the Hybrid Route emerges as the most favourable option.

As a result of this information, the comparison of the 2006 EPR, Alternative Route 1 and Alternative Route 2 will continue in the following sections to include an assessment and comparison of the Hybrid Route.

6 ECONOMIC ASSESSMENT

6.1 Methodology

In accordance with the NRA Project Appraisal Guidelines, the economic impacts of a route are assessed on the basis of a comparison of the following aspects:

- Transport efficiency and effectiveness
- Other economic impacts
- Funding impacts

In the context of the current route comparison, the four routes will have much of the same advantages and disadvantages under the criteria of transport efficiency and effectiveness as all routes are significant improvements when compared with the existing route. In terms of journey times, all route options offer significant potential improvements. The 2006 EPR, due to its slightly shorter length, presents marginally greater time savings. Impacts on public transport will be the same regardless of the route chosen.

6.2 Non Monetised Impacts

The non monetised impacts cover the other economic impacts, mentioned above, on the region and indeed the country due to the scheme. These can be considered to be equal for the routes under assessment due to the similarities in the overall outcome as a scheme.

This scheme forms a vital part of the strategic western corridor linking Waterford and Limerick. Therefore many of the benefits arising from the successful upgrade of the entire route are dependent on the individual component schemes. The Clonmel Bypass section forms an essential part of the proposed strategic transport corridor. In this context the positive impacts of the scheme on the economy of a number of regions in the country are clear due to the higher standard of transport infrastructure and access being provided. However, in terms of choosing a preferred route, none of the options have any significant differentiating factors in this regard.

6.3 Monetised Impacts

Option Cost Estimates (OCE's) were compiled for each of the route options based on current approved NRA rates and contemporary rates. These OCE's are summarised in Table 17 below. From this it can be seen that Alternative Route 2 is the least expensive route option while Alternative Route 1 is the most expensive. The variances in OCE's reflect the differences in route lengths and alignments between the route options, which influence the quantity of land to be acquired, the number of structures required and the quantity of materials to be used.

OPTION COST ESTIMATES (€)				
Criterion	**2006 EPR**	**Alternative Route 1**	**Alternative Route 2**	**Hybrid Route**
CONSTRUCTION COSTS				
Site Clearance	€83,000	€84,000	€84,000	€84,000
Fencing	€2,764,000	€2,819,000	€2,569,000	€2,488,500
Drainage	€5,265,000	€5,346,000	€5,356,000	€5,346,000
Earthworks	€8,802,000	€11,217,000	€8,594,500	€9,028,000
Sub-base and Roadbase	€7,043,000	€7,152,000	€7,165,000	€7,152,000
Flexible surfacing	€3,913,000	€3,973,500	€3,981,000	€3,974,000
Traffic signs and Roadmarkings	€358,000	€363,500	€364,000	€363,500
Structures	€10,085,000	€9,580,000	€9,530,000	€10,080,000
Junctions	€1,500,000	€1,500,000	€1,500,000	€1,500,000
Preliminaries	€5,574,000	€5,885,000	€5,480,000	€5,602,000
Provisional Sum	€2,270,000	€2,396,000	€2,231,000	€2,281,000
CONSTRUCTION COST TOTAL (EXCL. V.A.T.)	**€47,657,000**	**€50,316,000**	**€46,854,500**	**€47,899,000**
V.A.T. (13.5%)	€6,434,000	€6,793,000	€6,325,000	€6,466,000
Local Authority Contingency	€8,654,000	€9,137,000	€8,509,000	€8,698,500
CONSTRUCTION COST TOTAL (INCL. V.A.T.)	**€62,745,000**	**€66,246,000**	**€61,688,500**	**€63,063,500**
NON CONSTRUCTION COSTS				
Supervision	€1,500,000	€1,500,000	€1,500,000	€1,500,000
Advance Works	€500,000	€500,000	€500,000	€500,000
Residual Network	€200,000	€200,000	€200,000	€200,000
Planning and Design (Incl. EIS)	€3,800,000	€3,800,000	€3,800,000	€3,800,000
Land and Property	€17,901,000	€18,177,000	€18,210,500	€18,177,000
Archaeology	€2,065,500	€2,097,500	€2,101,000	€2,097,500
NON CONSTRUCTION COSTS TOTAL	**€25,966,500**	**€26,274,500**	**€26,311,500**	**€26,274,500**
OVERALL SCHEME COST	**€88,711,500**	**€92,520,500**	**€88,000,000**	**€89,338,000**
COST PER KM	**€5,476,019**	**€5,624,347**	**€5,339,806**	**€5,430,881**

Table 17: Summary of Option Cost Estimates

6.4 Conclusion

Overall, the main basis for comparison of the two route options in terms of economy is the Option Cost Estimates and in this regard Alternative Route 2 presents the lowest costs. However the cost estimates for the 'Emerging Preferred Route', 'Alternative Route 2' and the 'Hybrid Route'

are within 2% of each other, reflecting the similarities between these routes. Given the preliminary stage of the development of the routes and the very close range of estimated costs between these three routes, they are considered to be of relatively equal benefit in terms of economy. 'Alternative Route 1' is considered to offer less attractive economic benefits in comparison to the other three route options.

7 SAFETY ASSESSMENT

Safety assessments are considered in terms of impacts on road accidents and road user security. All route options considered offer substantial potential reductions in total accidents and associated fatalities. In the eight year period from 1999 to 2006 there were a total of 27 reported injury accidents on the N24 within the current study area. These consisted of 3 no. fatal, 3 no. serious injury and 21 no. minor injury accidents. By averaging the AADT on this 10.5km stretch of existing road over these 8 years, the annual average accident rates per vehicle kilometre can be calculated. These rates can then be compared against published NRA accident rate data for both the entire N24 and all national routes. The NRA accident rates have been averaged from the data included in the annual publication of the 'Road Collision Facts' from 1998 to 2005. The annual average accident rate per million vehicle kilometres compare as follows:

	N24 Study Area[1]	Entire N24[2]	All National Routes[2]
All Injury Accidents	0.108	0.14	0.13
Fatalities	0.01	n/a	0.01

Table 18: Average Annual Accident rates per million vehicle kilometres

[1] Averaged from available accident data from 1999 to 2006

[2] Averaged from annual rates published in the NRA's 'Road Collision Facts' from 1998 to 2005

Therefore, it can be concluded that the section of the N24 within the study area has a similar accident rate than the national average for overall accidents and fatalities. The European Road Assessment Programme (EuroRAP) provides independent, consistent safety ratings of roads across borders. The section of N24 national route from Cahir to Carrick-on-Suir was identified in the EuroRAP mapping for the period 2002-2006 as having a 'Low - Medium' Risk.

Statistical evidence demonstrates that dual carriageways are safer than single carriageways. This fact has been taken into consideration in the selection of the road type for this scheme. It is considered that the development of any of the current route options will lead to reduced accidents when compared to current accident rates on the existing single carriageway.

When comparing the route options, there is no significant difference in terms of safety benefits. This is because all options will be designed and constructed to the same high standards, with the same junction strategy, and the traffic volumes and profiles using the route will be very similar regardless of the route chosen.

Pedestrians and cyclists shall not have dedicated access to, or facilities on the proposed dual carriageway scheme, but shall not be prohibited from using the route. All existing routes shall be retained to provide alternative, more suitable routes for such non-motorised users. If the proposed scheme proceeds, it is considered that the existing N24 route being bypassed should become more user friendly for pedestrians and cyclists due to the significant reduction in motorised traffic along that route. All route options are considered to offer equally positive impacts in this respect.

One of the key objectives of the proposed scheme is to improve the safety performance of the N24 National Primary route. All of the assessed routes are considered to be comparable in terms of their positive impact on the overall safety of the route. For this reason it is considered that all of the routes shall meet the key safety objectives of the scheme but none of the four can be identified as being clearly more preferable from the point of view of safety.

8 ACCESSIBILITY & SOCIAL INCLUSION

This section looks at the impacts of the route options on local communities, vulnerable groups and deprived geographical areas. In general it is considered that this scheme will have a positive impact on accessibility and social inclusion. The current N24 route within the study area mixes local traffic accessing Clonmel for local services, businesses, jobs, schools etc with longer distance N24 commuter traffic. This mix creates delays and congestion along the existing Clonmel Ring Road in peak hours and therefore impacts negatively on accessibility for local communities and road users. The significant growth of residential and industrial development on the outside periphery of the Ring Road adds substantially to the conflict between local traffic and through traffic. The removal of N24 through traffic from the Clonmel Ring Road will mitigate this conflict and provide opportunities for the further development of public transport and pedestrian/cyclist facilities along the Ring Road and within the town itself.

Existing local roads crossed by the scheme will be realigned over or under the mainline with access roads or underpasses being provided where farm severance arises. There are no direct accesses onto the scheme from local roads and therefore local access will not change.

This scheme shall contribute to the achievement of the above objectives and is considered to have a positive impact in terms of accessibility and social inclusion. Comparatively however, there are no differences between the route options under assessment.

9 INTEGRATION

In accordance with the NRA Project Appraisal Guidelines, the following areas were assessed under this criterion:

- Transport Integration

- Land Use Integration
- Geographical Integration
- Other Government Policy Integration

Transport integration aims to provide improved road linkages between key centres, improved connectivity between transport modes, improved public transport, and improved access to other key elements of transport infrastructure such as ports and airports. The proposed scheme, as part of an overall improvement of the N24 route will further integrate the N24 and N8 strategic routes, thereby improving access to the Dublin-Cork axis, as well as the Limerick-Waterford axis. The scheme is currently proposed as a Type 2 dual carriageway. This road cross section is consistent with that of adjacent proposed schemes and will provide continuity in road type. The strategy for route signing shall be integrated with other schemes in the region to provide clear and consistent directions to road users. The interfaces with adjacent schemes shall be designed, where practicable, to make the transition from one scheme to another as seamless as possible. The proposed scheme facilitates improved road based public transport by providing a faster and more reliable route for local and intercity journeys. The proposed scheme also improves access to key non-road transport hubs such as Shannon International Airport, Waterford Regional Airport, Rosslare Europort, Port of Waterford and Shannon Foynes Port.

The proposed scheme has been identified in the current South Tipperary County Development Plan (2009-2015) as a key road transport objective and identifies the protection of the proposed route corridor from development or interference as an imperative in order to further facilitate the development of the national road network in accordance with national policy. The Plan identifies the development of the scheme as being consistent with the promotion of the economic development of the county, the preservation and enhancement of the safety and level of service on the national road network in the county, and supportive of the overall land-use plans for the county. South Tipperary County Council in association with the South East Regional Authority has commissioned a report entitled the 'N24 Prioritisation Study' which confirmed the case for the improvement of the N24 corridor and recommended it prioritisation for construction in the NRA's post 2010 programme.

The proposed scheme will assist geographic integration by improving the link between Waterford and Limerick, both of which are identified in the National Spatial Strategy as gateway cities. The scheme is also consistent with the objectives of the current National Development Plan. A primary objective of the proposed upgrade of the N24 route is to facilitate improved access to, and between strategic locations in the south-east and mid-west regions including Shannon International and Waterford Regional Airport, Rosslare Europort, Port of Waterford, Shannon Foynes Port, and also to contribute to the improvement of inter-regional access between the Waterford City Gateway and the Limerick Shannon Gateway, and access to the county town of Clonmel.

This scheme is considered to have a positive impact in terms of integration. Comparatively however, there are no major differences between the route options in this respect.

10 PUBLIC CONSULTATION

10.1 Introduction

A public consultation exercise was held on the 18th and 19th October 2010. The purpose of the public consultation was to inform and update the public on the proposed amendments to the Emerging Preferred Route Corridor, and to seek their views and comments on them. A report on the public consultation process is included in Appendix B. The report describes the public consultation process, summarises the submissions received, present's responses to the submissions and on the basis of those responses, makes recommendations on the proposed amendments to the 2006 EPRC.

10.2 History of Scheme Public Consultations

Public consultations to date have been undertaken in accordance with the National Roads Authority's "Project Management Guidelines" These Guidelines outline a framework for the phased approach to the development and delivery of major national road schemes in Ireland and are structured with the aim of providing consistency of approach throughout the national road network. The public consultations held to date for this scheme are as follows:

- February 2005; First Public Consultation – Constraints Study Area
- February 2006; Second Public Consultation – Emerging Preferred Route Corridor
- October 2010; Third Public Consultation – Emerging Preferred Route Corridor

The first and second consultation exercises were undertaken in accordance with the contemporaneous NRA "Project Management Guidelines" (NRA PMG) published in 2000. In January 2010 the NRA PMG was revised and published as the "2010 Project Management Guidelines" (2010 PMG). These revised Guidelines removed the requirement to undertake a full public consultation on the 2006 EPRC, and replaced it with a public display of the 2006 EPRC to inform the public of the selected route corridor. Notwithstanding this, South Tipperary County Council proceeded with a full public consultation, and thus exceeded the current requirements of the 2010 PMG.

It is therefore considered that the public consultations for the scheme have been undertaken in accordance with the relevant Guidelines. It is also noted that the public consultation exercises as outlined in the Guidelines are not a statutory requirement but used to inform the public about the developing scheme.

10.3 Third Public Consultation – Emerging Preferred Route Corridor

The Third Public Consultation on the proposed amendments to the 2006 EPRC was held on the 19th October 2010 at the Band Hall, Clonmel and on the 20th October, 2010 at the Carraig Hotel, Carrick on Suir. South Tipperary County Council arranged for the consultation exercise to be advertised in advance in the local media. An advertisement was placed on the 14th October 2010 in the Nationalist newspaper.

The following public information was prepared and put on prominent display at both consultation venues;

- 2 no. large scale drawings showing the proposed amended 2006 EPRC and the original 2006 EPRC on Ordnance Survey background mapping with proposed junction locations and contiguous N24 major road schemes indicated.

- 2 no. large scale drawings showing the proposed amended 2006 EPRC and the original 2006 EPRC on aerial photography background mapping with proposed junction locations and contiguous N24 major road schemes indicated.

- Public Consultation Information Brochures (in both Irish and English languages) containing a synopsis of the need for the scheme, descriptions of the route selection process and the proposed 2006 EPRC, details of the procedure for submitting comments and further information on the likely future development of the scheme.

- Public Consultation Questionnaires (in both Irish and English languages) with accompanying prepaid envelopes. These Questionnaires provided an opportunity for members of the public to express their views regarding the proposed amendments to the 2006 EPRC.

Copies of the brochure and questionnaire were provided to each attendee at the consultation. All of the public information was subsequently made available for public viewing at County Hall in Clonmel. Staff representing the Client; South Tipperary County Council, and the designers; Tramore House Regional Design Office, were in attendance at the exhibition venue to explain the scheme and answer any questions from members of the public. Notes were taken where appropriate, and everyone was encouraged to fill in the questionnaire provided and return as soon as possible.

At both venues, attendees visiting the exhibition were invited to sign a visitor's book, to enable a record of the number of attendees to be maintained. 65 attendees were recorded in Clonmel on the 19th October and 128 attendees were recorded in Carrick on Suir on the 20th October. It should be noted that a public consultation on the N24 Carrick on Suir Bypass was held at both venues concurrently. It was generally noted that the vast majority of attendees on the second consultation day in Carrick on Suir were present to inform themselves about the N24 Carrick on Suir Bypass. A deadline of the 5th November 2010 was established for the return of completed

questionnaires or other submissions. In total 22 submissions were received in relation to the scheme. Any submissions received after the deadline were also accepted.

10.4 Submissions Received

The 22 submissions received have been broken down into specific criteria as specified below in order to present a more comprehensive overall picture of the feedback received from the consultation process. Appendix B provides a comprehensive report on each of the submissions received. The individual submissions are summarised to identify the main issues raised, and responses to these issues are given.

The types of holding represented by the submissions are outlined in Figure 1.

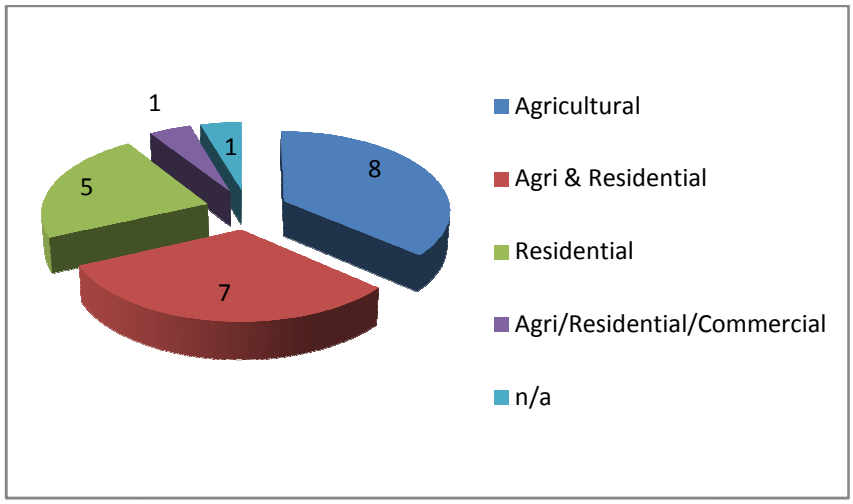

FIGURE 10: TYPE OF HOLDING SPECIFIED IN SUBMISSIONS

The submissions can be divided into the following broad geographic areas.

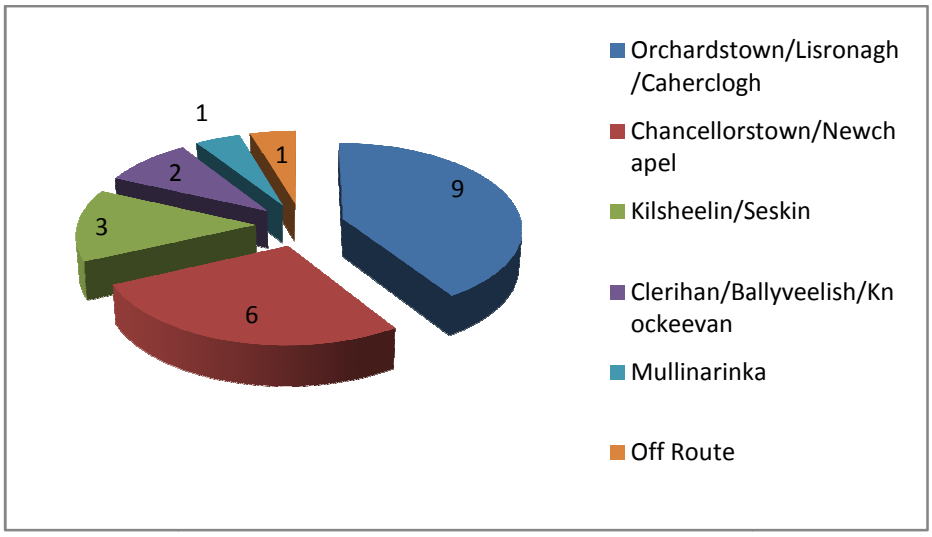

FIGURE 11: BROAD GEOGRAPHIC SPREAD OF SUBMISSIONS

The spread of issues raised in the individual submissions can be summarised into the following broad categories.

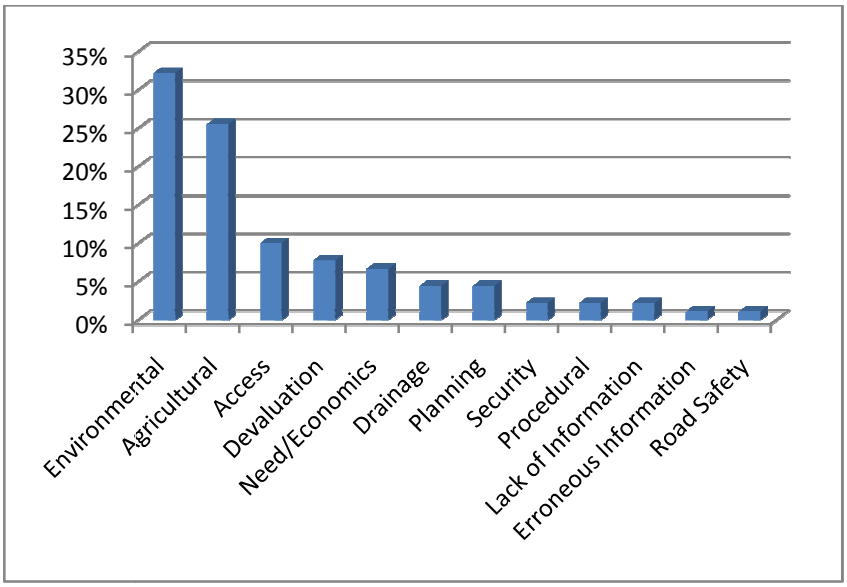

FIGURE 12: BROAD SUMMARY OF ISSUES RAISED

10.5 Conclusions & Recommendations

The public consultation was undertaken in accordance with the relevant NRA guidelines for national roads projects. The overall volume of submissions received was relatively low, probably reflective of the relatively localised nature of the proposed amendments to the emerging preferred route corridor. The geographic grouping of the submissions is also a fairly accurate reflection of the areas in which amendments are proposed. The relatively low volume of overall submissions does not in any way dilute the importance or significance of each individual submission. Each submission has been considered individually and on its own merits, and the submissions have also been considered collectively based on geographic location, and in the context of previous submissions made at the public consultation in 2006. The consideration of any possible changes to the preferred route corridor resulting from submissions are made in the context of the overall impact of the change, including the potential positive impact on the party making the submission, and any potential positive or negative impacts on third parties and other sensitive receptors. Some detailed issues included in submissions cannot be fully addressed until the design and environmental impact statement for the scheme is developed. These issues shall be considered further in the development of these future phases of the scheme.

Having considered all of the issues raised in the submissions, and reviewed the assessment works completed to date, no significant further alterations are recommended to the amended emerging preferred route corridor presented at the public consultation in October 2010. It is considered that the issues/comments received have either already been addressed in the studies undertaken as part of the route selection process, will be addressed as part of the further detailed

studies to be undertaken as part of the statutory EIS and CPO processes, or do not merit alterations to the route corridor. However, following consideration of submissions received in the Newchapel/Chancellorstown area, a marginal and localised alteration to the amended emerging preferred route corridor is proposed in this area. This proposed alteration has been developed in consideration of the overall impact of the change as well as the requirement to comply with the minimum geometric alignment criteria required for national primary routes. The alteration would move the corridor back towards the north-west in a localised area around Newchapel cross roads, thus reducing the significant impact on a dairy farm enterprise while preserving a protection zone around Newchapel graveyard. A sketch of the proposed revision is shown in the Appendix B, and would move the corridor back a maximum of approximately 50m to the north-west within the dairy farm and approximately 20m adjacent to the graveyard. The requirement for a continuous flowing geometric road alignment consequently pushes the corridor a maximum of approximately 40m in the opposite direction (to the south-east) as the corridor approaches Rathkeevin. It is considered that the marginal and localised nature of the corridor realignment will provide a disproportionately positive benefit to the holding in question while minimising any adverse impacts on neighbouring holdings, environmental receptors or Newchapel graveyard.

It is therefore recommended that the amended preferred route corridor presented at public consultation in October 2010 be progressed through the route selection process with the minor, localised alteration at Newchapel incorporated, as described above.

11 PROJECT APPRAISAL AND ROUTE SELECTION

11.1 Methodology

Project appraisals are required for all proposals that require public funding in order to ensure that such funds are allocated in an efficient and cost effective manner. The NRA Project Appraisal Guidelines outline the appraisal process and are consistent with the Department of Finance's guidelines.

Each scheme must be assessed against the government's five key criteria set out in the Department of Transport's *'Guidelines on Common Appraisal Framework for Transport Projects and Programmes'*. These criteria are as follows:-

- Environment
- Economy
- Safety
- Accessibility & Social Inclusion
- Integration

These criteria are discussed and assessed in detail in sections 4 to 9 above.

11.2 Project Appraisal Balance Sheets (PABS)

The Project Appraisal Balance Sheet (PABS) is the mechanism used to report on the respective impacts of the proposals under these five criteria. It contains a mixture of quantitative indicators and qualitative statements, and provides a concise summary of the impacts of the scheme. It then uses a scaling statement to rank the project for each of the five criteria in terms of impacts ranging from highly / moderately / slightly positive to neutral to highly / moderately / slightly negative.

11.3 PABS for Route Options

The PABS below for the route options are compiled from the findings of the respective assessments described in sections 4 to 9 above, and in accordance with the NRA Project Appraisal Guidelines.

PROJECT APPRAISAL BALANCE SHEET:- EMERGING PREFERRED ROUTE				
Criterion	***Element***	***Qualitative Statement***	***Quantitative statement***	***Scaling Statement***
Environment	***Agricultural***	Large number of land parcels impacted including a high level of good quality land parcels. Main land use affected is grassland. Moderate instance of major land severance and low instance of no land severance.	15 land holdings impacted, of which 14 are severed including significant severance to stud farm operation.	Moderately Negative
	Air Quality	Route is in Air Quality Zone D. Concentrations of NO_2, PM_{10} and NO_x will remain significantly below the limiting values for zone type. No sensitive ecosystems impacted.	Index of Overall Change in Exposure – 15,365 kg/km/yr NO_2 – 461 kg/km/yr PM_{10} measured for a corridor of 100m from the mainline.	Moderately Negative
	Archaeology	There are no identified registered monuments, sites in ownership or guardianship, preservation orders, or protected structures, within the study area. No RMP Sites directly impacted.	No RMP Sites directly impacted 1 RMP Site indirectly impacted. 12 other potential sites identified within corridor. 4 of these directly impacted (2 moderate, 2 slight)	Slightly Negative
	Biodiversity & Ecology	The land crossed by the route is primarily agricultural pastureland, with some areas of tillage and arable land. Field systems are extensive and bounded by mature hedgegrows and / or treelines.	The route has a direct impact on a woodland riparian zone and existing stream crossing, considered to be of high ecological value and locally important. In close proximity to a freshwater pond habitat of moderate ecological value and locally important.	Moderately Negative
	Geology & Hydrogeology	The route corridor is within an aquifer area classified as 'Regionally Important'. Route examined with	0.9km of cutting within aquifer area identified as extremely vulnerable. 1.3km of cutting within aquifer area	Moderately Negative

PROJECT APPRAISAL BALANCE SHEET:- EMERGING PREFERRED ROUTE				
Criterion	***Element***	***Qualitative Statement***	***Quantitative statement***	***Scaling Statement***
		regard to interface with identified and mapped levels of aquifer vulnerability to estimate relative risk factor.	identified as highly vulnerable.	
	Landscape	Gently undulating and heavily vegetated landscape with mature hedgerows and many blocks and belts of woodland. Existing landscape expected to absorb most of the visual impacts. Route not visible from any tourist or heritage sites or Clonmel town. Significant number of properties at grade or in areas of embankment within 300m of route.	50 properties within 300m of route, including 1 property located 25m from the carriageway at grade.	Slightly Negative
	Noise	Noise assessment was undertaken in accordance with the NRA "Guidelines for the Treatment of Noise and Vibration in National Road Schemes". These guidelines use the Potential Impact Rating (PIR) for each route as a means of comparison.	50 properties within 300m of mainline. Potential Impact Rating for route is 73. Mitigation measures potentially required for 6 properties for which the design goal noise level may be exceeded.	Moderately Negative
	Socio-Economic	Route will enhance prospects for regional and local economic development, stimulate increased tourist activity in the area and improve accessibility of recreational and cultural facilities. The primary potential impact during construction will be due to temporary road closures and/or diversions during the	No road closures or community severance. Junctions provided with Regional routes for connectivity. Journey times improved.	Moderately Positive

PROJECT APPRAISAL BALANCE SHEET:- EMERGING PREFERRED ROUTE				
Criterion	***Element***	***Qualitative Statement***	***Quantitative statement***	***Scaling Statement***
		construction of the local road bridges. These activities shall be managed to minimise local impacts.		
Safety	***Accidents***	Reduced number and severity of accidents due to improved standard of new road. Accident estimates compared for historical rates for existing road and statistical rates for Type 2 dual carriageway (new road)	Estimated Accident Rates: Do-Minimum = 8.8/year With Scheme = 7.7/year Estimated Fatality Rate: Do Minimum = 0.82/year With Scheme = 0.52/year	Moderately Positive
	Security	Existing N24 route being bypassed should become more user friendly for pedestrians and cyclists due to the significant reduction in motorised traffic along that route		Moderately Positive
Economy	***Effectiveness / Efficiency***	Economic benefits due to reduced journey times, vehicle operating costs and accident costs.	Option Cost Estimate = €88.71m	Moderately Positive
	Other			

PROJECT APPRAISAL BALANCE SHEET:- EMERGING PREFERRED ROUTE				
Criterion	***Element***	***Qualitative Statement***	***Quantitative statement***	***Scaling Statement***
Accessibility & Social Inclusion	***Vulnerable Groups***	Removal of N24 through traffic from the Clonmel Ring Road will improve accessibility and provide opportunities for the further development of public transport and pedestrian/cyclist facilities along the Ring Road and within the town itself.		Moderately Positive
	Deprived Areas			
Integration	***Transport***	Facilitate improved access between strategic locations in the south-east and mid-west regions including Shannon International and Waterford Regional Airport, Rosslare Europort, Port of Waterford, Shannon Foynes Port.		Slightly Positive
	Land Use	Proposal is compatible with national, regional and local plans.		Slightly Positive
	Geographical	Improvement of inter-regional access between the Waterford City Gateway and the Limerick Shannon Gateway, and access to the county town of Clonmel.		Slightly Positive
	Other	Consistent with the objectives of the current National Development Plan.		Slightly Positive

PROJECT APPRAISAL BALANCE SHEET:- ALTERNATIVE ROUTE 1				
Criterion	***Element***	***Qualitative Statement***	***Quantitative statement***	***Scaling Statement***
Environment	***Agricultural***	Large number of land parcels impacted including a high level of good quality land parcels. Main land use affected is grassland. Low instance of major land severance and low instance of no land severance.	18 land holdings impacted, of which 9 are severed. Severance to stud farm and other holdings mitigated by alignment along boundaries.	Slightly Negative
	Air Quality	Route is in Air Quality Zone D. Concentrations of NO_2, PM_{10} and NO_x will remain significantly below the limiting values for zone type. No sensitive ecosystems impacted.	Index of Overall Change in Exposure – 15,365 kg/km/yr NO_2 – 461 kg/km/yr PM_{10} measured for a corridor of 100m from the mainline.	Moderately Negative
	Archaeology	There are no identified registered monuments, sites in ownership or guardianship, preservation orders, or protected structures, within the study area. No RMP Sites directly impacted.	No RMP Sites directly impacted 3 RMP Site indirectly impacted. 20 other potential sites identified within corridor. 6 of these directly impacted (1 moderate, 5 slight)	Moderately Negative
	Biodiversity & Ecology	The land crossed by the route is primarily agricultural pastureland, with some areas of tillage and arable land. Field systems are extensive and bounded by mature hedgegrows and / or treelines.	Route crosses mature woodland along dismantled railway line at Moanroe These woodlands considered to be of high ecological importance and have potential as bat roosts. Railway embankments are ideal locations for badger setts. Potential indirect impacts due to location upstream of salmonid stream and calcareous spring.	Moderately Negative

PROJECT APPRAISAL BALANCE SHEET:- ALTERNATIVE ROUTE 1				
Criterion	***Element***	***Qualitative Statement***	***Quantitative statement***	***Scaling Statement***
	Geology & Hydrogeology	The route corridor is within an aquifer area classified as 'Regionally Important'. Route examined with regard to interface with identified and mapped levels of aquifer vulnerability to estimate relative risk factor.	0.6km of cutting within aquifer area identified as extremely vulnerable. 1.4km of cutting within aquifer area identified as highly vulnerable.	Moderately Negative
	Landscape	Gently undulating and heavily vegetated landscape with mature hedgerows and many blocks and belts of woodland. This existing landscape expected to absorb most of the visual impacts. Route not visible from any tourist or heritage sites or Clonmel town. Significant number of properties at grade or in areas of embankment within 300m of route.	63 properties within 300m of route.	Moderately Negative
	Noise	Noise assessment was undertaken in accordance with the NRA "Guidelines for the Treatment of Noise and Vibration in National Road Schemes". These guidelines use the Potential Impact Rating (PIR) for each route as a means of comparison.	63 properties within 300m of mainline. Potential Impact Rating for route is 89. Mitigation measures potentially required for 6 properties for which the design goal noise level may be exceeded.	Moderately Negative
	Socio-Economic	Route will enhance prospects for regional and local economic development, stimulate increased tourist activity in the area and improve accessibility of recreational	One road closures proposed though this is not expected to result in any level of community severance. Junctions provided with Regional routes for	Moderately Positive

PROJECT APPRAISAL BALANCE SHEET:- ALTERNATIVE ROUTE 1				
Criterion	***Element***	***Qualitative Statement***	***Quantitative statement***	***Scaling Statement***
		and cultural facilities. The primary potential impact during construction will be due to temporary road closures and/or diversions during the construction of the local road bridges. These activities shall be managed to minimise local impacts.	connectivity. Journey times improved.	
Safety	***Accidents***	Reduced number and severity of accidents due to improved standard of new road. Accident estimates compared for historical rates for existing road and statistical rates for Type 2 dual carriageway (new road)	Estimated Accident Rates: Do-Minimum = 8.8/year With Scheme = 7.7/year Estimated Fatality Rate: Do Minimum = 0.82/year With Scheme = 0.52/year	Moderately Positive
	Security	Existing N24 route being bypassed should become more user friendly for pedestrians and cyclists due to the significant reduction in motorised traffic along that route		Moderately Positive
Economy	***Effectiveness / Efficiency***	Economic benefits due to reduced journey times, vehicle operating costs and accident costs.	Option Cost Estimate = €92.52m	Moderately Positive
	Other			

PROJECT APPRAISAL BALANCE SHEET:- ALTERNATIVE ROUTE 1				
Criterion	***Element***	***Qualitative Statement***	***Quantitative statement***	***Scaling Statement***
Accessibility & Social Inclusion	***Vulnerable Groups***	Removal of N24 through traffic from the Clonmel Ring Road will improve accessibility and provide opportunities for the further development of public transport and pedestrian/cyclist facilities along the Ring Road and within the town itself.		Moderately Positive
	Deprived Areas			
Integration	***Transport***	Facilitate improved access between strategic locations in the south-east and mid-west regions including Shannon International and Waterford Regional Airport, Rosslare Europort, Port of Waterford, Shannon Foynes Port.		Slightly Positive
	Land Use	Proposal is compatible with national, regional and local plans.		Slightly Positive
	Geographical	Improvement of inter-regional access between the Waterford City Gateway and the Limerick Shannon Gateway, and access to the county town of Clonmel.		Slightly Positive
	Other	Consistent with the objectives of the current National Development Plan.		Slightly Positive

PROJECT APPRAISAL BALANCE SHEET:- ALTERNATIVE ROUTE 2				
Criterion	***Element***	***Qualitative Statement***	***Quantitative statement***	***Scaling Statement***
Environment	***Agricultural***	Large number of land parcels impacted including a high level of good quality land parcels. Main land use affected is grassland. Low instance of major land severance and low instance of no land severance.	18 land holdings impacted, of which 10 are severed. Severance to stud farm and other holdings mitigated by alignment along boundaries.	Slightly Negative
	Air Quality	Route is in Air Quality Zone D. Concentrations of NO_2, PM_{10} and NO_x will remain significantly below the limiting values for zone type. No sensitive ecosystems impacted.	Index of Overall Change in Exposure – 12,804 kg/km/yr NO_2 – 384 kg/km/yr PM_{10} measured for a corridor of 100m from the mainline.	Moderately Negative
	Archaeology	There are no identified registered monuments, sites in ownership or guardianship, preservation orders, or protected structures, within the study area. No RMP Sites directly impacted.	No RMP Sites directly impacted 3 RMP Site indirectly impacted. 19 other potential sites identified within corridor. 3 of these directly impacted (1 moderate, 2 slight)	Moderately Negative
	Biodiversity & Ecology	The land crossed by the route is primarily agricultural pastureland, with some areas of tillage and arable land. Field systems are extensive and bounded by mature hedgegrows and / or treelines.	No direct impact on identified sites of ecological importance within study area. Potential indirect impacts due to location upstream of salmonid stream and calcareous spring.	Slightly Negative
	Geology & Hydrogeology	The route corridor is within an aquifer area classified as 'Regionally Important'. Route examined with regard to interface with identified and mapped levels of aquifer vulnerability to estimate relative risk factor.	0.4km of cutting within aquifer area identified as extremely vulnerable. 1.7km of cutting within aquifer area identified as highly vulnerable.	Moderately Negative

PROJECT APPRAISAL BALANCE SHEET:- ALTERNATIVE ROUTE 2				
Criterion	***Element***	***Qualitative Statement***	***Quantitative statement***	***Scaling Statement***
	Landscape	Gently undulating and heavily vegetated landscape with mature hedgerows and many blocks and belts of woodland. This existing landscape expected to absorb most of the visual impacts. Route not visible from any tourist or heritage sites or Clonmel town. Significant number of properties at grade or in areas of embankment within 300m of route.	49 properties within 300m of route.	Slightly Negative
	Noise	Noise assessment was undertaken in accordance with the NRA "Guidelines for the Treatment of Noise and Vibration in National Road Schemes". These guidelines use the Potential Impact Rating (PIR) for each route as a means of comparison.	49 properties within 300m of mainline. Potential Impact Rating for route is 68. Mitigation measures potentially required for 5 properties for which the design goal noise level may be exceeded.	Moderately Negative
	Socio-Economic	Route will enhance prospects for regional and local economic development, stimulate increased tourist activity in the area and improve accessibility of recreational and cultural facilities. The primary potential impact during construction will be due to temporary road closures and/or diversions during the construction of the local road bridges. These activities shall be managed to minimise local impacts.	No road closures or community severance. Junctions provided with Regional routes for connectivity. Journey times improved.	Moderately Positive

PROJECT APPRAISAL BALANCE SHEET:- ALTERNATIVE ROUTE 2				
Criterion	***Element***	***Qualitative Statement***	***Quantitative statement***	***Scaling Statement***
Safety	***Accidents***	Reduced number and severity of accidents due to improved standard of new road. Accident estimates compared for historical rates for existing road and statistical rates for Type 2 dual carriageway (new road)	Estimated Accident Rates: Do-Minimum = 8.8/year With Scheme = 7.7/year Estimated Fatality Rate: Do Minimum = 0.82/year With Scheme = 0.52/year	Moderately Positive
	Security	Existing N24 route being bypassed should become more user friendly for pedestrians and cyclists due to the significant reduction in motorised traffic along that route		Moderately Positive
Economy	***Effectiveness / Efficiency***	Economic benefits due to reduced journey times, vehicle operating costs and accident costs.	Option Cost Estimate = €88.00m	Moderately Positive
	Other			
Accessibility & Social Inclusion	***Vulnerable Groups***	Removal of N24 through traffic from the Clonmel Ring Road will improve accessibility and provide opportunities for the further development of public transport and pedestrian/cyclist facilities along the Ring Road and within the town itself.		Moderately Positive
	Deprived Areas			

PROJECT APPRAISAL BALANCE SHEET:- ALTERNATIVE ROUTE 2				
Criterion	***Element***	***Qualitative Statement***	***Quantitative statement***	***Scaling Statement***
Integration	***Transport***	Facilitate improved access between strategic locations in the south-east and mid-west regions including Shannon International and Waterford Regional Airport, Rosslare Europort, Port of Waterford, Shannon Foynes Port.		Slightly Positive
	Land Use	Proposal is compatible with national, regional and local plans.		Slightly Positive
	Geographical	Improvement of inter-regional access between the Waterford City Gateway and the Limerick Shannon Gateway, and access to the county town of Clonmel.		Slightly Positive
	Other	Consistent with the objectives of the current National Development Plan.		Slightly Positive

PROJECT APPRAISAL BALANCE SHEET:- HYBRID ROUTE				
Criterion	***Element***	***Qualitative Statement***	***Quantitative statement***	***Scaling Statement***
Environment	***Agricultural***	Large number of land parcels impacted including a high level of good quality land parcels. Main land use affected is grassland. Low instance of major land severance and low instance of no land severance.	17 land holdings impacted, of which 12 are severed. Reduced severance to stud farm compared to 2006 EPR.	Moderately Negative
	Air Quality	Route is in Air Quality Zone D. Concentrations of NO_2, PM_{10} and NO_x will remain significantly below the limiting values for zone type. No sensitive ecosystems impacted.	Index of Overall Change in Exposure – 7,682 kg/km/yr NO_2 – 230 kg/km/yr PM_{10} measured for a corridor of 100m from the mainline.	Slightly Negative
	Archaeology	There are no identified registered monuments, sites in ownership or guardianship, preservation orders, or protected structures, within the study area. No RMP Sites directly impacted.	No RMP Sites directly impacted 2 RMP Site indirectly impacted. 18 other potential sites identified within corridor. 3 of these directly impacted (1 moderate, 2 slight)	Moderately Negative
	Biodiversity & Ecology	The land crossed by the route is primarily agricultural pastureland, with some areas of tillage and arable land. Field systems are extensive and bounded by mature hedgegrows and / or treelines.	No direct impact on identified sites of ecological importance within study area. Runs close to two of these sites, the riparian woodland habitat at 'Halfpenny Wood' and the existing stream crossing at 'Halfpenny Bridge', but avoids the direct impact that the 2006 EPR imposes on the sites.	Slightly Negative
	Geology & Hydrogeology	The route corridor is within an aquifer area classified as 'Regionally Important'. Route examined with	0.2km of cutting within aquifer area identified as extremely vulnerable. 1.2km of cutting within	Slightly Negative

PROJECT APPRAISAL BALANCE SHEET:- HYBRID ROUTE				
Criterion	***Element***	***Qualitative Statement***	***Quantitative statement***	***Scaling Statement***
		regard to interface with identified and mapped levels of aquifer vulnerability to estimate relative risk factor.	aquifer area identified as highly vulnerable.	
	Landscape	Gently undulating and heavily vegetated landscape with mature hedgerows and many blocks and belts of woodland. This existing landscape expected to absorb most of the visual impacts. Route not visible from any tourist or heritage sites or Clonmel town. Significant number of properties at grade or in areas of embankment within 300m of route.	49 properties within 300m of route.	Slightly Negative
	Noise	Noise assessment was undertaken in accordance with the NRA "Guidelines for the Treatment of Noise and Vibration in National Road Schemes". These guidelines use the Potential Impact Rating (PIR) for each route as a means of comparison.	42 properties within 300m of mainline. Potential Impact Rating for route is 54. Mitigation measures potentially required for 3 properties for which the design goal noise level may be exceeded.	Slightly Negative
	Socio-Economic	Route will enhance prospects for regional and local economic development, stimulate increased tourist activity in the area and improve accessibility of recreational and cultural facilities. The primary potential impact during construction will be due to temporary road	No road closures or community severance. Junctions provided with Regional routes for connectivity. Journey times improved.	Moderately Positive

PROJECT APPRAISAL BALANCE SHEET:- HYBRID ROUTE				
Criterion	***Element***	***Qualitative Statement***	***Quantitative statement***	***Scaling Statement***
		closures and/or diversions during the construction of the local road bridges. These activities shall be managed to minimise local impacts.		
Safety	***Accidents***	Reduced number and severity of accidents due to improved standard of new road. Accident estimates compared for historical rates for existing road and statistical rates for Type 2 dual carriageway (new road)	Estimated Accident Rates: Do-Minimum = 8.8/year With Scheme = 7.7/year Estimated Fatality Rate: Do Minimum = 0.82/year With Scheme = 0.52/year	Moderately Positive
	Security	Existing N24 route being bypassed should become more user friendly for pedestrians and cyclists due to the significant reduction in motorised traffic along that route		Moderately Positive
Economy	***Effectiveness / Efficiency***	Economic benefits due to reduced journey times, vehicle operating costs and accident costs.	Option Cost Estimate = €89.34m	Moderately Positive
	Other			

PROJECT APPRAISAL BALANCE SHEET:- HYBRID ROUTE				
Criterion	***Element***	***Qualitative Statement***	***Quantitative statement***	***Scaling Statement***
Accessibility & Social Inclusion	***Vulnerable Groups***	Removal of N24 through traffic from the Clonmel Ring Road will improve accessibility and provide opportunities for the further development of public transport and pedestrian/cyclist facilities along the Ring Road and within the town itself.		Moderately Positive
	Deprived Areas			
Integration	***Transport***	Facilitate improved access between strategic locations in the south-east and mid-west regions including Shannon International and Waterford Regional Airport, Rosslare Europort, Port of Waterford, Shannon Foynes Port.		Slightly Positive
	Land Use	Proposal is compatible with national, regional and local plans.		Slightly Positive
	Geographical	Improvement of inter-regional access between the Waterford City Gateway and the Limerick Shannon Gateway, and access to the county town of Clonmel.		Slightly Positive
	Other	Consistent with the objectives of the current National Development Plan.		Slightly Positive

11.4 Summary PABS

The following table summarises the PABS analysis under each of the five criteria. For each criterion, the highest scaling received has been shaded.

	Route Options			
	Emerging Preferred Route	**Alternative Route 1**	**Alternative Route 2**	**Hybrid Route**
Environment	Moderately Negative	Moderately Negative	Moderately Negative	Slightly Negative
Safety	Moderately Positive	Moderately Positive	Moderately Positive	Moderately Positive
Economy	Moderately Positive	Moderately Positive	Moderately Positive	Moderately Positive
Accessibility	Moderately Positive	Moderately Positive	Moderately Positive	Moderately Positive
Integration	Slightly Positive	Slightly Positive	Slightly Positive	Slightly Positive

The closely matched scaling of the route options for each of the criteria reflects the relatively small scope of the study area and the localised scale of the differences in the alignments and characteristics of the route corridors. This is particularly evident in the equal scaling given to each of the route options in the final four criteria. The route options have similar road types, junctions, length and construction, impact on the same local communities and adhere to the same local, regional and national policies. The more positive scaling achieved by the 'Hybrid Route' in the environmental criterion corresponds with the comparative assessment of the routes undertaken in sections 4 and 5 above. The critical factor in this higher scaling is the significantly fewer number of sensitive properties in proximity to the route, which influence the reduced air quality, noise and visual impacts.

From the summary PABS assessment it can be seen that the hybrid route achieves the more positive assessment rating, and is therefore selected as the preferred option for the scheme.

12 CONCLUSIONS & RECOMMENDATIONS

The following conclusions and recommendations are made:-

- This report was prepared in accordance with the National Roads Authority's 'Project Management Guidelines' and 'Project Appraisal Guidelines'.
- The 'Hybrid Route' as identified and described above, should be adopted as the preferred route for the scheme having achieved the most positive assessment rating in the Project Appraisal process.
- The localised alteration at Newchapel as described in section 10 above, and arising out of the public consultation process should be incorporated into the amended preferred route for the scheme.
- The choice of road type for the route shall be consistent with the overall strategic policy for the N24 transport corridor, and is currently envisaged as a Type 2 dual carriageway. The final decision on road type shall be subject to economic appraisal at design stage.
- This report should be presented to local authority representatives for further consideration and be presented in a public forum prior to formal adoption.
- Subject to its progress through the above stages, this report should be incorporated as an addendum to the Route Selection Report and submitted for formal approval to the NRA.
- Subject to the completion of the above procedures and the prior approval of the National Roads Authority, the new preferred route should be advanced to the preliminary design stage. By virtue of its proposed cross section and length, such a scheme comes under the category of prescribed road development that requires an Environmental Impact Statement.

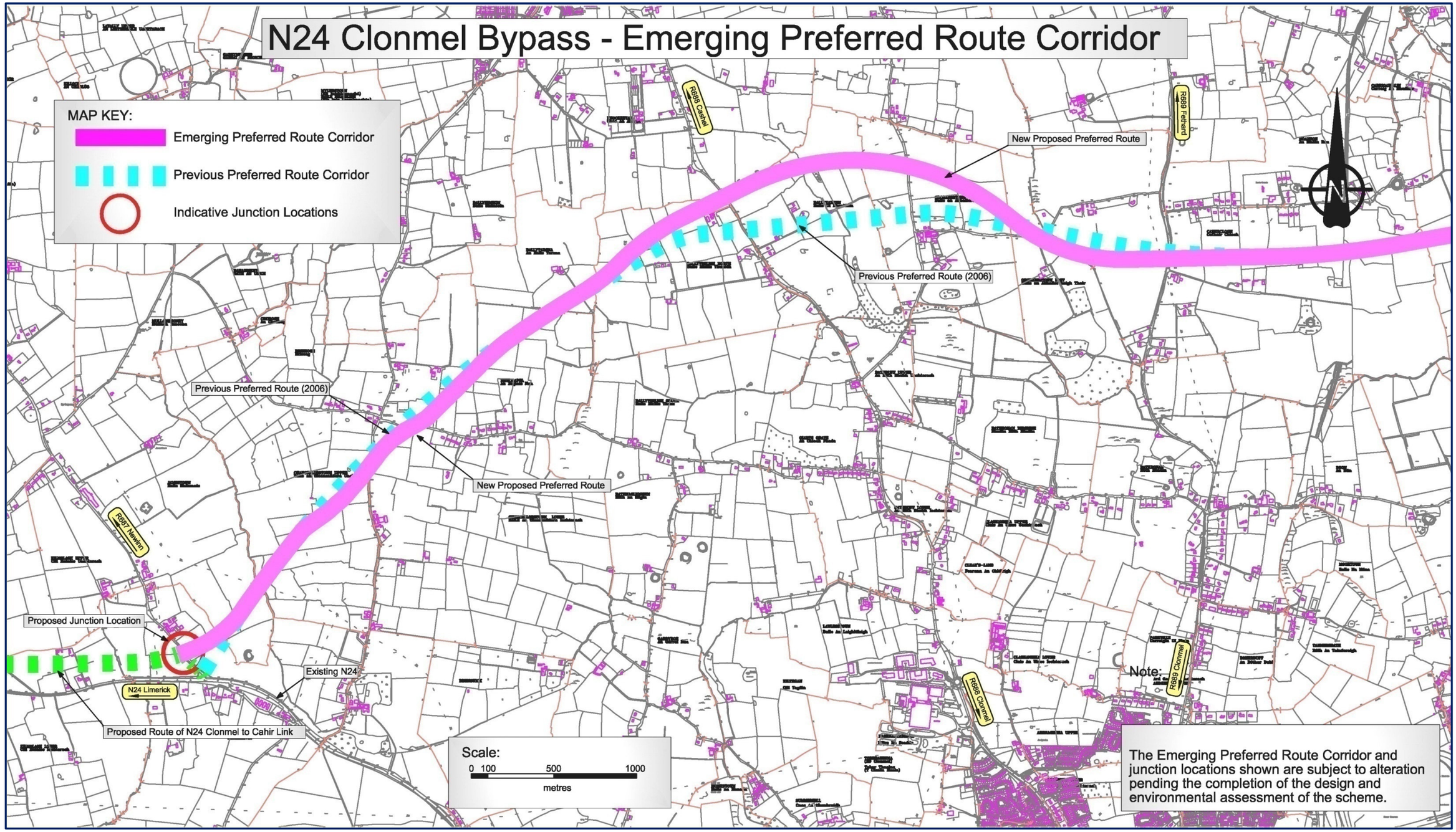

FIGURE 13: PREFERRED ROUTE CORRIDOR (LAYOUT 1 OF 2)

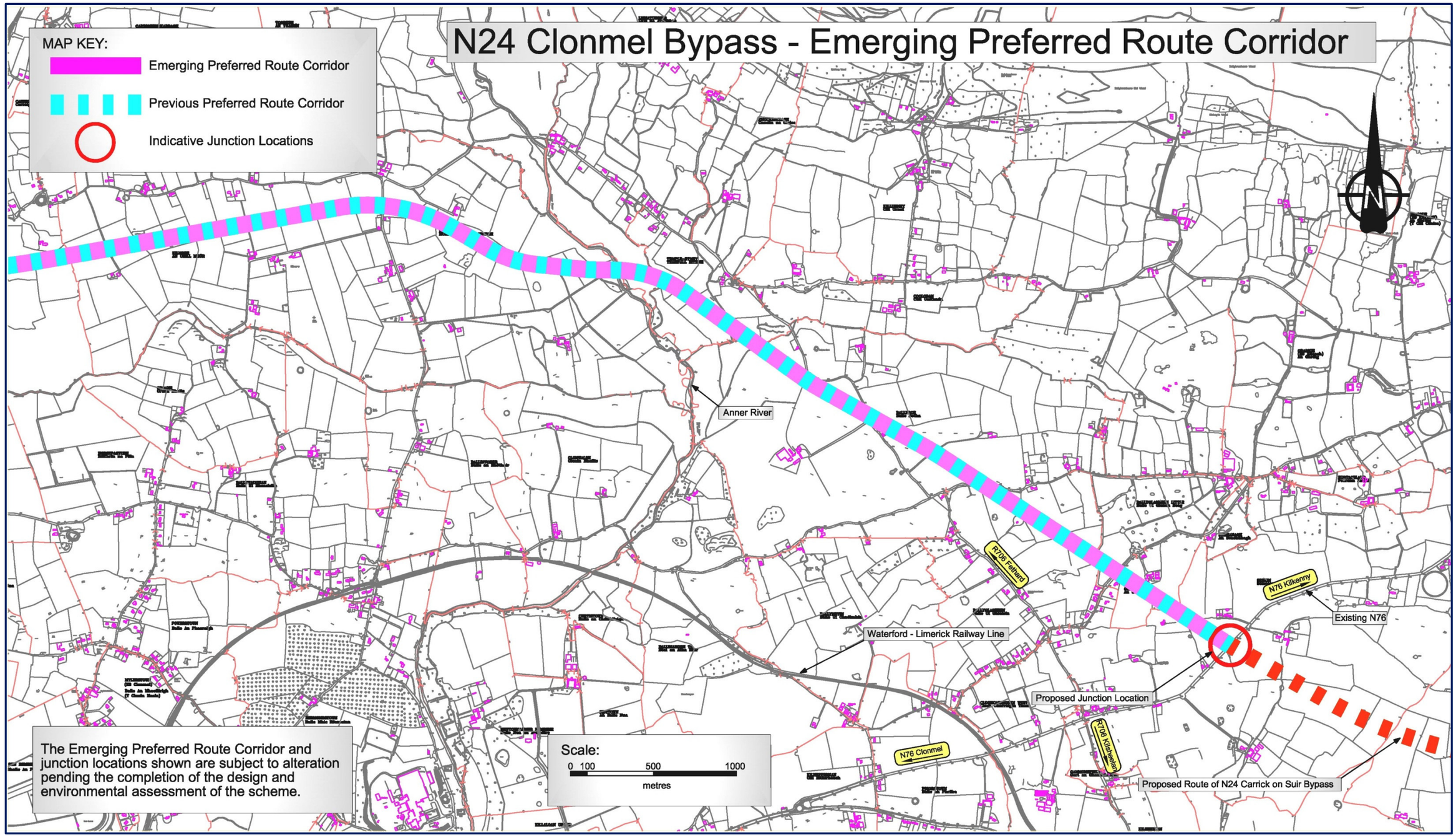

FIGURE 14: PREFERRED ROUTE CORRIDOR (LAYOUT 2 OF 2)

APPENDICES

APPENDIX A

ENVIRONMENTAL ROUTE COMPARISON REPORTS

APPENDIX A.1

AGRICULTURAL

APPENDIX A.1.1

AGRICULTURAL ROUTE COMPARISON REPORT

ROUTE COMPARISON REPORT

ON

N24 CLONMEL BYPASS SCHEME

EFFECT ON AGRICULTURE

PRESENTED BY

PHILIP FARRELLY & PARTNERS

CONTENTS

1. Introduction

The construction of the proposed N24 Western Clonmel Bypass road scheme passes through agricultural land and will therefore have an impact on agriculture in the area.

All of the three proposed routes physically affect the surrounding area in the following ways:

- passes through agricultural land;
- causes severance of farms;
- causes disturbance to farming activities;
- reduces the agricultural land area; and/or
- causes access problems to land.

The level and severity of this impact varies between farms and between proposed routes. This report compares the route options with regard to agriculture rather than the effect on individual farmers.

The approximate area of land taken by the proposed route is outlined in Table 1 below.

Table 1. Approximate area of land taken by the proposed by-pass

	Area of agricultural land required to accommodate the road (hectares)**	No. of farmers along route	Length of route (km)
Magenta Route	**62.3**	**34**	**17.80**
Cyan Route	**60.9**	**35**	**17.40**
Red Route	**59.5**	**36**	**17.00**

Note: The routes are referenced as routes Magenta, Cyan and Red to Cyan as per those the colours displayed in drawing number CL/RS/01 for N.R.A Project Number TS/04/270

* Does not include farms whose access only is affected.

** Assumes an average width of land take along each route to be 35 meters for the full length of the route.

The agricultural land through which the proposed routes pass is good. The majority of all lands along all proposed routes is good to excellent quality. There are very few areas where the lands are not suitable for tillage although less than 50% of the lands through which the proposed routes travel is used for tillage. As a consequence the land would have a high agricultural production value.

Almost all land farmed is under either continuous grassland pastures or is part of tillage rotations. In the areas of tillage, winter and spring cereals will be the main crops affected. There are some areas with reasonably high water-tables along all proposed routes mainly where the proposed routes pass over water bearing drainage channels. These lands are good grazing land but may be of restricted use as tillage ground. Some lands would be susceptible to occasional flooding.

The area is characterised by differing sizes of fields. Fields are reasonably large in most areas along each of the routes. The lands would generally have been well managed and intensively farmed down through the years and fields are generally separated by good quality and regularly managed hedgerows, and earthen banks.

The information in this report is based on roadside inspections of the proposed routes along with the use of aerial photography and a limited amount of land folio details. Inspections were carried out during December 2005 and January of 2006. Our professional opinion was used in an effort to define farm boundaries and farming systems in some cases.

The accuracy of some of the information is limited to a certain degree. An exact report would have been possible had all farm boundaries been available to us at the time. It is also more difficult to ascertain the exact farm use in some cases at the time that the roadside inspections were carried out. On most livestock farms the animals are housed at this time and it is sometimes difficult to distinguish between a dairy farm and a beef farm that has a well developed pad docked grazing system at this time of year from a roadside inspection.

2. Agriculture in the N 24 Clonmel bypass Area

The agricultural enterprises along the length of the proposed routes are primarily beef, tillage and dairy farms. A small number of dairy farms concentrate exclusively on milk production. Other farms would have dairy farming as their main source of income but would also rear to beef some or all progeny born on the farm or have other mixes of enterprise as well as dairying.

There are also some suckle farmers in the area. beef production and mixed beef and sheep production is popular on some of the areas under permanent pasture. There are a number of tillage farmers and blood-stock farmers in the area also. Some farms combine a mixture of two or more of the above enterprises

Agriculture has declined in employment importance in recent years with the percentage of people at work in this sector falling. Even given this fall in the percentage of those employed, the agricultural sector remains extremely important.

With sales prices for farm output remaining relative static over the past number of years and inflationary costs eating into profits, A lot of farmers have been forced to farm on a part time basis, and work off farm to supplement their income. This has been particularly the case in smaller non dairying farms. Farm holdings vary a lot in size with a high proportion of large farms in the area. In the areas through which the proposed roadways pass will contain a proportion of part time farmers especially those involved in beef / sheep production or in smaller scale tillage operations.

3. Soils in the Path of the Proposed Routes

The soils in the area fall within three soil associations, they are:

- **Association No. 13** Acid Brown earths 70%, Grey–Brown Podzolics 15%,.Gleys 15%
- **Association No. 34:** Grey Brown Podzolics 70%, Gleys 20%, Brown Earths 10%;

- **Association No. 43:** Gleys 60%, Brown Earths 20%, Peaty Gleys 20%.

Soil Association 34 is located in excess of 70 % of the lands through which the proposed routes pass. This covers the areas from where the proposed routes commence (at the junction of the N 24 Clonmel to Cahir road with the R687 Clonmel to New Inn road) through to where the Proposed Magenta and Red/Cyan route intersect in the vicinity of Mullenaranky. From this point to where the proposed routes cross the R 706 the lands are part of Soil association number 43. From the R 706 to where the proposed routes meet with the proposed Cahir bypass the proposed roads travel through Soil Association 13.

*** Soil Association 13: Acid Brown Earths 70%, Grey Brown Podzolics 15%, Gleys 15%**

This soil association occurs in the gently rolling valleys of Cork and Waterford in particular and also in south Tipperary. Topography is gently rolling and elevations are mainly 0 – 75m O.D. The soils are formed from glacial drift of mixed Old Red Sandstone-Carboniferous limestone composition while the underlying rock is Carboniferous limestone. The principal soil is a well-drained Acid Brown Earth of sandy loam texture throughout the profile depth. Moisture holding capacity is good. The associated Grey Brown Podzolic (15%) soils occur where there is a stronger limestone influence in the parent material. In the low-lying areas, Gley soils occur within this association but are limited in extent. Impedance is usually evident from 230cm downwards but as textures are sandy loam to loam; these areas can be readily drained if an outfall is available.

These soils have a wide use range and are very suitable for both tillage and grass production. Because of their sandy loam texture, free drainage and good structure, they are easy to cultivate and can produce a wide range of crops, including malting barley and sugar beet. The climatic advantages of their southern location increase both crop and pasture yields

*** Soil Association 34 Grey–Brown Podzolics 70%, Gleys 20%, Brown Earths 10%**

This soil association occurs widely in the limestone areas of the country but especially in the Tipperary, Limerick, Kilkenny, Laois, Offaly and Kildare areas. The soil parent material consists of glacial till of predominantly Carboniferous limestone composition. In places there is a small mixture of sandstone, shale or volcanic materials. The predominant soil is a well-drained Grey–Brown Podzolic of loamy texture and of high base status. These are deep soils where the combined dept of the A and B horizons are at least 75 centimetres.

These soils have a wide use range. They are mainly free draining with a good moisture-holding capacity. They are first-class grassland soils. Although more noted as grassland soils they are also suitable for cereals and root crops. Though they can be used for most cereal and root crops giving good yields but are not suited to malting barley as they are slightly heavy for this purpose and are not likely to produce good quality grain for malting.

The topography is gently undulating with gentle slopes.

*** Soil Association 43 Gleys 60%, Brown Earths 20%, Peaty Gleys 20%.**

This soil association occurs 1.33% of the country. They are formed from alluvial deposits and occur mainly in harbour areas in Wexford. Donegal and Wicklow. The topography of the land is flat and low-lying. The soil parent material is mainly of a heavy textured calcareous alluvium. The predominant soil is a poorly drained Gley of silty clay loam texture and of medium to high base status. There is high silt content throughout the soil profile. Inland where these soils occur, they are formed mainly from lake or river alluvium. They are variable in texture and tend to be stratified. They are mostly peaty Gleys and are generally only suitable for grazing. They can however be brought into good use where arterial drainage is feasible.

In many cases where the water table can be controlled, these soils can be used both for tillage crops and grassland production. Where brown earths occur in the association they are suited to a wide range of agricultural crops. Flash flooding can however cause problems.

Conclusion

Having specifically assessed the agricultural land through which the proposed routes pass, land is of good agricultural value. Long-term grassland pastures and tillage rotations account for practically all the land which will be affected by the proposed new roads.

The land ranges from level to undulating and is being used to produce milk and beef and cereal crops. A small proportion of land is devoted to blood-stock production but there are a number of farms where equine production part of a mixed enterprise system.

4. Loss of Agricultural Land

The effect of the agricultural land loss due to the construction of the proposed N24 Clonmel By pass scheme can be looked at under the following two headings:

- Effect on the national farm area; and
- Effect on the local farms.

4.1 Effect on the National Farm Area

The proposed N24 Clonmel By pass scheme results in the loss of approximately 60.8 hectares (average of the three proposed routes). The area of land required for the construction of each proposed route is presented in Table 1. The areas of agricultural land which are required for the proposed routes represent an extremely small percentage of the total area of land farmed in Ireland. Based on *Irish Agriculture in Figures* (1997), there are approximately 3,957,500 hectares of agricultural land (excluding rough grazing) in Ireland, of which 3,543,300 hectares are in grassland-based enterprises (excluding rough grazing) and 414,200 hectares of cereal and non-cereal crop production.

The effect from a national agricultural viewpoint is negligible. The area of land to be taken, while significant to individual farms is negligible when considered in relation to the national farm area.

4.2. Effect on the Local Farms

Table 2 presents the number of farms which the proposed routes will affect. The effect is categorised into four different levels (see below).

Table 2. Effect on local farms

	Severe effect	Moderate effect	Minor effect	Access only affected	Total no. of farms*
Magenta Route	**19**	**9**	**6**	**2**	**34**
Cyan Route	**22**	**10**	**3**	**0**	**35**
Red Route	**23**	**7**	**6**	**0**	**36**

Notes:

Serious effect: Proposed route will cut the holding and leave more than 15% of the holding at opposite sides of the roadway.

Moderate effect: Proposed route will cut the holding and leave up to 15% of the holding at one side of the roadway.

Minor effect: Proposed route will take a proportion of the holding but will not segregate the holding.

Access affected: Proposed route will not take land from a particular holding but will have a major bearing on the access to the holding.

* Total number of farms affected does not include farms where the access to the land is taken but no lands will be taken

From Table 2 above it can be seen that the greatest number of farms (36) are affected by the proposed Red to Cyan route, with the proposed Cyan route having the second highest number at 35 and the proposed Magenta Route being lowest at 34. When comparing the route option, the number of farms seriously affected is greatest on the proposed Red to Cyan route, with 23 farms seriously affected, while the proposed Magenta Route has the least number of farms seriously affected, with 19 farms seriously affected.

In compiling the above figures there are a number of farms which will be affected by two or more proposed routes. These are shown in Table 3.

Table 3. Number of farms affected by more than one proposed route

	Total no. of farms	Number of farms affected by two proposed routes	Number of farms affected by three proposed routes
Magenta Route	**34**	**23**	**19**
Cyan Route	**35**	**31**	**19**
Red Route	**36**	**28**	**19**

4.3. Conclusion

4.3.1. National

On a national basis the loss of up to 60.8 hectares (avg.) of agricultural land along the alternative route options would be negligible as the area represents an extremely small area of the national agricultural land bank.

4.3.2. Localised

The localised effect of the proposed by-pass routes while somewhat more significant from an area point of view is none the less negligible as regards to the amount of agricultural land removed.

The loss of this area of land is not the most significant impact; a more important impact is the fragmentation impact of the proposed road scheme. The construction of any new road results in the segmentation of some farms. The degree of the severance is a function of the inconvenience caused to the farming operation; this issue should be dealt with more specifically on a farmer-by-farmer basis in individual farm reports at final route selection stage. However, in summary of the above tables with reference to the impact of the proposed route options on agricultural holdings in the areas affected. The proposed Red to Cyan Route affects the largest number of farmer's. This route also causes severe segregation of the largest number of farm holdings. The proposed Magenta Route affects the least number of farmers, and has the least number of seriously affected farmers (34).

5. Quantification of Agricultural Impact

The proposed Clonmel by pass scheme will have an effect on the agricultural activity in the surrounding area. The agricultural impact can be classified under four different headings, they are:

- Agricultural land lost to the road construction;
- Severance of farms where the road passes through the farms;
- Remedial works required to reduce the negative impact; and
- Unproductive land remaining outside the path of the proposed routes.

To accommodate the construction of any proposed route requires an area of agricultural land along the proposed route to accommodate both the road itself and also the cutting, filling and construction activities.

The total area of agricultural land which would be required for the construction of the proposed Clonmel By pass scheme is approximately 60.8 hectares (average).

The agricultural land through which the proposed routes pass is good to excellent. As a consequence most land would have a high agricultural production value. Almost all land farmed is under continuous grassland pastures or tillage. In some areas, low-lying land with high water-tables restricts farming practices to grassland production.

5.1 Proposed Routes (Summary and Descriptions)

The proposed routes will now be analysed and described in more detail.

5.1.1. Proposed Magenta Route

(A) Executive summary

Route Length:	Approx. 17.8 km
Number of Land Owners:	34

Land to be Acquired:	Approx. 62.3 hectares ([1])
Approximate Number of Farms Seriously Severed:	19
Approximate Number of Farms Moderately Severed:	9

(B) Route Description

The proposed route starts approx. 4 km North West of Clonmel Town It commences at the junction of the N 24 Cahir to Clonmel road with the R 687 Clonmel to New inn road

The proposed road travels northwards for approximately 2.2 kilometres before turning eastwards. The road crosses number of tertiary roads between these two points. The land is quite level sloping gently towards a water channel after 0.8 kilometres and rising gently again from this to where the proposed road turns east. The quality of the land is good. Soils are free draining and are productive. The area of land adjoining the water channel is slightly wetter in nature.

Fields are quite large in size at first with some fields of 15 to 20 hectares in size. The generally are smaller as one progresses along northwards generally been below 10 hectares in size. Almost all fields are in permanent grassland farms that are used for dairying and beef. There are also some equine enterprises on some of the farms affected by the proposed route.

The road then travels east north-eastwards for approximately 7.8 kilometres at which point it veers in a south eastern direction. The land is undulating, rising and falling gently. The quality of the land is good. Soils are free draining and are productive. Fields are again quite large in size at first with some fields of 15 to 20 hectares in size.

In the stretch between where the proposed road first turns east and where it crosses the Clonmel to Cashel R688 the land is again permanent grassland. It is used mainly for beef production.

From where the proposed road crosses the Clonmel to Cashel R688 approximate 5 kilometres from where it commences to where it veers south eastwards there are a mixture of different enterprise types. Tillage and equine production is the 2.5 kilometre stretch from the 5 kilometre mark to the 7.5 kilometre mark. From here to the 10 kilometre mark there are a number of dairy, beef and tillage / equine enterprises. Fields are quite large in size at where the land is tilled. There are a number of very large tillage fields in excess of 20 hectares in size. Where the land is used for grassland production the fields are generally smaller. The average is less than 10 hectares in size

From the 10 kilometre mark to where the proposed route finishes the route runs in a south eastern direction. It crosses over the river Anner that is important from drainage to the area. It also crosses a number of secondary roads and tertiary roads. The land is quite level sloping gently towards the Anner River and rising gently after this and then becoming undulating to where the proposed road finishes.

The quality of the land is good. Soils are free draining and are productive. There is a mixed enterprise type along this stretch. The quality of the land is good. Soils are free draining and are productive. The first 1.5 kilometres stretch of this section (between the10 and the 11.5 kilometre mark.) is used for beef production. There are a number of grazing hinterlands of dairy herds severed between the 12.6 and 13 kilometre mark. Beyond this the proposed road travels through a mixture of grassland areas and tillage farms. Predominant enterprises are winter and spring cereal crops in the tillage farms and beef production on the grassland areas.

[1] Assuming average width of land take is 35 m for roadway and margins.

Fields are quite large in size at where the land is tilled. There are a number of very large tillage fields in excess of 20 hectares in size. Where the land is used for grassland production the fields are generally smaller.

(C) Instances of Significant Severances and Other Injurious Affection

Along the course of the proposed Magenta Route, there are 34 farms which are impacted by the route. Of these, 19 farms will have to radically alter their production systems to cope with the possible negative effects of the route.

Of these 19 farms, 4 are dairy or dairy/beef farms, whose grazing hinterland for the dairy herd would be severely impacted upon. This in many cases might force farmers to seriously consider the future of their particular enterprise, given the damage that the proposed route may cause.

Of the remaining 15 farms that will be seriously impacted upon 9 are beef or mixed beef /alternative enterprise farms. 1 is an equine farm and 5 are tillage farms

(D) General Comments

The Magenta Route as proposed would:

- Severs a dairy hinterland in the first 800 meters of the proposed route;
- Interfere with a mixed Beef and Equine and Dairy Equine and Beef enterprises after 1.2 to 2.2 kilometres.
- Cut access to large tract of a farm after 3.5 kilometres;
- Cut access to large tract of a farm after 4.1 kilometres;
- Cut access to a farm residence and yard facilities after 5.5 kilometres;
- Severs an equine farm between the 5.6 and 6.2 kilometre mark
- Cut access to large tract of a farm after 10 kilometres;
- Severs 2 dairy hinterlands after approximately 9 kilometres.
- Interfere with 2 dairy hinterlands after approximately 12.4 kilometres.
- Cut access to residence and yard of a large tillage farm after 13.9 kilometres

5.1.2. Proposed Cyan Route

(A) Executive summary

Route Length:	Approx. 17.4 km
Number of Land Owners:	35
Land to be Acquired:	Approx. 60.9 hectares ([2])
Approximate Number of Farms Seriously Severed:	22
Approximate Number of Farms Moderately Severed:	10

(B) Route Description

The proposed route starts approx. 4 km North West of Clonmel Town It commences at the junction of the N 24 Cahir to Clonmel road with the R 687 Clonmel to New inn road

[2] Assuming average width of land take is 35 m for roadway and margins.

The proposed road travels northwards eastwards for approximately 3.8 kilometres before turning eastwards. The road crosses number of tertiary roads between these two points. The land is quite level sloping gently towards a water channel after 0.8 kilometres and rising gently again from this to where the proposed road turns east. The quality of the land is good. Soils are free draining and are productive. The area adjoining the water channel is slightly wetter in nature.

Fields are quite large in size at first with some fields of 15 to 20 hectares in size. The generally are smaller as one progresses along northwards generally been below 10 hectares in size. Almost all fields are in permanent grassland farms that are used for dairying and beef.

The road then travels eastwards for approximately 6.4 kilometres (to the 10.4 kilometre mark) at which point it veers in a south eastern direction. The land is undulating, rising and falling gently. The quality of the land is good. Soils are free draining and are productive. Fields are variable in size but tend to be larger in tillage areas. In the stretch between where the proposed road first turns east and where it crosses the R689 the land use is mixed. Permanent grassland in the area is used for beef and equine production. Over 50% of the land along this stretch of road is used in tillage production.

From where the proposed road crosses the R689 approximate 6.5 kilometres from where it commences to where it veers south eastwards (at the 10.4 kilometre mark) there are a mixture of different enterprise types. Farms are mostly tillage farms. Fields are quite large in size at where the land is tilled. Where the land is used for grassland production the fields are generally smaller. Grassland farms are used for dairy and beef production

From the 10.4 kilometre mark to where the proposed route finishes the route runs generally in a south eastern direction. It crosses over the river Anner that is important from drainage to the area. It also crosses a number of secondary roads and tertiary roads. The land is quite level sloping gently towards the Anner River and rising gently after this and then becoming undulating to where the proposed road finishes.

The quality of the land is good. Soils are free draining and are productive. There is a mixed enterprise type along this stretch. The quality of the land is good. Soils are free draining and are productive. The first 1.5 kilometres of this stretch is used for beef production. There are a number of grazing hinterlands of dairy herds severed between the 12.6 and 12.8 kilometre mark. Beyond this the proposed road travels through a mixture of grassland areas and tillage farms. Predominant enterprises are winter and spring cereal crops in the tillage farms and beef production on the grassland areas. Fields are quite large in size at where the land is tilled. There are a number of very large tillage fields in excess of 20 hectares in size. Where the land is used for grassland production the fields are generally smaller.

(C) Instances of Significant Severances and Other Injurious Affection

Along the course of the proposed Cyan Route, there are 35 farms which are impacted by the route. Of these, 22 farms will have to radically alter their production systems to cope with the possible negative effects of the route.

Of these 22 farms, 4 are dairy or dairy/beef farms, whose grazing hinterland for the dairy herd would be severely impacted upon. This in many cases might force farmers to seriously consider the future of their particular enterprise, given the damage that the proposed route may cause.

Of the remaining 18 farms that will be seriously impacted upon 6 are beef or mixed beef /alternative enterprise farms. 1 is an equine farm and 11 are tillage farms

(D) General Comments

The Cyan Route as proposed would:

- Severs 2 dairy hinterlands in the first 1500 meters of the proposed route;
- Cut access to a dairy hinterland after 2.2 kilometres;
- Cut access to a farm, yard and farmlands after 3.2 kilometres;
- Cut access to large tract of a farm after 3.8 kilometres;
- Cut access to a farm residence and yard facilities after 5.2 kilometres;
- Severs an equine farm between the 5.3 and 5.9 kilometre mark
- Cut access to large tracts of 3 consecutive tillage farms and access to buildings on one farm between the 8.0 and 9.0 kilometres mark.
- Severs a dairy hinterland between the 9.0 and 9.4 kilometres mark.
- Interfere with a dairy hinterland after approximately 11.6 kilometres.
- Cut access to large tract of a farm Between the 12.0 and 12.6 kilometre mark.

5.1.3. Proposed Red to Cyan Route

(A) Executive summary

Route Length:	Approx. 17.0 km
Number of Land Owners:	36
Land to be Acquired:	Approx. 59.5 hectares ([3])
Approximate Number of Farms Seriously Severed:	23
Approximate Number of Farms Moderately Severed:	7

(B) Route Description

The proposed route starts approx. 4 km North West of Clonmel Town It commences at the junction of the N 24 Cahir to Clonmel road with the R 687 Clonmel to New inn road

The proposed road travels in a curve northwards eastwards for approximately 2.5 kilometres before running east north eastwards. The road crosses number of tertiary roads between these two points. The land is quite level sloping gently towards a water channel after 0.8 kilometres and rising gently again from this to where the proposed road turns east north east. The quality of the land is good. Soils are free draining and are productive. The area adjoining the water channel is slightly wetter in nature.

Fields are quite large in size at first with some fields of 15 to 20 hectares in size. The generally are smaller as one progresses along northwards generally been below 10 hectares in size. Almost all fields are in permanent grassland farms that are used for dairying and beef production.

The road then travels east north eastwards for approximately 7.4 kilometres at which point it veers in a south eastern direction at the 10.2 kilometre mark. The land is undulating, rising and falling gently. The quality of the land is good. Soils are free draining and are productive. Fields are variable in size but tend to be larger in tillage areas.

[3] Assuming average width of land take is 35 m for roadway and margins.

In the stretch between where the proposed road first turns east and where it crosses the R688 the land use is mixed. Permanent grassland covers most of the area through which the road passes. It is used for beef and equine production. Less than 20% of the land along this stretch of road is used in tillage production.

In the stretch between where the proposed road crosses the R688 and the R 689 the land use is mixed. Permanent grassland covers less than 50% of the land in this stretch. It is used for beef and equine production. The remaining land along this stretch of road is used in tillage production. Winter and spring cereals are the dominant crops sown.

From where the proposed road crosses the R689 to where it veers south eastwards at the 10.2 kilometre mark, there are a mixture of different enterprise types. Most farms are tillage farms. Fields are quite large in size at where the land is tilled. Some land is used for grassland production. Where this is the case, the fields are generally smaller. Grassland farms are used for dairy and beef production

From the 10.0 kilometre mark to where the proposed route finishes the route runs generally in a south eastern direction. It crosses over the river Anner that is important from drainage to the area. It also crosses a number of secondary roads and tertiary roads. The land is quite level sloping gently towards the Anner River and rising gently after this and then becoming undulating to where the proposed road finishes.

The quality of the land is good. Soils are free draining and are productive. There is a mixed enterprise type along this stretch. The quality of the land is good. Soils are free draining and are productive. The first 1.5 kilometres stretch is used for beef production. There are a number of grazing hinterlands of dairy herds severed between the 12.2 and 12.4 kilometre mark. Beyond this the proposed road travels through a mixture of grassland areas and tillage farms. Predominant enterprises are winter and spring cereal crops in the tillage farms and beef production on the grassland areas. Fields are quite large in size at where the land is tilled. There are a number of very large tillage fields in excess of 20 hectares in size. Where the land is used for grassland production the fields are generally smaller.

(C) Instances of Significant Severances and Other Injurious Affection

Along the course of the proposed Red to Cyan Route, there are 36 farms which are impacted by the route. Of these, 23 farms will have to radically alter their production systems to cope with the possible negative effects of the route.

Of these 23 farms, 3 are dairy or dairy/beef farms, whose grazing hinterland for the dairy herd would be severely impacted upon. This in many cases might force farmers to seriously consider the future of their particular enterprise, given the damage that the proposed route may cause.

Of the remaining 20 farms that will be seriously impacted upon 7are beef or mixed beef /alternative enterprise farms. 1 is an equine farm and 12 are tillage farms

(D) General Comments

The Red to Cyan Route as proposed would:

- Severs 2 dairy hinterlands in the first 1800 meters of the proposed route;
- Severs an equine farm between the 4.2 and 4.6 kilometre mark
- Cut access to large tract of a tillage farm between the 5.6 and 6.2 kilometre mark.

- Cut access to large tracts of 3 consecutive tillage farms and access to buildings on one farm between the 7.6 and 8.6 kilometres mark.
- Severs a dairy hinterland between the 8.6 and 9.0 kilometres mark.
- Interfere with a dairy hinterland after approximately 11.4 kilometres.
- Cut access to large tract of a farm between the 11.8 and 12.4 kilometre mark.

5.2 Farm Severance and Unproductive Areas due to Bypass

In addition to farms being severed a number of fields will suffer a decrease in their utilisable area. The portion retained by the landowner may become less productive following severance due to the remaining area being extremely small and would prove not viable or uneconomical to farm. The severance of a farm is most significant in the case of a dairy farm where animals are moved on a twice daily basis and the inconvenience is less significant on a dry-stock or suckle farm where cattle are not moved as frequently. After construction some of these farms would have increased access difficulty.

Some of these farms are currently let out/leased. Some of the significantly severed farms are dairy farms. The severance of these farms would mean that the dairy enterprise would become less feasible and in one instance will almost certainly result in the farmer ceasing milk production.

The remaining significantly severed farms are involved in livestock production. Severance would make the movement of machinery and livestock more difficult. Difficulty will arise gaining access to a number of plots of land which become landlocked after the construction of the proposed road. Some land would be bounded by a major river on one side and a roadway on the other limiting access.

In addition to land severed by the proposed route there will be a number of extremely small areas of land which will remain after the construction. These will be of little or no agricultural value and occur at a number of points along the proposed route.

5.3. Access Provisions

Access to land holding will need careful consideration. Any farms severed by proposed routes will need access to severed lands to be able to continue to farm the lands. In many cases access might involve providing the farmer with alternative access arrangements or new access gates along existing road frontages. In cases where farmlands will be left severed and land locked, provision of new access roads and / or underpasses may be necessary.

The access that will be provided should be sufficient to allow the farmer to continue to access the lands with all relevant machinery that he presently uses and should not be a limiting factor to his choices of machinery or contractor usage in the aftermath of the road.

5.4. Animal Watering Facilities

Currently animal watering facilities are provided by piped water supply and/or field drains. Following the completion of works animal watering facilities will have to be reinstated to the lands as appropriate and also to the severed sections.

5.5. Animal Handling and Housing Facilities

Following the severance of the land-holdings it would be necessary to provide additional handling facilities to allow the loading of cattle/sheep from the severed farms.

Appendix. Provided below is a summary of the farm types and area affected by each route option in addition to the degree of severance envisaged on farms

	Magenta Route		**Cyan route**		**Red to Cyan Route**	
Estimated no. of holdings	34		35		36	
Route length (km)	17.8		17.4		17	
Total land take (ha)	62.3		60.9		59.5	
Farm types:						
Dairy & dairy / beef	7	20.6 %	5	14.3 %	4	11.1 %
Beef & mixed beef	16	47.0 %	15	42.8 %	15	41.7 %
Tillage	10	29.5 %	14	40.0 %	15	41.7 %
Horses	1	2.9 %	1	2.9 %	2	5.5 %
No. slightly severed	6	17.6 %	3	8.6 %	6	16.7 %
No. moderately severed	9	26.5 %	10	28.6 %	7	19.4 %
No. significantly severed	19	55.9 %	22	62.8 %	23	63.9 %
Access severed only (not included in total no. farms)	2		0		0	
No. holdings where buildings to be removed	0	0	0	0	0	0
No. holdings where houses to be removed	0	0	0	0	0	0

*Does not include farms only affected in their access.

6. Conclusion

Having specifically assessed the agricultural land through which the proposed routes pass, land is of good agricultural value. Long-term grassland pastures and tillage land account for practically all the land which will be affected by the proposed new roads.

The land ranges from level to undulating and is being used to produce milk and beef and cereal crops. A small proportion of land is devoted to blood-stock production,

The greatest numbers of farms (35) are affected by the proposed Red to Cyan Route, with proposed Cyan Route having the second highest number at 35 and the proposed Magenta Route being lowest at 34. When comparing the route option, the number of farms seriously affected is greatest on the proposed Red to Cyan Route, with 23 farms seriously affected, while the proposed Magenta Route has the least number of farms seriously affected, with 19 farms seriously affected.

The land take required for the construction of the route will be largest in the proposed Magenta Route at 62.3 hectares (Assuming an average land take along all routes of 35 meters). The proposed Cyan Route will require 60.9 hectares to construct while the Proposed Red to Cyan route will require least at 59.5 hectares.

The agricultural impact of the proposed routes on individual farmers will depend directly on the degree of severance of their farms coupled with the livestock enterprise on the farm — with dairy farmers being most harshly affected.

The main mitigation issues will be the reinstatement of drinking and handling facilities, access points and gateways and the consequence of small areas of agricultural land left isolated and uneconomical to farm.

On a national basis the loss of up to 60.9 hectares (avg.) of agricultural land along the alternative route options would be negligible as the area represents an extremely small area of the national agricultural land bank.

On both a local and national level, as there are no specialised agricultural enterprises or activities in this area to the best of our knowledge, in general there would be no significant disruption in agriculture as a whole caused by the proposed routes

The localised effect of the proposed by-pass routes while somewhat more significant from an area point of view. It is none the less negligible as regards to the amount of agricultural land removed.

The loss of this area of land is not the most significant impact; a more important impact is the fragmentation impact of the proposed road scheme. The construction of any new road results in the segmentation of some farms. The degree of the severance is a function of the inconvenience caused to the farming operation; this issue should be dealt with more specifically on a farmer-by-farmer basis in individual farm reports at final route selection stage. However, in summary of the above tables with reference to the impact of the proposed route options on agricultural holdings in the areas affected.

The proposed Red to Cyan Route affects the largest number of farmers, and causes severe segregation of the largest number of farm holdings (36). The proposed Magenta affects the least number of farmers (34), while the proposed Cyan Route affects 35 farms. There difference between the numbers of farms affected on each route is not significant in the context of the method of assessment used for our report.

The number of Dairy farms that will suffer from a severe impact is higher in the proposed Magenta and Cyan route at 4 with the proposed Red to Cyan Route is lower at 3. The number of specialist equine facilities suffering from a severe impact by all proposed routes is similar with one such farm been affected in each case. As 19 farms are severed by all 3 proposed routes. These farms will be affected no matter which proposal is

chosen. The option of one above another will be less detrimental to farming operations as far as some of these farms are concerned, but the same option would be more detrimental to other farms along the proposed routes in question.

In our professional opinion all routes should be classified as having a **Negative–Moderate Impact**. There is **no significant difference** between the **impacts of any** of the **three proposed route** on agriculture in the locality. Whichever route is chosen, the final location of the route should be moved in so far as is possible towards farm boundaries to minimise severance and impacts on farms. This is particularly important if there is a general consensus amongst affected landowners that such moves would lessen the impact of the proposed road on agriculture at a local level.

APPENDIX A.1.2

AGRICULTURAL ROUTE COMPARISON REPORT – LETTER OF REVISION

Philip Farrelly & Partners

Agricultural, Environmental & Rural Consultants

Mr. John O Donovan.
Senior Executive Engineer.
Regional Design Office,
Tramore,
Co. Waterford.
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24/7/2006

Re: N24 Clonmel Bypass
Comments on the Agricultural impacts of the proposed alterations to the emerging preferred route (Blue Route) as shown in Drawings no CL/RS/09 Alteration 1 (Dated May 2006) & Drawings no CL/RS/10 Alteration 2 (Dated May 2006).

Dear John

With reference to your request for us to review the alterations proposed to the Emerging preferred route (Blue Route); I have carried out further field work to assess the benefits of alterations to the proposed route to mitigate the damage caused to farms along a particular stretch of the proposed route.

I have looked at these alterations and would like to make the following comments.

In order to minimise disturbance to agriculture, which ever route is chosen, the final location of the route should be moved in so far as is possible towards farm boundaries to minimise severance and impacts on farms. This is particularly important if there is a general consensus amongst affected landowners that such moves would lessen the impact of the proposed road on agriculture at a local level.

The proposed moving of the route northwards has merit when taken in context of reducing the negative effects on the holdings in the vicinity of Orchardstown stud. On this farm and the adjoining farms there would be less land left severed from the main holding and the proposed road would be further away from their respective farmyards. As a result these farms would suffer less injurious affects and disturbance from the proposed moving of the road northwards.

However, though the potential benefits of this action would be positive for the above land owners. The overall positive or negative effects on agriculture of the proposal can only be ascertained when the affect of such a move would have on all landowners. There will be knock on affects further up or down the proposed route as the moving of the route will impact negatively on other landowners.

Both proposed alterations 1 and 2 cause two farms to be impacted upon in the town land of Knockeevan that would not be impacted upon if the proposed road is not moved. Even though the severance of these farms may be minor it adds 2 further farms to the number of farms that will be severed in some way.

If Alteration 2 is chosen a Tillage farm will be impacted upon more severely than it was previous in the townland of Caherlclogh where the proposed alteration swings south eastwards to rejoin the emerging preferred route. (Blue Route).

Proposed alteration 1 will also have similar affects on the 2 farms in Knockeevan as outlined above .It will also cause a number of farms to be impacted upon in the townland of Moanroe that were not part of the original Blue route. On the other hand there would be a number of Caherclogh that are on the proposed blue route that would not be affected if Alteration No 1 were chosen. From an overall perspective there would be little difference in choosing either the Proposed Blue route or Alteration 1 in this stretch.

However there are two dairy farms in the townland of Carrigawillin and Kilmore that would have their grazing hinterland for the dairy herd severely impacted upon by proposed Alteration 1 that would presently be avoided by the Emerging preferred route. (Blue Route). As a result of this the negative effect of proposed alteration 1 would actually be greater than that of the Emerging preferred route. (Blue Route). **Alteration 1 would be the least preferred option of the tree possible options**.

The benefit of Alteration 2 on agriculture can only be ascertained when the positive and negative impacts on all land holdings along the length of route are factored in. There are benefits to some farms due to the proposals but some further farms are severed that would otherwise be avoided. The proposed benefits of Alteration 2 outweigh the negatives especially as it reduces the overall impacts on a Stud farm. **Alteration 2 would be the most preferred option of the tree possible options** as it slightly mitigates the overall negative effects on agriculture**.**

Kind regards.

Pat McMahon
Philip Farrelly and Partners
24/7/2006

APPENDIX A.2

AIR QUALITY

APPENDIX A.2.1

AIR QUALITY ROUTE COMPARISON REPORT

N24 CLONMEL BYPASS

Air Quality
Route Comparison Report

July 2009

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DOCUMENT CONTROL SHEET

Client	South Tipperary County Council
Project Title	N24 Clonmel Bypass
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TABLE OF CONTENTS

LIST OF TABLES

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